

# **How to Reduce Greenhouse Gas Emissions in the Fossil Fuel Industry? A Comparative Analysis of Australian and Norwegian Legislation and Policies**

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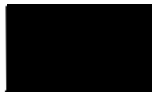
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## ABSTRACT

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This thesis argues for the importance of implementing a carbon tax and an emissions trading scheme (ETS) to reduce greenhouse gas emissions (GHGe) in Australia. It does this by exploring the evolution of climate policies in Norway and Australia. Both countries are major fossil fuel exporters (coal and gas in Australia; oil and gas in Norway) and have Nationally Determined Contributions (NDCs) following the *Paris Agreement 2015 (PA)*. Despite having a shared interest in fossil fuel exploitation, the countries are 'poles apart' in their climate goals and actions. Australia's NDC is to reduce GHGe by '26 to 28 per cent below 2005 levels by 2030'; Norway's NDC is to reduce GHGe by at least 40% below 1990 levels by 2030. Further, Norway has a per capita CO<sub>2</sub> emissions rate that is about one third (8.28 tCO<sub>2</sub> as of 2016) that of Australia (21.5 tCO<sub>2</sub> as of 2016), largely because 95% of its electricity is generated by hydropower while 70% of Australia's electricity is from coal. Australia's GHGe are rising, while Norway has a relatively stable level of emissions, reducing modestly since 2015. Neither country is presently on track to reach its 2030 *PA* targets or to reach net zero emissions by 2050, though it must be acknowledged that Norway has a better record of climate action.

This thesis is a comparative legal examination of the Australian and Norwegian legislation and policies for the regulation of GHGe in the fossil fuel industry. It asks what Australia can learn from Norway as it is doing better in limiting and reducing GHGe. The thesis addresses two particular lines of argument about how to regulate for the reduction of GHGe in the fossil fuel industry. First, it explores the use of a carbon tax and an ETS to impose a price on carbon, contrasting the Australian and Norwegian experiences with these instruments. Secondly, it reviews the regulatory measures implemented to foster renewable energy (RE), especially in the electricity industry, and carbon capture and storage (CCS). It concludes that the Norwegian experience shows that the broad-based pricing of carbon across the economy drives investments in RE and CCS, which supports the argument that Australia should implement a carbon tax and an ETS to achieve its *PA* targets.

The thesis concludes with an important question. To meet the *PA* goal of net zero by 2050, both countries will have to reduce greatly or even terminate their fossil fuel industries and transition to alternative sources of energy. Norway's national oil company, Equinor, is decarbonising its oil and gas production and diversifying its business from fossil fuels to other renewable sources and low-carbon energy solutions. Australia's oil and gas companies are slowly adopting RE strategies and promoting investment in hydrogen fuels but are still focused on oil and gas. Further research is required into what regulatory reforms are needed to transition the fossil fuel industries of both countries to alternative sources of energy.

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## **LIST OF ABBREVIATIONS**

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ACCU – Australian Carbon Credit Unit  
ARENA – Australian Renewable Energy Agency  
CCA – Climate Change Authority  
CCS – carbon capture and storage  
CEA – Clean Energy Act  
CEFC – Clean Energy Finance Corporation  
CEIF – Clean Energy Innovation Fund  
CER – Clean Energy Regulator  
CO<sub>2</sub> – carbon dioxide  
CPM – carbon pricing mechanism  
CPRS – Carbon Pollution Reduction Scheme  
DAP – Direct Action Plan  
EEA – European Economic Area  
ERF – Emissions Reduction Fund  
ETS – emissions trading scheme  
EU – European Union  
EU ETS – European Union Emissions Trading Scheme  
EVs – electric vehicles  
GHGe – greenhouse gas emissions  
KP – Kyoto Protocol  
LNG – liquified natural gas  
LRF – linear reduction factor  
MRET – Mandatory Renewable Energy Target  
MSR – Market Stability Reserve  
NAP – National Action Plan  
NDC – National Determined Contribution  
NEG – National Energy Guarantee  
NEPP – National Energy Productivity Plan  
NGER – National Greenhouse and Energy Reporting  
PA – Paris Agreement  
RE – renewable energy  
RET – Renewable Energy Target  
SM – Safeguard Mechanism  
UNFCCC – United Nations Framework Convention on Climate Change

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---

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## *Introduction*

Are fossil fuel exporting countries on track to meet their *Paris Agreement (PA) 2015*<sup>1</sup> commitments to reduce greenhouse gas emissions<sup>2</sup> (GHGe)? Australia and Norway are two large fossil fuel<sup>3</sup> exporters and it is beneficial to compare their respective policies and performance on GHGe, given the significance of GHGe from fossil fuel extraction, processing, and consumption in both countries. Australia is currently facing significant challenges in reducing GHGe due to rapid growth in the petroleum industry, particularly for exports of Liquefied Natural Gas (LNG). Norway, on the other hand, has designed its policies and measures to reduce GHGe despite being actively involved in the petroleum industry, noting that most GHGe in Norway are from offshore petroleum activities. Major questions remain about whether each country can achieve its *PA* commitments.

The increase of GHGe is causing the Earth's temperature to rise, leading to global warming and climate change. These emissions come from many sectors/sources such as energy (i.e. electricity, stationary energy excluding electricity, transport, and fugitive emissions); industrial processes; agriculture; waste; and land use, land use change and forestry (LULUCF).<sup>4</sup> GHGe in Australia and Norway are an interesting area of comparison; there are valuable lessons that Australia can learn from Norwegian legislation and policies. Australia has more per capita CO<sub>2</sub> emissions than Norway, a rate about 2.6 times that of Norway.<sup>5</sup> This is mainly because Australia has a legacy of coal fired electricity and Norway has a legacy of hydropower electricity.

There are some important similarities between Norway and Australia; such as small populations, stable political systems and economies, major fossil fuel export industries, and both jurisdictions use the licensing and concession system as their regulatory framework for

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<sup>1</sup> *Paris Agreement*, opened for signature 12 December 2015, [2016] ATS 24 (entered into force 09 November 2016).

<sup>2</sup> Greenhouse gases are 'gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and re-emit infrared radiation'. Source: *United Nations Framework Convention on Climate Change 1992*, opened for signature 09 May 1992, 1771 UNTS 107 (entered into force 21 March 1994) ('UNFCCC'), art 1(5). These gases consist of carbon dioxide (CO<sub>2</sub>), methane (CO<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and fluorinated gases. Source: United States Environmental Protection Agency, *Greenhouse Gas Emissions: Overview of Greenhouse Gases* (Web Page) <<https://www.epa.gov/ghgemissions/overview-greenhouse-gases>>.

<sup>3</sup> Fossil fuels mean coal, petroleum (oil), and natural gas. Source: Kinder Morgan, 'The Need For Fossil Fuel' (Web Page) 2 <[https://www.kindermorgan.com/content/docs/White\\_Fossil\\_Fuels.pdf](https://www.kindermorgan.com/content/docs/White_Fossil_Fuels.pdf)>.

<sup>4</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2018* (Report, 2019) 4 <<https://www.environment.gov.au/system/files/resources/408fcc37-dcfd-4ab8-a4f9-facc6bd98ea6/files/nggi-quarterly-update-dec-2018.pdf>>.

<sup>5</sup> See Table 1 in section 2.3.

petroleum activities. Although the respective sizes of Norway and Australia are substantially different, Australia shares with Norway a similar commitment to modern environmental regulation. Both countries' economies are highly dependent on resource extraction and export. Yet Norway has done more to limit its resource industry GHGe.

There are also some important differences between the two countries. Both countries are constitutional monarchies, and both are governed under systems of parliamentary democracy, which consist of ministers leading different executive departments being directly responsible to the Parliament. However, Norway has a unitary system of government while Australia has a federal system. Although Norway and Australia have substantially different legal systems, Norway has a civil code system while Australia has adopted the English common law legal system, the difference in legal systems is a relatively small concern. A significant difference in the petroleum industry is that the Norwegian government is a participant in petroleum exploration and production, as well as the regulator. In Australia, the government acts only as a regulator and does not otherwise participate in the industry. The petroleum industry in Norway is operated as a state entity with principles for administering petroleum resources for public benefit, in contrast to Australia, which suffers from regulatory capture and close alignment between the Liberal and National parties and fossil fuel companies.<sup>6</sup>

Ultimately, it is useful to consider how Norway is striking a balance by being both a leader in the fossil fuel industry and at the forefront of climate policies with the level of its GHGe slightly falling. Despite having higher levels of oil and gas production, Norway's GHGe are significantly lower than Australia's.<sup>7</sup> Australia has not been,<sup>8</sup> and is not presently, at the forefront of international climate policy. It is also a leader in the fossil fuel export industry (both coal and natural gas) and still faces the challenge of reducing GHGe from domestic consumption of fossil fuels. Notably, its GHGe are rising because of its increased fossil fuel exports, especially Liquefied Natural Gas (LNG).

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<sup>6</sup> J. Brett, *Quarterly Essay 78 - The Coal Curse: Resources, Climate and Australia's Future* (Schwartz Publishing Pty Limited, 2020) 15.

<sup>7</sup> See comparison table in section 2.3.

<sup>8</sup> Robyn Eckersley, 'Poles Apart?: The Social Construction of Responsibility for Climate Change in Australia and Norway' (2013) 59(3) *Australian Journal of Politics and History* 382, 386.

## 1.0 Aim and Significance of Research

### 1.1 Aim of Research

This research will show what Australia can learn from Norwegian legislation and policies to ensure that the regulation of GHGe in the fossil fuel industry (extraction, processing, and consumption of coal, oil and gas for export or domestic use) meets the requirements of the *PA*. It will do so by using comparative law methodology highlighting the four mechanisms or instruments used to reduce GHGe; namely, a carbon tax, an emissions trading scheme (ETS), renewable energy (RE), and carbon capture and storage (CCS) to answer the following three research questions in respect of each country:

- (i) Why are the two countries *PA* commitments quite different?
- (ii) Why does each country have different records on using each of these four instruments?
- (iii) What are the different policies and laws in each country for limiting or reducing GHGe?

This thesis is focused on the legal differences rather than historical and political differences. The discussion of scope 3 emissions regulation and liability, and environmental impact assessment are excluded as it is beyond the scope of this thesis.

### 1.2 Significance of Research

This project is significant for two primary reasons. Firstly, it addresses how the *PA* targets can be achieved. The level of GHGe in Australia has risen annually from 2014 noting a small dip in mid 2016 and mid 2018.<sup>9</sup> With the current trajectory of rising levels, it will be almost impossible to reach the *PA* targets.<sup>10</sup>

Secondly, it addresses strategies for contribution by the petroleum industry to reducing GHGe in order to achieve the *PA* targets. This thesis will examine instruments such as carbon tax, ETS, RE, and CCS.

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<sup>9</sup> Department of Industry, Innovation and Science, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: September 2019* (Report, 2020) 5 <<https://www.industry.gov.au/sites/default/files/2020-02/nggi-quarterly-update-sep-2019.pdf>>; Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2017* (Report, 18 May 2018) 5 <<https://publications.industry.gov.au/publications/climate-change/system/files/resources/gas-group-2/nggi-quarterly-update-dec-2017-revised.pdf>>.

<sup>10</sup> Michael Slezak, 'Australia's Emissions Rise Again In 2017, Putting Paris Targets In Doubt', *The Guardian*, (online, 29 March 2018) <<https://www.theguardian.com/environment/2018/mar/29/australias-emissions-rise-again-in-2017-putting-paris-targets-in-doubt>>.



## 2.0 Brief History of Greenhouse Gas Emissions in Australia and Norway

### 2.1 Australia's Greenhouse Gas Emissions

GHGe in Australia have been continuously rising, with total emissions hitting the highest level on record in 2019.<sup>11</sup> Two notable private analyses suggest that the current trend in Australia's GHGe shows that it will not meet its *PA* commitment to reduce GHGe by 26-28% below 2005 levels by 2030.<sup>12</sup> According to the Australia Institute in March 2018, the projection of Australia's total emissions is 570 Mt CO<sub>2</sub>-e by 2030, while 26% reduction from 2005 emissions following the National Determined Contribution (NDC) would amount to 442 Mt CO<sub>2</sub>-e by 2030.<sup>13</sup> In December 2018, Ndevr Environmental stated that Australia is not on track to meet its *PA* targets.<sup>14</sup>

One of the key obstacles to Australia meeting its *PA* commitment is the heavy economic reliance on fossil fuels. Australia is a country rich in fossil fuel resources and the fossil fuel industry is important to its economy, both for domestic energy consumption and export of fossil fuel resources. Almost 63.3% of GHGe in Australia are from the fossil fuel

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<sup>11</sup> Lisa Cox, 'Australia's Emissions Reach The Highest On Record, Driven By Electricity Sector', *The Guardian* (online, 9 July 2019) <<https://www.theguardian.com/australia-news/2019/jul/09/australias-emissions-reach-the-highest-on-record-driven-by-electricity-sector>>. The analysis excludes 'unreliable data' from the land use sector.

<sup>12</sup> Australia Nationally Determined Contribution is to reduce GHGe by '26 to 28 per cent below 2005 levels by 2030'. Source: Australian Government Department of Industry, Science, Energy and Resources, *Australia's 2030 Climate Change Target* (Web Page) <<https://www.environment.gov.au/climate-change/publications/factsheet-australias-2030-climate-change-target>>.

<sup>13</sup> Hugh Saddler, 'National Energy Emissions Audit March 2018', (Web Page, March 2018) 7 <<http://www.tai.org.au/sites/default/files/National%20Energy%20Emissions%20Audit%20March%202018.pdf>>.

<sup>14</sup> Ndevr Environmental, *Tracking 2 Degrees – FY18 Q4* (Web Page, 2019) <<https://ndevr.com.au/tracking-2-degrees-fy2018-q4/>>; Lisa Cox, 'Australia's Carbon Emissions Highest On Record, Data Shows', *The Guardian* (online, 13 December 2018) <<https://www.theguardian.com/australia-news/2018/dec/13/australias-carbon-emissions-highest-on-record-data-shows>>.

industry, (33.8% electricity sector, 18.9% from stationary energy excluding electricity,<sup>15</sup> and 10.6% from fugitive emissions<sup>16</sup>).<sup>17</sup>

Despite warnings from the Intergovernmental Panel on Climate Change (IPCC), the Australian Government is still supporting the use of coal.<sup>18</sup> To meet domestic energy demands, around 80% of Australian electricity is generated by coal and gas fired power stations.<sup>19</sup> Australia is the largest exporter of metallurgical coal and second largest thermal coal exporter in the world.<sup>20</sup> Besides domestic use, these types of coal are exported mainly to Asian countries (primarily Japan, China, South Korea, and Taiwan).<sup>21</sup>

Australia's heavy involvement in the oil and gas industry is also causing its GHGe to rise.<sup>22</sup> In the last three years, GHGe have been rising from the production of LNG. Australia currently is the largest LNG exporter in the world overtaking Qatar,<sup>23</sup> mainly exporting to

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<sup>15</sup> Stationary energy excluding electricity means 'emissions from direct combustion of fuels, predominantly from the manufacturing, mining, residential and commercial sectors. The mining sector includes petroleum, coal, crude oil, and gas.' Source: Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2018* (Report, 2019) 12 <<https://www.environment.gov.au/system/files/resources/408fcc37-dcfd-4ab8-a4f9-facc6bd98ea6/files/nggi-quarterly-update-dec-2018.pdf>>.

<sup>16</sup> Fugitive emissions are emissions that 'occur during the production, processing, transport, storage, transmission and distribution of fossil fuels. These include coal, crude oil and natural gas production and processing. Emissions from decommissioned underground coal mines are also included in this sector.' Source: Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2018* (Report, 2019) 16.

<sup>17</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: June 2019* (Report, 2019) 8 <<https://www.environment.gov.au/system/files/resources/8d47dec2-cd70-4a67-a7ab-85d67f3d53be/files/nggi-quarterly-update-jun-2019.pdf>>.

<sup>18</sup> Paul Karp, 'Australian Government Backs Coal in Defiance of IPCC Climate Warning', *The Guardian* (online, 9 October 2018) <<https://www.theguardian.com/australia-news/2018/oct/09/australian-government-backs-coal-defiance-ipcc-climate-warning>>.

<sup>19</sup> Australian Government Department of Industry, Science, Energy and Resources, *Government Priorities: Energy Supply* (Web Page) <<https://www.energy.gov.au/government-priorities/energy-supply>>.

<sup>20</sup> Department of Industry, Innovation and Science, Parliament of Australia, *Resources and Energy Quarterly March 2019* (Report, March 2019) 39, 48 <<https://publications.industry.gov.au/publications/resourcesandenergyquarterlymarch2019/documents/Resources-and-Energy-Quarterly-March-2019.pdf>>

<sup>21</sup> Department of Industry, Innovation and Science, Parliament of Australia, *Resources and Energy Quarterly March 2019* (Report, March 2019) 39, 48.

<sup>22</sup> Michael Slezak, 'Australia's Emissions Rise Again In 2017, Putting Paris Targets In Doubt', *The Guardian*, (online, 29 March 2018) <<https://www.theguardian.com/environment/2018/mar/29/australias-emissions-rise-again-in-2017-putting-paris-targets-in-doubt>>.

<sup>23</sup> Nick Toscano, 'Australia Tops Qatar As World's Biggest LNG Exporter', *The Sydney Morning Herald* (online, 6 January 2020) <<https://www.smh.com.au/business/the-economy/australia-tops-qatar-as-world-s-biggest-lng-exporter-20200106-p53p5h.html>>.

Japan, China and South Korea.<sup>24</sup> The growth in LNG has increased domestic stationary energy emissions and fugitive emissions.<sup>25</sup> However, the Australian Government claims that the LNG industry is assumed to be displacing coal and reducing global emissions.<sup>26</sup>

Australia's active involvement in the fossil fuel industry poses a challenge to reduce GHGe. It is said to be 'underperforming in greenhouse gas (GHG) reduction and energy systems decarbonisation among the developed nations'.<sup>27</sup> This is mainly due to two factors: (1) the current reduction target is seen by many as inadequate; and (2) Australia's emissions are rising rather than falling. Currently, there is no adequate legislation or policy for reducing GHGe in Australia.<sup>28</sup>

## 2.2 Norway's Greenhouse Gas Emissions

GHGe in Norway have been stable from 2009-2014 and have been reducing from 2015-2018.<sup>29</sup> As of 1 November 2019, Norway's GHGe dropped by 0.9% between 2017-2018.<sup>30</sup> Norway is rich with oil and gas resources and the petroleum industry is very important for the Norwegian economy. It is one of the leading exporters of oil and gas in the world. In Norway, a high percentage of GHGe comes from CO<sub>2</sub> emissions, and much of it (about 30%) is from the oil and gas industry.<sup>31</sup> Despite being a leading oil and gas exporter, Norway has implemented effective legislation and policies to ensure that the level of GHGe are not rising. Its per capita emissions are also much lower than Australia's.

Norway is also at the forefront of climate policies, which include a carbon tax and an emissions trading scheme. The country has a low carbon economy and is rich with hydropower

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<sup>24</sup> Department of Industry, Innovation and Science, Parliament of Australia, *Resources and Energy Quarterly March 2019* (Report, March 2019) 60.

<sup>25</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2018* (Report, 2019) 8.

<sup>26</sup> Department of the Environment and Energy, Parliament of Australia, *Australia's National Greenhouse Gas Inventory March 2019 Quarterly Update Released* (Web Page, 30 August 2019) <<https://www.minister.industry.gov.au/ministers/taylor/media-releases/australias-national-greenhouse-gas-inventory-march-2019-quarterly>>.

<sup>27</sup> Grace Cheung and Peter J. Davies, 'In the Transformation of Energy Systems: What is Holding Australia Back?' (2017) 109 *Energy Policy* 96, 96.

<sup>28</sup> This is explained further in Chapter 2.

<sup>29</sup> Norwegian Petroleum, *Emissions to Air* (Web Page) <<https://www.norskipetroleum.no/en/environment-and-technology/emissions-to-air/>>.

<sup>30</sup> Statistics Norway, *Emissions to Air* (Web Page, 14 January 2020) <<https://www.ssb.no/en/klimagassn>>.

<sup>31</sup> International Emissions Trading Association, 'Norway: An Emissions Trading Case Study', (Web Page, May 2015) 3 <[http://www.ietat.org/resources/Resources/Case\\_Studies\\_Worlds\\_Carbon\\_Markets/2015/norway\\_case\\_study\\_may2015.pdf](http://www.ietat.org/resources/Resources/Case_Studies_Worlds_Carbon_Markets/2015/norway_case_study_may2015.pdf)>.

resources enabling it to maintain low carbon emissions. About 95.0% of Norway's electricity is generated from hydropower.<sup>32</sup> The use of hydropower was not a recent policy choice or regulatory outcome, but more of an historical artefact which also influenced the development of the petroleum industry in Norway as mainly for export, not for energy use. Norway's GHGe is lower in the past two decades compared to other Scandinavian countries.<sup>33</sup> The question arises as to how Norway is reducing its GHGe while being actively involved in the fossil fuel industry with high levels of oil and gas production. This will be analysed in Chapter 3.

### 2.3 Comparison of Key Features Between Australia and Norway

The table below provides the key features of a brief comparison between Australia and Norway relating to the fossil fuel industry and GHGe. It demonstrates that Australia has much higher GHGe per capita and that total GHGe are rising with the recent increase in LNG production.

**Table 1: Key features between Australia and Norway**

	<b>Australia</b>	<b>Norway</b>
Size of country	7,692,024 sq km <sup>2</sup> <sup>34</sup>	385,155 sq km <sup>2</sup> <sup>35</sup>
Population	25.4 million <sup>36</sup>	5.4 million <sup>37</sup>
Crude oil production	310 bbl/day (as of 2016) <sup>38</sup>	1650-1800 bbl/day (as of 2016) <sup>40</sup>

<sup>32</sup> Statistics Norway, *Electricity* (Web Page, 2 December 2019) <<https://www.ssb.no/en/energi-og-industri/statistikker/elektrisitet/aar>>.

<sup>33</sup> Organisation for Economic and Co-operation and Development, *Greenhouse Gas Emissions* (Web Page) <[https://stats.oecd.org/Index.aspx?DataSetCode=AIR\\_GHG#](https://stats.oecd.org/Index.aspx?DataSetCode=AIR_GHG#)>.

<sup>34</sup> Australian Government Geoscience Australia, *Australia's Size Compared* (Web Page) <<https://www.ga.gov.au/scientific-topics/national-location-information/dimensions/australias-size-compared>>.

<sup>35</sup> Norway, *About Norway* (Web Page, 2020) <<https://www.visitnorway.com/media/about-norway/>>.

<sup>36</sup> Worldometers, *Australia Population* (Web Page, 15 March 2020) <<https://www.worldometers.info/world-population/australia-population/>>.

<sup>37</sup> Worldometers, *Norway Population* (Web Page, 15 March 2020) <<https://www.worldometers.info/world-population/norway-population/>>.

<sup>38</sup> Trading Economics, *Australia Crude Oil Production* (Web Page) <<https://tradingeconomics.com/australia/crude-oil-production>>.

<sup>40</sup> Trading Economics, *Norway Crude Oil Production* (Web Page) <<https://tradingeconomics.com/norway/crude-oil-production>>.

	<b>Australia</b>	<b>Norway</b>
	7,874 ML in 2019 <sup>39</sup>	81,800 ML in 2019 <sup>41</sup>
Coal production	552,320 thousand short tons (as of 2017) <sup>42</sup>	144 thousand short tons (as of 2017) <sup>43</sup>
Gross natural gas production <sup>44</sup>	2,384.33 billion cubic feet (as of 2015) <sup>45</sup> 154,484 Mm <sup>3</sup> in 2019 <sup>46</sup>	5,763.41 billion cubic feet (as of 2015) <sup>47</sup> 115,200 Mm <sup>3</sup> in 2019 <sup>48</sup>
Crude oil exports	214.355 barrel/day (as of 2018) <sup>49</sup>	1,254.920 barrel/day (as of 2018) <sup>50</sup>

<sup>39</sup> Department of Industry, Science, Energy and Resources, Parliament of Australia, *Australian Petroleum Statistics* (Report Issue 281, December 2019) 7-8 <<https://www.energy.gov.au/sites/default/files/Australian%20Petroleum%20Statistics%20-%20Issue%20281%20December%202019.pdf>>. This figure is an accumulation of crude oil production from January-December 2019. ML denotes million litres. These are rough figures noting the different conversion units used and different conditions crude oil were produced. Assistance was obtained from an expert in this area to convert the figures.

<sup>41</sup> Norwegian Petroleum Directorate, *Production Figures December 2019* (Web Page, 17 January 2020) <<https://www.npd.no/en/facts/news/Production-figures/2020/production-figures-december-2019/>>. Norway's total oil production for 2019 amounted to 81.8 MSm<sup>3</sup> which equals to 81,800 ML. These are rough figures noting the different conversion units used and different conditions crude oil were produced.

<sup>42</sup> Knoema, *Australia – Total Primary Coal Production* (Web Page) <<https://knoema.com/atlas/Australia/topics/Energy/Coal/Primary-coal-production>>.

<sup>43</sup> Knoema, *Norway – Total Primary Coal Production* (Web Page) <<https://knoema.com/atlas/Norway/topics/Energy/Coal/Primary-coal-production>>.

<sup>44</sup> Gross natural gas production has increased in Australia lately in 2018. See Figure 12 in Department of the Environment and Energy, *Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2018* (Commonwealth of Australia, 2019) 13.

<sup>45</sup> Knoema, *Australia – Gross Natural Gas Production* (Web Page) <<https://knoema.com/atlas/Australia/topics/Energy/Gas/Natural-gas-production>>.

<sup>46</sup> Department of Industry, Science, Energy and Resources, Parliament of Australia, *Australian Petroleum Statistics* (Report Issue 281, December 2019) 7-8 <<https://www.energy.gov.au/sites/default/files/Australian%20Petroleum%20Statistics%20-%20Issue%20281%20December%202019.pdf>>. This figure is an accumulation of natural gas production from January-December 2019. These are rough figures noting the different conversion units used and different conditions gas were produced.

<sup>47</sup> Knoema, *Norway – Gross Natural Gas Production* (Web Page) <<https://knoema.com/atlas/Norway/topics/Energy/Gas/Natural-gas-production>>.

<sup>48</sup> Norwegian Petroleum Directorate, *Production Figures December 2019* (Web Page, 17 January 2020) <<https://www.npd.no/en/facts/news/Production-figures/2020/production-figures-december-2019/>>. These are rough figures noting the different conversion units used and different conditions gas were produced.

<sup>49</sup> CEIC, *Australia Crude Oil: Exports* (Web Page) <<https://www.ceicdata.com/en/indicator/australia/crude-oil-exports>>.

<sup>50</sup> CEIC, *Norway Crude Oil: Exports* (Web Page) <<https://www.ceicdata.com/en/indicator/norway/crude-oil-exports>>.

	Australia	Norway
Greenhouse gas emissions	532,971.15 MtCO <sub>2</sub> -e (as of 2016) <sup>51</sup> 538.2 MtCO <sub>2</sub> -e (as of 2018) <sup>52</sup>	53,242.51 MtCO <sub>2</sub> -e (as of 2016) <sup>53</sup> 52 MtCO <sub>2</sub> -e (as of 2018) <sup>54</sup>
CO <sub>2</sub> emissions per capita	21.5 tCO <sub>2</sub> /capita (as of 2016) <sup>55</sup>	8.28 tCO <sub>2</sub> /capita (as of 2016) <sup>56</sup>
Environmental Performance Index Score and Rank <sup>57</sup>	74.12, rank 21 <sup>58</sup>	77.49, rank 14 <sup>59</sup>
CO <sub>2</sub> emissions intensity	0.2951 tonnes kg CO <sub>2</sub> -e per \$1000 of real GDP (as of 2018) <sup>60</sup>	0.13 tonnes CO <sub>2</sub> -e per \$1000 of dollar GDP (as of 2016) <sup>62</sup>

<sup>51</sup> Department of Environment and Energy, *National Greenhouse Gas Inventory – Kyoto Protocol Classifications* (Web Page) <<http://ageis.climatechange.gov.au>>.

<sup>52</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2018* (Report, 2019) 3.

<sup>53</sup> Organisation for Economic Co-operation and Development, *Greenhouse Gas Emissions* (Web Page) <[https://stats.oecd.org/Index.aspx?DataSetCode=AIR\\_GHG#](https://stats.oecd.org/Index.aspx?DataSetCode=AIR_GHG#)>.

<sup>54</sup> Statistics Norway, *Emissions to Air* (Web Page, 14 January 2020) <<https://www.ssb.no/en/natur-og-miljo/statistikker/klimagassn>>. GHGe data for 2019 is not available yet.

<sup>55</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: June 2018* (Report, 2018) 3, 18

<<https://www.environment.gov.au/system/files/resources/e2b0a880-74b9-436b-9ddd-941a74d81fad/files/nggi-quarterly-update-june-2018.pdf>>. However, Knoema notes that Australia's CO<sub>2</sub> emissions per capita is 17.22 as of 2016. Source: Knoema, *CO<sub>2</sub> Emissions Per Capita* (Web Page) <<https://knoema.com/atlas/ranks/CO2-emissions-per-capita>>.

<sup>56</sup> Knoema, *CO<sub>2</sub> Emissions Per Capita* (Web Page) <<https://knoema.com/atlas/ranks/CO2-emissions-per-capita>>.

<sup>57</sup> The Environmental Performance Index (EPI) involves 180 countries covering ten issue categories: air quality, water and sanitation, heavy metals, agriculture, water resources, air pollution, climate and energy, fisheries, forests, and biodiversity and habitat. These issues provide an indication at a national scale of how close countries are to establish their environmental policy goals. The ten issue categories mentioned are then 'combined into two policy objectives – Environmental Health and Ecosystem Vitality – and then finally consolidated into the overall EPI.'

Source: Environmental Performance Index, *Chapter 1 Introduction: The Logic Of Environmental Metrics* (Web Page) <<https://epi.envirocenter.yale.edu/epi-report-2018/chapter-1-introduction>>.

<sup>58</sup> Environmental Performance Index, *Australia* (Web Page) <<https://epi.envirocenter.yale.edu/epi-country-report/AUS>>.

<sup>59</sup> Environmental Performance Index, *Norway* (Web Page) <<https://epi.envirocenter.yale.edu/epi-country-report/NOR>>.

<sup>60</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: June 2018* (Report, 2018) 3. In the actual report, CO<sub>2</sub> emissions intensity as of 2018 was 0.29kg CO<sub>2</sub>-e per \$ of real GDP and 2016 was 0.33kg CO<sub>2</sub>-e per \$ of real GDP. For easy reference, I have converted the units to tonnes CO<sub>2</sub>-e per \$1000 of GDP.

<sup>62</sup> Knoema, *Norway CO<sub>2</sub> Emissions Intensity* (Web Page) <<https://knoema.com/atlas/Norway/CO2-emissions-intensity>>.

	Australia	Norway
	0.33525 tonnes kg CO <sub>2</sub> -e per \$1000 of real GDP (as of 2016) <sup>61</sup>	

### 3.0 Different National Objectives in Australia and Norway

Each country has different national objectives and perspectives regarding GHGe and the fossil fuel industry. The different national objectives of each country explain the workings of the petroleum industry. The Norwegian Government's active State participation in and control of the petroleum industry helps Norway to maintain a stable/slowly reducing level of GHGe.<sup>63</sup> The Australian Government participates minimally in petroleum activities, leaving exploration and production to the oil and gas companies. The Australian Government's motive is to attract more investment into Australia. The lack of control by the Australian Government of the fossil fuel industry creates uncertainty for the reduction of GHGe. Some difference in approach may be attributable to the constitutional fact that Norway is a unitary State and Australia is a federation giving the State (regional) governments primary management of natural resources.

#### 3.1 Australia

Petroleum development in Australia was parallel to the development in the North Sea,<sup>64</sup> following the Halibut and Kingfisher oil fields discoveries in the mid-1960s in the Bass Strait,<sup>65</sup> which was the most dominant petroleum producing field until the development of the North West Shelf.<sup>66</sup> In the 1980s, gas fields (i.e. Gorgon and Pluto) were discovered on the North West Shelf.<sup>67</sup> However, due to lack of interest in gas and cost of developing the fields, Australia focused on its petroleum industry, particularly the Gippsland and Otway Basins.<sup>68</sup> In

<sup>61</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: June 2018* (Report, 2018) 3. In the actual report, CO<sub>2</sub> emissions intensity as of 2018 was 0.29kg CO<sub>2</sub>-e per \$ of real GDP and 2016 was 0.33kg CO<sub>2</sub>-e per \$ of real GDP. For easy reference, I have converted the units to tonnes CO<sub>2</sub>-e per \$1000 of GDP.

<sup>63</sup> The state's involvement in its petroleum industry will be further discussed in Chapter 3.

<sup>64</sup> J. Chandler and T. Hunter, *Petroleum Law in Australia* (Chatswood, N.S.W, LexisNexis Butterworths, 1<sup>st</sup> ed, 2013) 38.

<sup>65</sup> J. Chandler and T. Hunter, *Petroleum Law in Australia* (Chatswood, N.S.W, LexisNexis Butterworths, 1<sup>st</sup> ed, 2013) 38.

<sup>66</sup> J. Chandler and T. Hunter, *Petroleum Law in Australia* (Chatswood, N.S.W, LexisNexis Butterworths, 1<sup>st</sup> ed, 2013) 38.

<sup>67</sup> J. Chandler and T. Hunter, *Petroleum Law in Australia* (Chatswood, N.S.W, LexisNexis Butterworths, 1<sup>st</sup> ed, 2013) 39.

<sup>68</sup> J. Chandler and T. Hunter, *Petroleum Law in Australia* (Chatswood, N.S.W, LexisNexis Butterworths, 1<sup>st</sup> ed, 2013) 39.

the past decade, the focus has shifted to gas, and Browse, Carnarvon and Bonaparte Basins are the centre of attraction.<sup>69</sup> Over recent years, Australia has grown to be a large producer of gas.

In Australia, onshore petroleum resources are owned by the State.<sup>70</sup> State Governments established State-owned companies to participate in the oil and gas industry; e.g. WA Petroleum and Santos (South Australia Northern Territory Oil Search). In the early years of petroleum discovery, the objective of the Australian Government was to attract investment to enable the development of petroleum resources available in the country using the concession model.<sup>71</sup>

Offshore petroleum regulation in Australia is complex because of the Commonwealth, State and territorial jurisdiction over maritime territory. With the international territorial baseline drawn around offshore islands, large maritime areas were designated 'internal waters' and 'coastal waters' under State and territory jurisdiction.<sup>72</sup> Commonwealth jurisdiction over petroleum resources extended from the outer boundary of the coastal waters.<sup>73</sup> Each jurisdiction initially passed offshore petroleum legislation identical to the *Commonwealth Petroleum (Submerged Lands) Act 1967* (Cth) (*PSLA 1967*). Complexity and inefficiency resulted from different divisions (Commonwealth, the Northern Territory (NT), and States) administered by separate agencies. In 2006, the Commonwealth enacted a similar version of the *PSLA 1967*, the *Offshore Petroleum Act 2006* (Cth). This Act was renamed the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) (*OPGGSA 2006*) after incorporating greenhouse gas storage provisions and is the current offshore petroleum legislation in Australia.<sup>74</sup> The *OPGGSA 2006* provides a detailed framework for the award and management of licenses, occupational health and safety provisions, and environmental provisions.

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<sup>69</sup> J. Chandler and T. Hunter, *Petroleum Law in Australia* (Chatswood, N.S.W, LexisNexis Butterworths, 1<sup>st</sup> ed, 2013) 39.

<sup>70</sup> Tina Hunter, 'Comparative Law as an Instrument in Transnational Law: The Example of Petroleum Regulation' (2009) 21(3) *Bond Law Review* 42, 48.

<sup>71</sup> Tina Hunter, 'The Role of Regulatory Frameworks and State Regulation in Optimising the Extraction of Petroleum Resources: A Study of Australia and Norway' (2014) 1(1) *The Extractive Industries and Society* 48, 50.

<sup>72</sup> J. Chandler, 'Australia's Offshore Petroleum Resource Management System: How Does It Compare with Norway and the UK?' (2018) 36(3) *Australian Resources and Energy Law Journal* 46, 50.

<sup>73</sup> J. Chandler, 'Australia's Offshore Petroleum Resource Management System: How Does It Compare with Norway and the UK?' (2018) 36(3) *Australian Resources and Energy Law Journal* 46, 50.

<sup>74</sup> The amending Act was the *Offshore Petroleum Amendment (Greenhouse Gas Storage) Act 2008* (Cth).



The OPGGSA 2006 was implemented with three other regulations: the *Offshore Petroleum and Greenhouse Gas Storage (Resource Management and Administration) Regulations 2011* (Cth), the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009* (Cth) and the *Offshore Petroleum and Greenhouse Gas Storage (Safety) Regulations 2009* (Cth). This Act is somewhat different to others as it places regulatory details in the primary legislation, rather than in the regulations.<sup>75</sup>

In Australia, Commonwealth Government participation in the oil and gas industry and petroleum activities is minimal; instead, it authorises oil companies to explore and develop the oil and gas industry. The Government's relationship with oil companies is only to attract foreign investment and increase oil companies' confidence to invest in Australia.<sup>76</sup> The Australian Government is said to be taking a 'referee only' position in terms of its participation in the petroleum activities.<sup>77</sup>

### 3.2 Norway

The Norwegian petroleum 'era' began in 1969 with the Ekofisk discovery. At that time, the Norwegian State lacked experience in developing a regulatory framework for petroleum resources, and so it adopted the United Kingdom's approach. Later, it was dissatisfied with this approach due to the minimal role played by the State and, in the early 1970s, it changed petroleum policy and adopted a 'social democratic approach'.<sup>78</sup> In 1972, Norway's national oil company or State-owned oil company, Statoil (currently known as Equinor), was created.<sup>79</sup> This led to an agreement in the Storting (Parliament) that the Norwegian Petroleum Directorate (NPD) would regulate the petroleum industry.<sup>80</sup>

The NPD was established in 1972 to manage Norwegian development of petroleum resources, and reports directly to the Ministry of Petroleum and Energy (MPE). The NPD is a

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<sup>75</sup> Terence Daintith, 'A Critical Evaluation of the Petroleum (Submerged Lands) Act as a Regulatory Regime' (2000) *AMPLA Yearbook* 91, 93.

<sup>76</sup> Tina Hunter, 'The Role of Regulatory Frameworks and State Regulation in Optimising the Extraction of Petroleum Resources: A Study of Australia and Norway' (2014) 1(1) *The Extractive Industries and Society* 48, 57.

<sup>77</sup> Tina Hunter, Submission to the Australian Productivity Commission, *Review of the Australian Upstream Petroleum Sector Submission to the Australian Productivity Commission* 15 <<https://www.pc.gov.au/inquiries/completed/upstream-petroleum/submissions/sub009.pdf>>.

<sup>78</sup> Tina Hunter, 'It's time: Petroleum policy change for sustainable development in the Australian offshore upstream petroleum sector' (2009) *Journal of Applied Law and Policy* 31, 42.

<sup>79</sup> Equinor, *About Us* (Web Page) <<https://www.equinor.com/en/about-us.html>>.

<sup>80</sup> Norsk olje & gass, *Norway's petroleum history* (Web Page) <<https://www.norskoljeoggass.no/en/about-us/oljehistorien/>>.

single authority in charge of the Norwegian oil and gas resources, which makes the Norwegian system a more efficient one.

The Norwegian Parliament then adopted the '10 oil commandments', being principles underpinning the oil policy. These principles were created to ensure that the oil activities carried out benefited the entire nation,<sup>81</sup> and were enshrined in the Norwegian legislative framework to be legally enforceable. The *Petroleum Activities Act 1996 (PAA 1996)* contains, according to Tina Hunter, two important elements of Norwegian petroleum policy:

- 1) oil and gas in Norway is part of national wealth and should be for the benefit of the population as a whole; and
- 2) national policy should attract the best international expertise, possessing a high level of competence.<sup>82</sup>

These policy principles were also reflected in the main regulatory framework in *PAA 1996* s 1-2. There are three principles that can be drawn from the *PAA 1996*; namely, the 'State Control' principle stated in *PAA 1996* s 1-1, the 'Society Benefit' principle stated in *PAA 1996* s 1-2 and the 'Prudent Production' principle stated in *PAA 1996* s 4-1.<sup>83</sup> The 'Prudent Production' principle is to be read in line with *PAA 1996* s 10-2 which states that 'the licensee shall ensure that the activity can be carried out prudently, in accordance with applicable legislation, and in a manner that safeguards good resource management, health, safety and the environment'.

The *PAA 1996* and the *Petroleum Activities Regulations (PR) 1997* comprise the regulatory framework for petroleum activities in Norway. This legislation clearly shows that all exploration and production of petroleum in Norway is regulated by the State. Petroleum activities cannot commence without a valid licence, approval and consent as stated in *PAA 1996* s 1-3. The two main principles that appear from Norway's licensing framework are predictability and transparency.<sup>84</sup>

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<sup>81</sup> 'Starting White Paper 28 (2010-2011) – Unofficial translation of Chapter 1' (Web Page) <[https://www.regjeringen.no/globalassets/upload/oed/petroleumsmeldingen\\_2011/oversettelse/chapter1\\_white\\_paper\\_28-2010-2011.pdf](https://www.regjeringen.no/globalassets/upload/oed/petroleumsmeldingen_2011/oversettelse/chapter1_white_paper_28-2010-2011.pdf)>.

<sup>82</sup> Tina Hunter, 'Comparative Law as an Instrument in Transnational Law: The Example of Petroleum Regulation' (2009) 21(3) *Bond Law Review* 42, 54.

<sup>83</sup> John Chandler, 'Australia's Offshore Petroleum Resource Management System: How Does It Compare with Norway and the UK?' (2018) 36(3) *Australian Resources and Energy Law Journal* 46, 52.

<sup>84</sup> Norwegian Ministry of Foreign Affairs, Parliament of Norway, *Transparency in the Norwegian Petroleum Sector* (Report, 2006) 5 <<https://www.regjeringen.no/globalassets/upload/kilde/ud/bro/2006/0038/ddd/pdfv/293033-tmps.pdf>>.

Norway controls its petroleum production by awarding a production licence that requires the licence holders to enter a Joint Operating Agreement (JOA) with the Norwegian State. A JOA is entered between the Norwegian State and the holders of the licence. Petroleum exploitation cannot commence without this agreement.<sup>85</sup> Through the JOA, the State participates in the exploration and production of petroleum, and gains a greater level of knowledge of the industry. The use of the JOA allows the State to have greater control over its oil and gas resources by facilitating greater transparency between the State and licence holders.<sup>86</sup>

The Norwegian system is known for its balance of public transparency and commercial confidentiality, which encourages proactive participation between oil companies and the State within the regulatory framework. Although Norway has very high taxes, and a high level of State control over the exploration and production of petroleum, it remains an attractive investment place for oil and gas companies.

### *3.3 Comparison of Different Approaches Taken by the Australian and Norwegian Governments to Reduce Greenhouse Gas Emissions*

The Government of Norway has, since the early 1990s, introduced policies to control GHGe.<sup>87</sup> They have prioritised their policies and measures for long-term cost-effectiveness. The Australian Government, on the other hand, accelerated development of climate change law only after the ratification of the *Kyoto Protocol to the United Nations Framework Convention on Climate Change 1997 (KP 1997)* in 2007.<sup>88</sup>

The main aim of the Norwegian Government was to move towards a low-carbon energy system, and to make a change to the economic structure that may cost more initially, but save money in the long run.<sup>89</sup> The Australian Government proposed to give its best efforts

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<sup>85</sup> *Petroleum Activities Act 1996* (Norway) s 3-3.

<sup>86</sup> Tina Hunter, 'Comparative Law as an Instrument in Transnational Law: The Example of Petroleum Regulation' (2009) 21(3) *Bond Law Review* 42, 66.

<sup>87</sup> Harald Dovland, 'Norwegian Climate Change Policies' (Seminar Paper, Ministry of Environment of Norway, 16 and 17 May 2005) 1  
<[https://unfccc.int/files/meetings/seminar/application/pdf/sem\\_pre\\_norway.pdf](https://unfccc.int/files/meetings/seminar/application/pdf/sem_pre_norway.pdf)>.

<sup>88</sup> Evgeny Guglyuvatty and Natalie P. Stoianoff, 'Carbon Policy in Australia – A Political History' (2016) *Green Fiscal Reform for a Sustainable Future* 31, 44; *Kyoto Protocol to the United Nations Framework Convention on Climate Change 1997*, opened for signature 11 December 1997, 2303 UNTS 162 (entered into force 16 February 2005).

<sup>89</sup> International Energy Agency, 'Energy Policies of EIA Countries: Norway 2017 Review' (Web Page) <<http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>> 11, archived at

to reduce GHGe and, at the same time, maintain a strong economy.<sup>90</sup> The Norwegian Government has been moderately reducing emissions, while the Australian Government has been increasing emissions.<sup>91</sup>

The Norwegian Government has shown its willingness to move towards a low-carbon energy system by adopting various policies aimed at reducing GHGe and making use of its RE. For example, the *PA* National Determined Contributions (NDCs) of the two countries show an interesting difference. Norway intends to reduce its GHGe by at least 40% below 1990 levels by 2030,<sup>92</sup> which is more than Australia's NDC of 26%-28% below 2005 levels by 2030<sup>93</sup>. RE is available in both countries. Norway has a legacy of a century in hydropower investment to build on, while Australia has more lately been investing in solar and wind energy, which are newer forms of RE.<sup>94</sup>

Further, there has been extensive funding for energy research, development and demonstration projects by the Norwegian Government. The Sleipner and Snohvit projects, which are large scale CCS projects, are evidence of this funding.<sup>95</sup> Australia has also been adopting CCS; however, progress is slower than Norway. The only large scale CCS project in Australia is the Gorgon project at Barrow Island on the North West coast of Western Australia.<sup>96</sup> This project finally came into operation in August 2019.<sup>97</sup>

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<<https://web.archive.org/web/20180919222931/http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>>.

<sup>90</sup> Australian Government, 'Australia's 2030 Climate Change Target' (Web Page) <<https://www.environment.gov.au/system/files/resources/c42c11a8-4df7-4d4f-bf92-4f14735c9baa/files/factsheet-australias-2030-climate-change-target.pdf>>; Department of the Environment and Energy, Parliament of Australia, *2017 Review of Climate Change Policies* (Report, December 2017) 5 <<https://www.environment.gov.au/system/files/resources/18690271-59ac-43c8-ae1-92d930141f54/files/2017-review-of-climate-change-policies.pdf>>.

<sup>91</sup> This is discussed in detail in Chapters 2 and 3.

<sup>92</sup> Government.no, *Norway submit it's National Plan on Climate* (Web Page, 20 December 2019) <[.](https://www.regjeringen.no/en/aktuelt/norge-legger-fram-statusrapport-pa-klima/id2683975/></a>; Climate Action Tracker, <i>Norway Pledges and Targets</i> (Web Page) <<a href=)

<sup>93</sup> Sophie Power, 'Paris Climate Agreement: A Quick Guide' (Research Paper Series 2017-2018, Science, Technology, Environment and Resources Section, 10 November 2017) 3 <[https://parlinfo.aph.gov.au/parlInfo/download/library/prspub/5623378/upload\\_binary/5623378.pdf](https://parlinfo.aph.gov.au/parlInfo/download/library/prspub/5623378/upload_binary/5623378.pdf)>.

<sup>94</sup> RE in Australia and Norway is discussed further in Chapter 5.

<sup>95</sup> International Energy Agency, 'Energy Policies of EIA Countries: Norway 2017 Review' (Web Page) <<http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>> 11, archived at <<https://web.archive.org/web/20180919222931/http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>>.

<sup>96</sup> CCS in Australia and Norway is discussed further in Chapter 6.

<sup>97</sup> Chevron, *Gorgon* (Web Page) <<https://www.chevron.com/projects/gorgon>>.

Norway's industrial sector, which includes the offshore petroleum industry and onshore industries, contributes '25% of the GDP and 8% of jobs'.<sup>98</sup> The emissions from this industry are dropping slowly, as seen in 2018.<sup>99</sup> Meanwhile, Australia's mining industry contributes to 11% of the GDP.<sup>100</sup> Fugitive emissions (coal, oil and gas) in 2018 amounted to 10.8% of Australia's total emissions, electricity 33.2%, stationary energy 19.1%; GHGe are on the rise over the years.<sup>101</sup> Emissions from these mining and petroleum industries produce more than half of Australia's GHGe.<sup>102</sup>

Comparison of carbon pricing outcomes is essential to understand GHGe in Australia and Norway. Norway has a carbon tax and an ETS, which is helping the country to modestly reduce its GHGe and attain a relatively stable level of emissions. Australia briefly had a carbon price between 2011-2014, but has otherwise failed to price carbon effectively. This is discussed in Chapters 2 and 3 respectively.

## 4.0 Research Methodology

The main methodology used in this thesis is comparative law methodology. The author Mark Van Hoecke has identified six methods that can be used for comparative legal research.<sup>103</sup> I have chosen four methods from Van Hoecke's suggested methods (the structural, functional, analytical, and historical) to be used for my legal research as they provide greater understanding in comparative legal research.

### 4.1 The Four Methods

#### 4.1.1 Structural Method

This is a traditional approach which looks at the families of legal systems or classifications of legal families. Examples would be common law versus civil law systems,

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<sup>98</sup> Enova, 'Towards a Low-Emissions Norwegian Industry' (Web Page, 2017) 4 <[https://www.enova.no/download?objectPath=/upload\\_images/C01AD0EB7BDF41E189A2608DB65752C2.pdf](https://www.enova.no/download?objectPath=/upload_images/C01AD0EB7BDF41E189A2608DB65752C2.pdf)>.

<sup>99</sup> Statistics Norway, *Emissions to Air* (Web Page, 14 January 2020) <<https://www.ssb.no/en/klimagassn>>. The figures for 2019 is not available yet.

<sup>100</sup> Department of Industry, Innovation and Science, Parliament of Australia, *Overview Resources and Energy Quarterly December 2017* (Report, December 2017) 3 <<https://publications.industry.gov.au/publications/resourcesandenergyquarterlydecember2017/documents/Resources-and-Energy-Quarterly-December-2017.pdf>>.

<sup>101</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2018* (Report, 2019) 16.

<sup>102</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2017* (Report, 18 May 2018) 8.

<sup>103</sup> Mark Van Hoecke, 'Methodology of Comparative Legal Research' (2015) LAW AND METHOD 1, 8.

Scandinavian, Nordic, and other systems. The structural method 'simplifies the presentation and facilitates an understanding' of the legal systems.<sup>104</sup> While this thesis acknowledges the structural differences between the Norwegian civil law system and the Australian common law system, this is a relatively small concern for the comparative analysis of this thesis. It is more significant that Norway is linked to the EU ETS.<sup>105</sup>

#### *4.1.2 Functional Method*

The authors Zweigert and Kotz, also known as the 'fathers of functionalism', believe that the functional method is the only method that falls under comparative law.<sup>106</sup> However, in recent times, Van Hoecke has identified six methods that can be used in comparative legal research, as seen above.

The functional method looks at a common problem in different jurisdictions with similar or different laws, and with similar or different results, focusing on the 'societal problem and the actual result of the legal approach to that problem'.<sup>107</sup> As noted by Palmer 'the common problem elicits all the rules and principles that produce the solution, and therefore one country's positive solution is the functional equivalent of another's solution, even if the doctrines and tools in two answers of this kind are not mutually coherent'.<sup>108</sup>

The thesis will discuss the following functional issues:

- 1) the national objectives and national fossil fuel industry approaches in addressing GHGe;
- 2) the adoption of regulatory measures (carbon tax, ETS, RE and CCS) to limit and reduce GHGe from the fossil fuel industry; and
- 3) the effectiveness of legislation and policies in limiting and reducing GHGe from the fossil fuel industries.

In addressing the functional issues, the thesis uses the 'concurrent analysis' style to structure the analysis by functional issue rather than by a comprehensive description of each jurisdiction.

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<sup>104</sup> Rene David and John E.C. Brierley, *Major Legal Systems In The World Today* (Stevens & Sons, 1985) 20.

<sup>105</sup> See EU ETS discussion in Chapter 3.

<sup>106</sup> Konrad Zweigert and Hein Kotz, *An Introduction to Comparative Law* (Clarendon Press, 3rd rev. ed, 1998) 63-313.

<sup>107</sup> Konrad Zweigert and Hein Kotz, *An Introduction to Comparative Law* (Clarendon Press, 3rd rev. ed, 1998) 28.

<sup>108</sup> Vernon Valentine Palmer, 'From Lerotholi to Lando: Some Examples of Comparative Law Methodology' (2004) 4(2) *Global Jurist Frontiers* 1, 18.

#### *4.1.3 Analytical Method*

The analytical method analyses laws and rules in different jurisdictions, and detects the similarities and differences in the legal systems.<sup>109</sup> This method is closely connected to and overlaps with other methods such as the functional method. The analytical method supplements the functional method by interpreting the legislation and policies so that the functional analysis may be completed. Therefore, this thesis will use the analytical method supplemented with the functional method to analyse the legislation and policies for managing GHGe in the fossil fuel industry in Australia and Norway.

#### *4.1.4 Historical Method*

In a comparative research project, the use of the historical method is important as it provides a level of understanding of the law and its workings. Its benefit will depend on the extent of knowledge of the law historically and its development throughout the years.<sup>110</sup> This thesis will use the historical method to understand the historical context of the energy industry in each country and to analyse the earlier legislation and policies of Australia and Norway in the environment and fossil fuel industry. This will facilitate a better understanding of how legislation and policies have developed through the years. For example, Norway's advantage in the use of RE is built on a legacy of more than a century of extensive development of hydropower for electricity generation while Australia developed a dependence on the coal industry for electricity generation, which greatly affects the different per capita rates of GHGe.

#### *4.2 Legal Transplants*

Legal transplants, also known as 'legal diffusion', are, according to Watson, 'the moving of a rule or a system of law from one country to another, or from one people to another'.<sup>111</sup> Legal transplants take place due to globalisation.<sup>112</sup> Legal transplantation is important for legal evolution and is due to '(i) authority, (ii) prestige and imposition, (iii) chance and necessity, (iv) expected efficacy of the law, and (v) political, economic and reputational

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<sup>109</sup> Mark Van Hoecke, 'Methodology of Comparative Legal Research' (2015) LAW AND METHOD 1, 28.

<sup>110</sup> Mark Van Hoecke, 'Methodology of Comparative Legal Research' (2015) LAW AND METHOD 1, 18.

<sup>111</sup> Alan Watson, *Legal Transplants* (Scottish Academic Press Ltd, 1974) 21.

<sup>112</sup> Irma Johanna Mosquera Valderrame, 'Legal Transplants and Comparative Law' (2003) *International Law* 261, 264.

incentives from the countries and third parties'.<sup>113</sup> At the same time, legal transplants have to be done fairly, considering the interests of the stakeholders involved.

Legal diffusion takes place when 'one legal order, system or tradition influences another in some significant way'.<sup>114</sup> Twining states that legal diffusion is from an advanced legal system (civil or common law) to a system that is less developed, intending to bring technological changes by either 'filling in the gaps or replacing prior local law'.<sup>115</sup>

Comparative law scholars have opposing views on legal transplants. Some scholars are against the concept of legal transplants; Legrand is one of the most prominent who is of the view that 'legal transplants are impossible'.<sup>116</sup> However, the author George Mousourakis asserts that Legrand's view is 'too extreme and betrays an exaggeration of culture diversity'.<sup>117</sup> Watson is of the opposing view, stating that legal transplants are possible.<sup>118</sup> A balance needs to be achieved from these contradictory perspectives. Legal transplants can be ineffective if the political and institutional context of the receiving country is ignored.<sup>119</sup>

This thesis aims to learn from Norwegian legislation and policy to reduce GHGe and achieve the *PA* targets. It does not suggest completely transplanting Norwegian legislation and policy into the Australian system. If Australia were to adopt lessons from Norway's carbon tax and ETS, caution has to be exercised in legal transplants and the correct approach must be developed.

## 5.0 Thesis Structure

The thesis comprises six chapters structured as follows. Chapter 1 explains the international legal and policy framework on climate change: The *United Nations Framework Convention on Climate Change 1992*, *KP 1997*, and the *PA 2015*. It also provides an

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<sup>113</sup> Irma Johanna Mosquera Valderrame, 'Legal Transplants and Comparative Law' (2003) *International Law* 261, 265-268.

<sup>114</sup> William Twining, 'Diffusion of Law: A Global Perspective' (2006) 1 *Journal of Comparative Law* 237, 246.

<sup>115</sup> William Twining, 'Diffusion of Law: A Global Perspective' (2006) 1 *Journal of Comparative Law* 237, 247.

<sup>116</sup> Pierre Legrand, 'The Impossibility of Legal Transplants' (1997) 4 *Maastricht Journal of European and Comparative Law* 111, 114.

<sup>117</sup> George Mousourakis, 'Legal Transplants and Legal Development: A Jurisprudential and Comparative Law Approach' (2013) 54(3) *Acta Juridica Hungarica* 219, 236.

<sup>118</sup> Irma Johanna Mosquera Valderrame, 'Legal Transplants and Comparative Law' (2003) *International Law* 261, 270.

<sup>119</sup> Alan Watson, 'Legal Transplants and Law Reform' (1976) 92 *Law Quarterly Review* 79, 81-82.



explanation of core techniques and terms that will be referred to in this thesis. This chapter will also briefly discuss the sequence of legislation and policies in Australia and Norway.

Chapter 2 examines Australia's previous climate change mitigation legislation and policies that were implemented during different Governments and the current climate change mitigation legislation and policies for GHGe reduction. It analyses whether the legislation and policies introduced by previous political leaders helped Australia to reduce its GHGe in the fossil fuel industry.

Chapter 3 examines Norway's legislation and policy to reduce GHGe. It analyses whether Norway's legislation and policy are reducing its GHGe in the fossil fuel industry. The examination of legislation and policy establishes a framework leading to a comparative discussion in chapters 4-6.

Chapter 4 compares Norway's carbon tax and ETS with Australia's carbon pricing mechanism. This chapter will compare the design features of the Australian ETS and the Norwegian ETS. It will then examine why the Australian ETS experience failed, while the Norwegian regime is regarded as largely successful.

Chapter 5 examines the RE in both countries. Norway is technically more advanced than Australia in RE due to the vast amounts of hydropower it possesses and its experience in hydropower development. Australia is at an advantage by possessing large amounts of wind and solar energy, but the uptake is still low. This chapter discusses the measures being taken by both countries to promote RE in the electricity, transportation, and general industry sectors, and the barriers to RE development which are more prevalent in Australia.

Chapter 6 examines sequestration projects such as CCS and its development in Australia and Norway and the barriers faced by both countries on CCS development. It also shows what Australia can learn from the Norwegian legislation and policies on CCS by comparing how CCS policies have evolved in both countries as a mechanism to reduce GHGe.

This thesis highlights the most important factor, that the development of RE and CCS in Norway are driven by the longer history of a carbon price, but built on a legacy of a century of hydropower development. Australia does not have a carbon price, and relies more on solar and wind energy, which are more recent technologies. This thesis aims to highlight the instruments and legislative framework used by Norway to reduce GHGe. Having a properly designed legislative framework for regulating GHGe is important to assist Australia to achieve

its *PA* targets. One of the most important international legal and policy frameworks is the *PA* which is discussed in the next chapter.

## *Chapter 1: The International Legal and Policy Frameworks*

The United Nations climate change regime is the starting point for international action on the issue of climate change. The regime encompasses three major international legal frameworks: the *United Nations Framework Convention on Climate Change 1992 (UNFCCC 1992)*<sup>1</sup>, the *Kyoto Protocol to the UNFCCC 1997 (KP 1997)*,<sup>2</sup> and the *Paris Agreement 2015 (PA 2015)*<sup>3</sup>.

This chapter will provide an overview of the:

- 1) international legal framework on climate change: The *UNFCCC 1992*, *KP 1997*, and the *PA 2015*,
- 2) definition of important terms and explanation of core techniques, and
- 3) sequence of legislation and policies introduced in Australia and Norway.

### **1.0 International Legal Framework**

#### *1.1 United Nations Framework Convention on Climate Change 1992*

The Intergovernmental Panel on Climate Change (IPCC)<sup>4</sup> confirmed in its Fifth Assessment Report that human activities were increasing greenhouse gases in the atmosphere, leading to global warming and climate change.<sup>5</sup> To address global warming, a legal framework was established, the *UNFCCC* in 1992, which entered into force in March 1994.<sup>6</sup> This is a treaty between States developed to address the issue of climate change.

The *UNFCCC* set out commitments to be followed by the Parties to the Convention: (1) protect the climate system for the present and future generations; (2) pay attention to the 'specific needs and circumstances of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change'; (3) take precautionary

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<sup>1</sup> *United Nations Framework Convention on Climate Change 1992*, opened for signature 09 May 1992, 1771 UNTS 107 (entered into force 21 March 1994) ('*UNFCCC*').

<sup>2</sup> *Kyoto Protocol to the United Nations Framework Convention on Climate Change 1997*, opened for signature 11 December 1997, 2303 UNTS 162 (entered into force 16 February 2005) ('*Kyoto Protocol*').

<sup>3</sup> *Paris Agreement*, opened for signature 12 December 2015, [2016] ATS 24 (entered into force 09 November 2016) ('*Paris Agreement*').

<sup>4</sup> It was established in 1998 by the World Meteorological Association. Source: IPCC, *About the IPCC* (Web Page) <<https://www.ipcc.ch/about/>>.

<sup>5</sup> IPCC, *Climate Change 2013: The Physical Science Basis* (Web Page) <[http://www.climatechange2013.org/images/report/WG1AR5\\_TS\\_FINAL.pdf](http://www.climatechange2013.org/images/report/WG1AR5_TS_FINAL.pdf)>.

<sup>6</sup> United Nations Climate Change, *Status of Ratification of the Convention* (Web Page) <<https://unfccc.int/process/the-convention/what-is-the-convention/status-of-ratification-of-the-convention>>.

measures to 'anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects'; (4) promote sustainable development; and (5) cooperate with each other to address climate change issues.<sup>7</sup>

The Convention sets out measures of reporting and ensuring compliance. In December 1992, Australia ratified the Convention.<sup>8</sup> The objective and purpose of the *UNFCCC* is to stabilise 'greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system'.<sup>9</sup> The commitments of the parties are set out in *UNFCCC 1992* art 4. A conference of the parties was established<sup>10</sup> to monitor compliance to the Convention, examine the obligations regularly, make recommendations if necessary, and take other appropriate measures to promote the 'effective implementation of the Convention'.<sup>11</sup>

The *UNFCCC* sets out no firm commitments for countries to follow to reduce greenhouse gas emissions (GHGe); rather, it sets out guiding principles.<sup>12</sup> One of the main principles laid down by the *UNFCCC* is that parties should protect the climate system 'in accordance with their common but differentiated responsibilities and respective capabilities'.<sup>13</sup> The Convention was a starting point for discussion on climate change; it does not impose legally binding obligations on State parties to reduce GHGe. Rather, it promotes collaboration and focuses on intergovernmental efforts. However, the commitments in *UNFCCC 1992* art 4 are binding obligations under international law. The Convention places the burden on developed countries to take the lead.

The *UNFCCC* principles include the precautionary principle. Although these principles have been set out in the Convention, the 'legal regime remains weak'.<sup>14</sup> As a framework Convention, the *UNFCCC* provides for ongoing development of measures to give effect to its

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<sup>7</sup> *UNFCCC* art 3.

<sup>8</sup> Parliament of Australia, *United Nations Framework Convention on Climate Change (UNFCCC)* (Web Page)

<[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/Browse\\_by\\_Topic/ClimateChangeold/governance/international/unfccc/unfccc](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Browse_by_Topic/ClimateChangeold/governance/international/unfccc/unfccc)>; Sharon Mascher, 'Australia's National Greenhouse Response: Implications for the Energy Sector' (1997) 16 *Australian Mining and Petroleum Law Journal* 126, 126.

<sup>9</sup> *UNFCCC* art 2.

<sup>10</sup> *UNFCCC* art 7(1).

<sup>11</sup> *UNFCCC* art 7(2).

<sup>12</sup> J. Peel, 'Climate Change Law: The Emergence of A New Legal Discipline' (2008) 32 *Melbourne University Law Review* 922, 928.

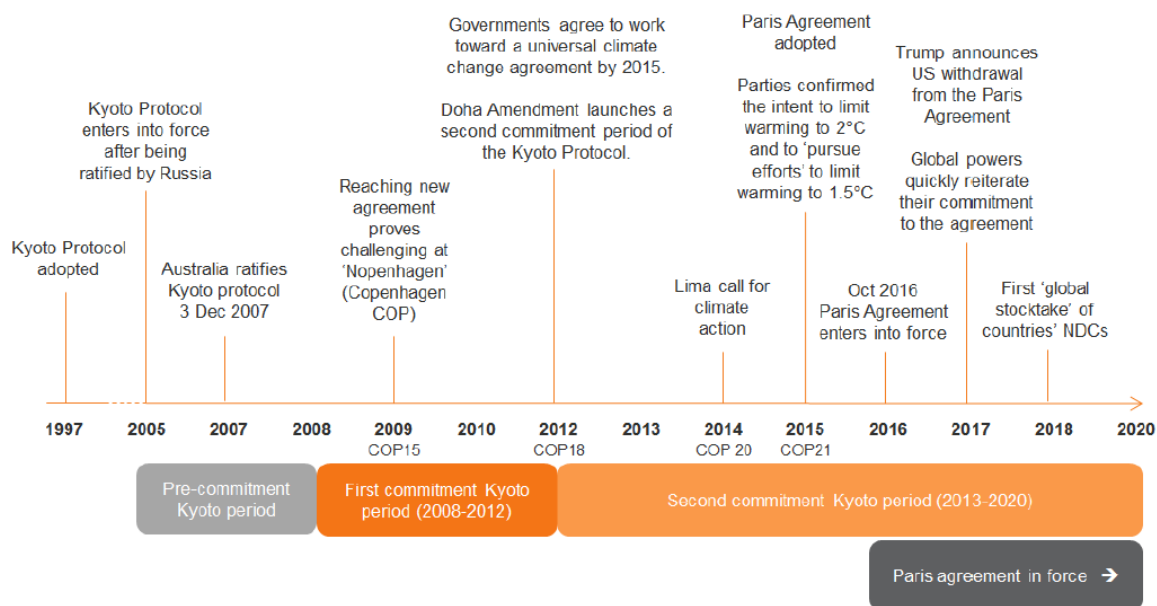
<sup>13</sup> *UNFCCC* art 3(1).

<sup>14</sup> Zahar, Peel and Godden, *Australian Climate Law in Global Context* (Cambridge University Press, 2013) 4.

objectives. The *KP 1997* is one of the most prominent measures adopted to give effect to the *UNFCCC*.<sup>15</sup> Australia signed the *KP* in 1998, but only ratified it on 12 December 2007.<sup>16</sup> Norway ratified the *KP* on 30 May 2002.<sup>17</sup>

## 1.2 Kyoto Protocol to the United Nations Framework Convention on Climate Change 1997

**Figure 1: Timeline of global climate change action<sup>18</sup>**



Conceptually, the *UNFCCC* provided the basic legal principles on an abstract level. The *KP* was a more detailed instrument, as an international agreement adopted in December 1997 and came into force on 16 February 2005.<sup>19</sup> It sets internationally-binding emission reduction targets aimed at reducing 'overall emissions of such gases by at least 5 per cent below 1990 levels in the commitment period 2008 to 2012'.<sup>20</sup> The burden of achieving that

<sup>15</sup> Jacqueline Peel, 'Climate Change Law: The Emergence of a New Legal Discipline' (2008) 32(3) *Melbourne University Law Review* 922, 929, citing Philippe Sands, *Principles of International Environmental Law* (2<sup>nd</sup> ed, 2003).

<sup>16</sup> Parliament of Australia, *The Kyoto Protocol* (Web Page) <[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/Browse\\_by\\_Topic/ClimateChangeold/governance/international/theKyoto](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Browse_by_Topic/ClimateChangeold/governance/international/theKyoto)>.

<sup>17</sup> Norwegian Ministry of the Environment, Parliament of Norway, *Norway's Report on Demonstrable Progress under the Kyoto Protocol Status Report as of December 2005* (Report, December 2005) 6 <<https://unfccc.int/resource/docs/dpr/nor1.pdf>>.

<sup>18</sup> *Global Carbon Offsets Markets Analysis* (Report, 25 July 2017) 6 <[https://www.qld.gov.au/\\_\\_data/assets/pdf\\_file/0029/67925/global-offset-markets-analysis-report.pdf](https://www.qld.gov.au/__data/assets/pdf_file/0029/67925/global-offset-markets-analysis-report.pdf)>.

<sup>19</sup> United Nations Framework Convention on Climate Change, 'Fact Sheet: The Kyoto Protocol' (Web Page) 1 <[https://unfccc.int/files/press/backgrounders/application/pdf/fact\\_sheet\\_the\\_kyoto\\_protocol.pdf](https://unfccc.int/files/press/backgrounders/application/pdf/fact_sheet_the_kyoto_protocol.pdf)>.

<sup>20</sup> *Kyoto Protocol* art 3(1).

reduction falls on Annex I countries,<sup>21</sup> the wealthier, more developed economies. Developing countries were not subject to binding obligations to reduce emissions; rather, they were required to cooperate and share their experience and information.<sup>22</sup>

The *KP* introduced three market mechanisms aimed at distributing cooperative efforts for emissions reduction; namely, the:

- (a) 'joint implementation' mechanism,<sup>23</sup>
- (b) 'clean development mechanism'<sup>24</sup> and
- (c) 'emissions trading'<sup>25</sup>.

The joint implementation mechanism allowed developed country parties to the *UNFCCC*<sup>26</sup> to invest in projects with other developed countries and credit the emission reductions towards their emission reduction targets.<sup>27</sup> A project has to provide a 'reduction in emissions by sources, or an enhancement of removals by sinks, that is additional to any that would otherwise occur'.<sup>28</sup> The projects must have the approval of the parties involved.<sup>29</sup>

The clean development mechanism (CDM) allows developed countries to take credit for their 'certified emission reductions' resulting from projects that are undertaken in developing countries.<sup>30</sup> The certified emissions reduction can be traded and sold.<sup>31</sup> In order to be eligible, there must be voluntary participation, real long-term benefits related to the mitigation of climate change and other additional reductions of emissions that would occur in the absence of a certified project activity.<sup>32</sup> The CDM is used to reduce emissions, while giving industrialised countries the flexibility in meeting their emissions reduction targets.

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<sup>21</sup> According to *Kyoto Protocol* art 1, 'Party included in Annex I' is a Party in Annex I of the Convention. Annex I of the Convention provides a list of countries which includes Australia, Austria, Belarus, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Denmark, European Economic Community, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Liechtenstein, Lithuania, Luxembourg, Monaco, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland, and United States of America.

<sup>22</sup> *Kyoto Protocol* art 2(1)(b).

<sup>23</sup> *Kyoto Protocol* art 6.

<sup>24</sup> *Kyoto Protocol* art 12.

<sup>25</sup> *Kyoto Protocol* art 17.

<sup>26</sup> The list of Parties to the *UNFCCC* are listed in Annex I of the *UNFCCC 1992*.

<sup>27</sup> *Kyoto Protocol* art 6.

<sup>28</sup> *Kyoto Protocol* art 6(1)(b).

<sup>29</sup> *Kyoto Protocol* art 6(1)(a).

<sup>30</sup> *Kyoto Protocol* art 12(3)(b).

<sup>31</sup> UNFCCC, *What is the CDM* (Web Page) <<https://cdm.unfccc.int/about/index.html>>.

<sup>32</sup> *Kyoto Protocol* art 12(5)(a)-(c).

In terms of emissions trading, it allows countries to trade (i.e. buy and sell) emissions units provided it falls under the cap that is set.<sup>33</sup> Emissions trading does not work without an emissions cap. The European Union emissions trading scheme (ETS) is an example. Australia attempted to establish an ETS, but the attempt was unsuccessful.

The *KP* was argued as a 'fundamentally flawed agreement'.<sup>34</sup> It lacked a proper system of enforceability, monitoring and supervision, and compliance to ensure that the countries took proper measures to reduce GHGe.<sup>35</sup> There are no consequences for failure to adhere to the *KP* and Convention because these are guiding instruments for countries. However, the emissions reduction targets set are binding under international law and have to be adhered to. Only the Scandinavian countries and a few European countries took it seriously and implemented legislation and policies with a view of reducing GHGe as early as 1990.<sup>36</sup>

### *1.3 Paris Agreement 2015*

The *Paris Agreement (PA)* came into force on 4 November 2016.<sup>37</sup> Australia ratified the agreement on 10 November 2016.<sup>38</sup> Currently, 184 out of 197 countries have ratified the *PA*.<sup>39</sup> This agreement is legally binding as international law for the parties that have ratified it, though it contains a mixture of binding procedural obligations and provisions for non-binding commitments as to the level of promised reductions in GHGe.<sup>40</sup> The procedures of monitoring, reporting and reviewing the nationally determined contributions (NDC) every five years are binding obligations. However, the content of the NDC, that is, how much the country commits to reduce by, is not binding. The *PA* was structured differently to address the flaws of the *KP*.

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<sup>33</sup> *Kyoto Protocol* art 17 relates to emissions trading.

<sup>34</sup> A.M. Rosen, 'The Wrong Solution at the Right Time: The Failure of the Kyoto Protocol on Climate Change' (2015) 43(1) *Politics & Policy* 30, 30.

<sup>35</sup> A.M. Rosen, 'The Wrong Solution at the Right Time: The Failure of the Kyoto Protocol on Climate Change' (2015) 43(1) *Politics & Policy* 30, 34-40; Laura Horn, 'The Kyoto Protocol: Australia's Commitment and Compliance' (2001) 24(2) *UNSW Law Journal* 583, 586.

<sup>36</sup> Finland was the first country to adopt a carbon tax in 1990. Norway introduced a carbon tax in 1991 and the relevant legislation is the *CO<sub>2</sub> Tax Act 1991*. Source: J. Sumner et al, *Carbon Taxes: A Review of Experience and Policy Design Considerations* (Report, December 2009) 1 <<https://www.nrel.gov/docs/fy10osti/47312.pdf>>.

<sup>37</sup> United Nations Climate Change, *The Paris Agreement* (Web Page) <<https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>>.

<sup>38</sup> Parliament of Australia, *Paris Climate Agreement: A Quick Guide* (Web Page, 10 November 2017) <[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/pubs/rp/rp1718/Quick\\_Guides/ParisAgreement](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/rp1718/Quick_Guides/ParisAgreement)>.

<sup>39</sup> United Nations Climate Change, *The Paris Agreement* (Web Page) <<https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>>.

<sup>40</sup> D Klein et al (eds), *The Paris Agreement on Climate Change: Analysis and Commentary* (Oxford University Press, 2017) 97-102.

These flaws include: (1) problem in the design features (i.e. the structure of the regime was unable to meet the objectives set), (2) emissions reduction targets being 'static targets' (i.e. absence of long-term emission reduction goals), and (3) poor administration of how emission reductions were calculated.<sup>41</sup> The *PA* does not set prescribed country-specific emissions targets like the *KP*. Instead, each country that has ratified the *PA* is required to submit their own NDCs.<sup>42</sup> Australia's target is '26 to 28 per cent below 2005 levels by 2030' GHGe reduction.<sup>43</sup> Norway, however, targets to reduce GHGe by '40% per cent below 1990 by 2030'.<sup>44</sup> Norway's targets are more ambitious than Australia. Parties are not obliged to fulfil the NDCs but have to take substantial efforts to meet their NDCs.<sup>45</sup>

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<sup>41</sup> A.M. Rosen, 'The Wrong Solution at the Right Time: The Failure of the Kyoto Protocol on Climate Change' (2015) 43(1) *Politics & Policy* 30, 40-42.

<sup>42</sup> *Paris Agreement* art 4(2) and 4(3).

<sup>43</sup> Australian Government Department of Industry, Science, Energy and Resources, *Australia's 2030 Climate Change Target* (Web Page) <<https://www.environment.gov.au/climate-change/publications/factsheet-australias-2030-climate-change-target>>.

<sup>44</sup> Climate Action Tracker, *Norway Pledges and Targets* (Web Page) <<https://climateactiontracker.org/countries/norway/pledges-and-targets/>>.

<sup>45</sup> R Bodle, L Donat and M Duwe, 'The Paris Agreement: Analysis, Assessment and Outlook' (Web Page, 28 January 2016) 8 <[https://www.ecologic.eu/sites/files/event/2016/ecologic\\_institute\\_2016\\_paris\\_agreement\\_assessment.pdf](https://www.ecologic.eu/sites/files/event/2016/ecologic_institute_2016_paris_agreement_assessment.pdf)>.



**Figure 2: Adequacy of Paris Agreement NDCs by country<sup>46</sup>**

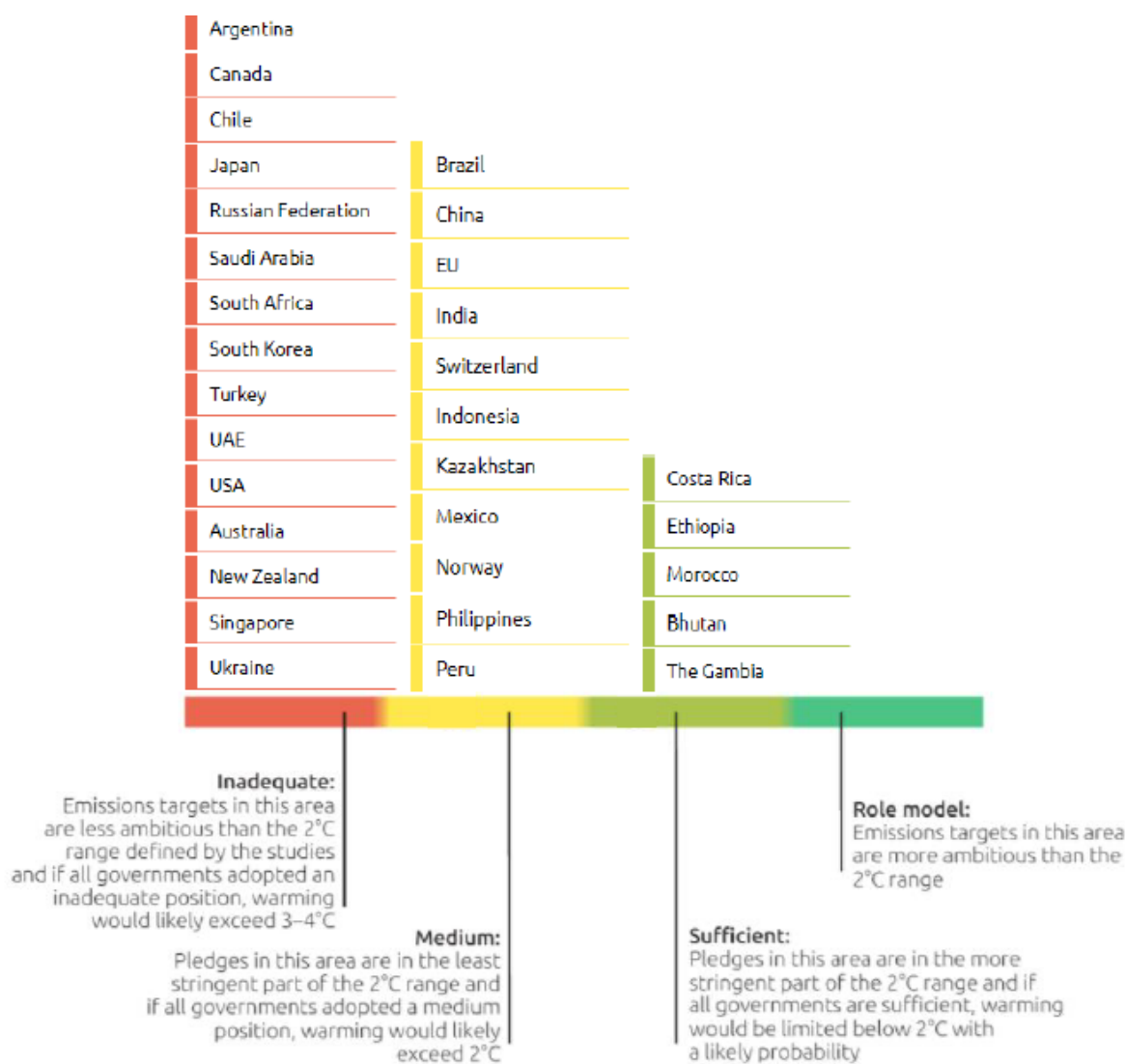


Figure 2 above shows the adequacy of the *PA* NDCs by countries using four different levels (i.e. inadequate, medium, sufficient and role model) on the scale. The figure connotes that Australia’s pledge is inadequate, and Norway’s pledge is at a medium scale. Based on this analysis, Australia would not be able to meet the main goal of the *PA*.

The main goal of the *PA* is to hold ‘the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels’,<sup>47</sup> known as the global temperature goal. As parties to the *PA*, Australia and Norway are obliged to:

<sup>46</sup> *Global Carbon Offsets Markets Analysis* (Report, 25 July 2017) 8  
[https://www.qld.gov.au/\\_\\_data/assets/pdf\\_file/0029/67925/global-offset-markets-analysis-report.pdf](https://www.qld.gov.au/__data/assets/pdf_file/0029/67925/global-offset-markets-analysis-report.pdf).

<sup>47</sup> *Paris Agreement* art 2(1)(a).

- 1) 'strengthen the global response to the threat of climate change by keeping a global temperature rise this century well below 2.0 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius';<sup>48</sup>
- 2) implement national policies to reduce emissions and adapt to the impacts of climate change;<sup>49</sup>
- 3) give their best efforts by declaring and implementing NDC's;<sup>50</sup> and
- 4) regularly report their progress on their emissions and what efforts have been implemented to regulate and reduce the GHGe.<sup>51</sup>

Every five years a global stock take will occur to determine how the Parties have progressed in achieving the aim of the agreement, and parties will have to submit their new NDCs.<sup>52</sup> The first global stock take is to take place in 2023.<sup>53</sup>

On 1 June 2017, United States (US) President Donald Trump announced plan to withdraw the US from the *PA* and to 'begin negotiations to reenter either the Paris Accord or a really entirely new transaction on terms that are fair to the United States'.<sup>54</sup> This decision was criticised by many countries and leaders, who strongly asserted that the *PA* and the international resolution to respond towards climate change will still remain.

The US has given notice that it will withdraw from the *PA*. This decision to withdraw is part of President Trump's skeptical view on climate change, believing that it is a 'hoax'.<sup>55</sup> President Trump strongly believes that the withdrawal is necessary on the basis that the *PA* is harmful to the US and could affect the economy, causing job losses<sup>56</sup> because the US is

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<sup>48</sup> *Paris Agreement* art 2(1) and 2(1)(a); United Nations Framework Convention on Climate Change, *Climate Get The Big Picture* (Web Page) <<http://bigpicture.unfccc.int/#content-the-paris-agreemen>>.

<sup>49</sup> *Paris Agreement* art 4(2); United Nations Framework Convention on Climate Change, *Climate Get The Big Picture* (Web Page) <<http://bigpicture.unfccc.int/#content-the-paris-agreemen>>.

<sup>50</sup> *Paris Agreement* art 3; United Nations Framework Convention on Climate Change, *Climate Get The Big Picture* (Web Page) <<http://bigpicture.unfccc.int/#content-the-paris-agreemen>>.

<sup>51</sup> *Paris Agreement* art 3; United Nations Framework Convention on Climate Change, *Climate Get The Big Picture* (Web Page) <<http://bigpicture.unfccc.int/#content-the-paris-agreemen>>.

<sup>52</sup> *Paris Agreement* art 4 and 14.

<sup>53</sup> *Paris Agreement* art 14(2).

<sup>54</sup> White House, *Statement by President Trump on the Paris Climate Accord* (Web Page) <<https://www.whitehouse.gov/briefings-statements/statement-president-trump-paris-climate-accord/>>.

<sup>55</sup> Z. Hai-Bin et al, 'U.S Withdrawal from the Paris Agreement: Reasons, Impacts, and China's Response' (2017) 8 *Advances in Climate Change Research* 220, 221; Z. Yong-Zhiang et al, 'The Withdrawal of the U.S from the Paris Agreement and Its Impact on Global Climate Change Governance' (2017) 8 *Advances in Climate Change Research* 213, 214.

<sup>56</sup> Z. Yong-Zhiang, C Qing-Chen, Z. Qiu-Hong, and H. Lei, 'The Withdrawal of the U.S from the Paris Agreement and Its Impact on Global Climate Change Governance' (2017) 8 *Advances in Climate Change Research* 213, 214.

actively involved in the fossil fuel industry. Due to its active involvement, the Trump administration is of the view that supporting the *PA* would jeopardise the economy.

According to *PA 2015* art 28, parties cannot withdraw from the *PA* for the first three years. This would mean the withdrawal process can start in November 2019, and the earliest date US can withdraw is 4 November 2020.<sup>57</sup> The withdrawal will take effect one year after the Depository receives the notification of withdrawal.<sup>58</sup>

Many authors opine that the US withdrawal from the *PA* will not have a major impact on the world in addressing the issue of climate change.<sup>59</sup> However, some are of the view that the withdrawal would disrupt global climate cooperation towards climate change.<sup>60</sup> The US withdrawal will make it more difficult for the world to achieve the *PA* goals.<sup>61</sup>

There are continuous efforts by other countries that have ratified the *PA*, to reduce GHGe, despite the US view to withdraw. In Australia, many organisations predicted that Australia will be unable to meet its Paris targets.<sup>62</sup> Meeting the targets will depend on the effectiveness of the legislation and policy in place to reduce GHGe.

## 2.0 Explanation of Core Techniques and Terms

The international legal frameworks leave countries with choices about how to implement the international obligations and the following discussions explore some of the core policy choices open to nation States. This is explained in more detail in Chapters 2 and 3. For

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<sup>57</sup> J. Pickering et al, 'The Impact of the US Retreat from the Paris Agreement: Kyoto Revisited?' (2018) 18(7) *Climate Policy* 818, 823.

<sup>58</sup> *Paris Agreement* art 28(2).

<sup>59</sup> David Robinson, *The Significance of the US Withdrawal from the Paris Agreement on Climate Change* (Web Page, June 2017) 11 <<https://www.oxfordenergy.org/wpcms/wp-content/uploads/2017/06/The-Significance-of-the-US-Withdrawal-from-the-Paris-Agreement-on-Climate-Change.pdf>>.

<sup>60</sup> Z. Hai-Bin, D. Hai-Cheng, H. Lai and W. Wen-Tao, 'U.S Withdrawal from the Paris Agreement: Reasons, Impacts, and China's Response' (2017) 8 *Advances in Climate Change Research* 220, 221; Z. Yong-Zhiang, C Qing-Chen, Z. Qiu-Hong, and H. Lei, 'The Withdrawal of the U.S from the Paris Agreement and Its Impact on Global Climate Change Governance' (2017) 8 *Advances in Climate Change Research* 213, 223.

<sup>61</sup> Matt McGrath, 'Five Effects Of US Pullout From Paris Climate Deal', *BBC News* (Web Page, 1 June 2017) <<https://www.bbc.com/news/science-environment-40120770>>.

<sup>62</sup> Huge Saddler, 'National Energy Emissions Audit March 2018', (Web Page, March 2018) 7 <<http://www.tai.org.au/sites/default/files/National%20Energy%20Emissions%20Audit%20March%202018.pdf>>; United Nations Environment Programme, 'The Emissions Gap Report 2017', (Web Page) <[http://wedocs.unep.org/bitstream/handle/20.500.11822/22070/EGR\\_2017.pdf?isAllowed=y&sequence=1](http://wedocs.unep.org/bitstream/handle/20.500.11822/22070/EGR_2017.pdf?isAllowed=y&sequence=1)>; B. Hare et al, *Western Australia's Gas Gamble: Implications of Exploiting Canning Basin and other Unconventional Gas Resources for Achieving Climate Targets* (Report, March 2018) 8 <<https://climateanalytics.org/media/climateanalytics-report-westernaustraliasgasgamble-2018.pdf>>.

clarity, the definition and meaning of carbon tax, emissions trading scheme (ETS), cap and trade, baseline-and-credit system, project-based scheme and hybrid scheme are provided below.

## *2.1 Difference Between Carbon Tax and Emissions Trading Scheme*

### *2.1.1 Carbon Tax*

A carbon tax 'works by sending a price signal: it effectively places a levy on the price of a product that (in an ideal world) should reflect the social cost of the associated GHG pollution'.<sup>63</sup> In this system, there is no cap on emissions; it is the amount of tax that affects the level of emissions. Therefore, businesses are forced to consider the cost of their emissions. They will need to choose whether to invest in reducing their emissions or risk losing market share for their product if the price is increased to cover the cost of tax.

### *2.1.2 Emissions Trading Scheme*

An ETS functions by having a cap on emissions and requires the emitters to hold a permit for each tonne of CO<sub>2</sub> they emit. It controls the quantity of emission permits rather than the price.<sup>64</sup> The number of permits reduces over a period of time. There are four types of ETS: cap and trade system, baseline-and-credit, project-based schemes and hybrid schemes.<sup>65</sup>

#### *2.1.2(a) Cap and Trade System*

The cap and trade system 'creates a system of tradeable permits allowing a set amount of emissions to be made'.<sup>66</sup> In this system, the market determines the best way to control

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<sup>63</sup> Zahar, Peel and Godden, *Australian Climate Law in Global Context* (Cambridge University Press, 2013) 171.

<sup>64</sup> Zahar, Peel and Godden, *Australian Climate Law in Global Context* (Cambridge University Press, 2013) 171.

<sup>65</sup> Parliament of Australia, *Emissions Trading* (Web Page) <[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/Browse\\_by\\_Topic/ClimateChangeold/responses/economic/emissions/emissionstrade](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Browse_by_Topic/ClimateChangeold/responses/economic/emissions/emissionstrade)>, archived at <[https://web.archive.org/web/20190524102935/https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/Browse\\_by\\_Topic/ClimateChangeold/responses/economic/emissions/emissionstrade](https://web.archive.org/web/20190524102935/https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Browse_by_Topic/ClimateChangeold/responses/economic/emissions/emissionstrade)>; Ross Garnaut, *Garnaut Climate Change Review* (Cambridge University Press, 2008) 308-310.

<sup>66</sup> Parliament of Australia, *Emissions Trading* (Web Page) <[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/Browse\\_by\\_Topic/ClimateChangeold/responses/economic/emissions/emissionstrade](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Browse_by_Topic/ClimateChangeold/responses/economic/emissions/emissionstrade)>, archived at <[https://web.archive.org/web/20190524102935/https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/Browse\\_by\\_Topic/ClimateChangeold/responses/economic/emissions/emissionstrade](https://web.archive.org/web/20190524102935/https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Browse_by_Topic/ClimateChangeold/responses/economic/emissions/emissionstrade)>; Ross Garnaut, *Garnaut Climate Change Review* (Cambridge University Press, 2008) 308-310.

pollution within a regulatory framework. An example of the cap and trade system is the European Union ETS (EU ETS).<sup>67</sup> Chapter 3 highlights the key features of the EU ETS: (a) targets/cap; (b) sector of coverage; (c) allocation of allowances; and (d) linking with other systems. Under the EU ETS, allowances are created giving the emitter the right to emit GHGe equivalent to 1 tonne of CO<sub>2</sub>-e.<sup>68</sup> The cap level determines the number of allowances in the system.

In Australia, the Carbon Pollution Reduction Scheme (CPRS) was a cap and trade ETS which places a limit and cap on emissions. This scheme never entered into law. Significant advantages of a cap and trade scheme include broad coverage of sectors, incentives, credibility, and flexibility.<sup>69</sup> There are also significant disadvantages of a cap and trade system which include increases in cost for businesses, rising prices of goods, and difficulty in gaining support from politicians and the public.<sup>70</sup>

### *2.1.2(b) Baseline-and-credit System*

In the baseline-and-credit system, a certain amount of allowed emissions is allocated to the participating emitters, which is called the 'baseline level of emissions'.<sup>71</sup> In Australia, the baseline-and-credit system is called the Safeguard Mechanism.<sup>72</sup> Under this mechanism, in order to emit above the baseline, participants are required to surrender an appropriate number of emission credits. Facilities that emit below their baseline and have carried out offset projects in their facility or at another facility can earn emission credits and are allowed to bank in those credits.<sup>73</sup>

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<sup>67</sup> The EU ETS is discussed in greater detail in Chapter 3.

<sup>68</sup> European Commission, *EU ETS Handbook* (European Union, 2015) 16.

<sup>69</sup> Tony Wood and David Blowers, 'Climate phoenix, A sustainable Australian climate policy', *Grattan Institute* (Web Page, April 2016) 10-11 <<https://grattan.edu.au/wp-content/uploads/2016/04/870-Climate-Phoenix.pdf>>.

<sup>70</sup> Tony Wood and David Blowers, 'Climate phoenix, A sustainable Australian climate policy', *Grattan Institute* (Web Page, April 2016) 11-12 <<https://grattan.edu.au/wp-content/uploads/2016/04/870-Climate-Phoenix.pdf>>.

<sup>71</sup> Parliament of Australia, *Emissions Trading* (Web Page) <[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/Browse\\_by\\_Topic/ClimateChangeold/responses/economic/emissions/emissionstrade](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Browse_by_Topic/ClimateChangeold/responses/economic/emissions/emissionstrade)>, archived at <[https://web.archive.org/web/20190524102935/https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/Browse\\_by\\_Topic/ClimateChangeold/responses/economic/emissions/emissionstrade](https://web.archive.org/web/20190524102935/https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Browse_by_Topic/ClimateChangeold/responses/economic/emissions/emissionstrade)>;

<sup>72</sup> The Safeguard Mechanism is discussed in Chapter 2 section 3.2.2.

<sup>73</sup> *National Greenhouse and Energy Reporting Act 2007* (Cth) s 22XK.

### 2.1.2(c) Project-based Scheme

The project-based scheme means carrying out emissions-reduction projects in other countries. It aims at reducing overall cost, enabling offsets and reducing unwanted GHGe, called flexible mechanisms.<sup>74</sup> Examples of these mechanisms are the Clean Development Mechanism (i.e. carrying out emissions-reduction projects in developing countries) and Joint Implementation (i.e. enabling Annex B countries<sup>75</sup> with a specific emissions reduction target to obtain credit for projects carried out in other Annex B countries) under the *KP 1997*.

### 2.1.2(d) Hybrid Scheme

A hybrid scheme is a combination of approaches (i.e. carbon tax and cap and trade schemes).<sup>76</sup> An example of a hybrid scheme is the carbon pricing mechanism (CPM) in Australia. The CPM was unique in the sense that it included a carbon price and a transition point to ETS.<sup>77</sup>

## 2.2 Advantages and Disadvantages of a Carbon Tax

Both economic instruments (carbon tax and ETS) have their advantages and disadvantages. Some of the significant advantages of the carbon tax include stability, abatement at low cost for certain covered sectors, some level of certainty as to the carbon prices, predictable revenue flow as there is a fixed price on carbon, encourage the use of

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<sup>74</sup> Parliament of Australia, *Emissions Trading* (Web Page)

<[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/Browse\\_by\\_Topic/ClimateChangeold/responses/economic/emissions/emissionstrade](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Browse_by_Topic/ClimateChangeold/responses/economic/emissions/emissionstrade)>, archived at <[https://web.archive.org/web/20190524102935/https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/Browse\\_by\\_Topic/ClimateChangeold/responses/economic/emissions/emissionstrade](https://web.archive.org/web/20190524102935/https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Browse_by_Topic/ClimateChangeold/responses/economic/emissions/emissionstrade)>.

<sup>75</sup> Annex B countries according to the *Kyoto Protocol* include Australia, Austria, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Denmark, Estonia, European Community, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Liechtenstein, Lithuania, Luxembourg, Monaco, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine, United Kingdom of Great Britain and Northern Ireland, and United States of America.

<sup>76</sup> Parliament of Australia, *Emissions Trading* (Web Page)

<[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/Browse\\_by\\_Topic/ClimateChangeold/responses/economic/emissions/emissionstrade](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Browse_by_Topic/ClimateChangeold/responses/economic/emissions/emissionstrade)>, archived at <[https://web.archive.org/web/20190524102935/https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/Browse\\_by\\_Topic/ClimateChangeold/responses/economic/emissions/emissionstrade](https://web.archive.org/web/20190524102935/https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Browse_by_Topic/ClimateChangeold/responses/economic/emissions/emissionstrade)>.

<sup>77</sup> The opposition of the CPM often described it as a carbon tax. However, in actual fact, it was a carbon price. This is discussed in more detail in Chapter 2.

alternative energy, revenue generated can be used for environmental programmes, fast implementation, transparent, simple, and it can be used widely across different economies.<sup>78</sup>

A carbon tax also has disadvantages, including: uncertain outcomes (that is, uncertainty in levels of reduction of GHGe), the possibility of turning away investors, increasing costs for businesses, increased electricity prices for consumers, difficulty setting a price for carbon (explicitly called a 'tax') that will produce the desired level of abatement, and difficulty in gaining political and public support.<sup>79</sup>

### *2.3. Advantages and Disadvantages of an Emissions Trading Scheme*

As for the ETS, significant advantages include: environmental effectiveness, flexibility (i.e. allows participants to decide when and where to invest in abatement), cost effective abatement, promoting innovation and use of low carbon technology, generating revenue for the government that can be used to fund projects reducing emissions, political feasibility, and certainty on carbon pollution targets.<sup>80</sup> Disadvantages of the ETS include: uncertainty about the carbon price, time taken for implementation, requirement for regulation, possibility of purchasing cheap offsets or carbon credits, and susceptibility to fraud.<sup>81</sup>

As seen above, both systems have their benefits and drawbacks. However, many groups seem to have favoured an ETS rather than a carbon tax.<sup>82</sup> The Garnaut Climate

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<sup>78</sup> Joel Wood, 'The Pros and Cons of Carbon Taxes and Cap-and-Trade Systems' (2018) 11(30) *The School of Public Policy Publications* 4-5, 7, 10, 12; Zahar, Peel and Godden, *Australian Climate Law in Global Context* (Cambridge University Press, 2013) 172; Sarah Dowdey, *How Carbon Tax Works* <<https://science.howstuffworks.com/environmental/green-science/carbon-tax1.htm>>; Parliament of Australia, *Carbon Taxes* (Web Page)

<[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/Browse\\_by\\_Topic/ClimateChangeold/responses/economic/carbontax](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Browse_by_Topic/ClimateChangeold/responses/economic/carbontax)>.

<sup>79</sup> Zahar, Peel and Godden, *Australian Climate Law in Global Context* (Cambridge University Press, 2013) 172; Robson A, 'Australia's Carbon Tax: An Economic Evaluation' (2014) 34(1) *Economic Affairs* 35, 35-36; Ken Chan, 'Don't forget the weather in the axing of the carbon tax in Australia' (2015) 6(1) *Carbon Management* 63-68; Parliament of Australia, *Carbon Taxes* (Web Page) <[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/Browse\\_by\\_Topic/ClimateChangeold/responses/economic/carbontax](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Browse_by_Topic/ClimateChangeold/responses/economic/carbontax)>; Tony Wood and David Blowers, 'Climate Phoenix, A Sustainable Australian Climate Policy' (Web Page, April 2016) <<https://grattan.edu.au/wp-content/uploads/2016/04/870-Climate-Phoenix.pdf>> 15.

<sup>80</sup> Zahar, Peel and Godden, *Australian Climate Law in Global Context* (Cambridge University Press, 2013) 172; Alexander Eden et al, 'Benefits of Emissions Trading: Taking Stock Of The Impacts of Emissions Trading Systems Worldwide' (Web Page, August 2018) <[https://icapcarbonaction.com/en/?option=com\\_attach&task=download&id=389](https://icapcarbonaction.com/en/?option=com_attach&task=download&id=389)>.

<sup>81</sup> Zahar, Peel and Godden, *Australian Climate Law in Global Context* (Cambridge University Press, 2013) 172; Steve Richey, *The Pros and Cons of Cap and Trade* (Web Page) <<http://www.steverichey.com/writing-samples/climate-change/the-pros-and-cons-of-cap-and-trade/>>.

<sup>82</sup> Parliament of Australia, *Carbon Taxes* (Web Page) <[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/Browse\\_by\\_Topic/ClimateChangeold/responses/economic/carbontax](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Browse_by_Topic/ClimateChangeold/responses/economic/carbontax)>.

Change Review also preferred an ETS over a carbon tax.<sup>83</sup> Whether a carbon tax or an ETS; 'both will only be effective if they are stringent and designed well'.<sup>84</sup>

### 3.0 Sequence of Policies

This section briefly discusses the significant legislation and policy introduced in Australia and Norway during different governments. The legislative details will be omitted here because they are discussed in depth in Chapters 2 and 3.

#### 3.1 Australia

There are four main parties represented in the Australian House of Representatives: the Australian Labor Party, the Liberal Party of Australia, the National Party of Australia, and the Greens. The Australian Labor Party is the oldest political party, established in 1901,<sup>85</sup> focusing on fairness at work, quality education and equal opportunities for all.<sup>86</sup> The Liberal Party was established in 1944<sup>87</sup> which focuses on building a strong economy.<sup>88</sup> The National Party was formed in 1920 known as The Country Party<sup>89</sup> aiming to build a strong regional Australia.<sup>90</sup> The Liberal Party and the National Party are in Coalition. The Greens were formed in 1992,<sup>91</sup> focusing on protecting the environment.<sup>92</sup> The timeline below provides a brief explanation of the main parties in Australia and their Prime Ministers in power.<sup>93</sup>

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<sup>83</sup> Ross Garnaut, *Garnaut Climate Change Review* (Cambridge University Press, 2008) 227-229, 307-311.

<sup>84</sup> R. Cleetus, 'Finding Common Ground in the Debate between Carbon Tax and Cap-and-Trade Policies' (2011) 67(1) *Bulletin of the Atomic Scientists* 19, 23.

<sup>85</sup> Parliament of Australia, *Infosheet 22 – Political Parties* (Web Page) <[https://www.aph.gov.au/About\\_Parliament/House\\_of\\_Representatives/Powers\\_practice\\_and\\_procedure/00\\_-\\_Infosheets/Infosheet\\_22\\_-\\_Political\\_parties](https://www.aph.gov.au/About_Parliament/House_of_Representatives/Powers_practice_and_procedure/00_-_Infosheets/Infosheet_22_-_Political_parties)>.

<sup>86</sup> Labor, *The Australian Labor Party* (Web Page) <<https://www.alp.org.au/about/about/>>.

<sup>87</sup> Parliament of Australia, *Infosheet 22 – Political Parties* (Web Page) <[https://www.aph.gov.au/About\\_Parliament/House\\_of\\_Representatives/Powers\\_practice\\_and\\_procedure/00\\_-\\_Infosheets/Infosheet\\_22\\_-\\_Political\\_parties](https://www.aph.gov.au/About_Parliament/House_of_Representatives/Powers_practice_and_procedure/00_-_Infosheets/Infosheet_22_-_Political_parties)>.

<sup>88</sup> Liberal, *The Liberal Party of Australia* (Web Page) <<https://www.liberal.org.au>>.

<sup>89</sup> Parliament of Australia, *Infosheet 22 – Political Parties* (Web Page) <[https://www.aph.gov.au/About\\_Parliament/House\\_of\\_Representatives/Powers\\_practice\\_and\\_procedure/00\\_-\\_Infosheets/Infosheet\\_22\\_-\\_Political\\_parties](https://www.aph.gov.au/About_Parliament/House_of_Representatives/Powers_practice_and_procedure/00_-_Infosheets/Infosheet_22_-_Political_parties)>.

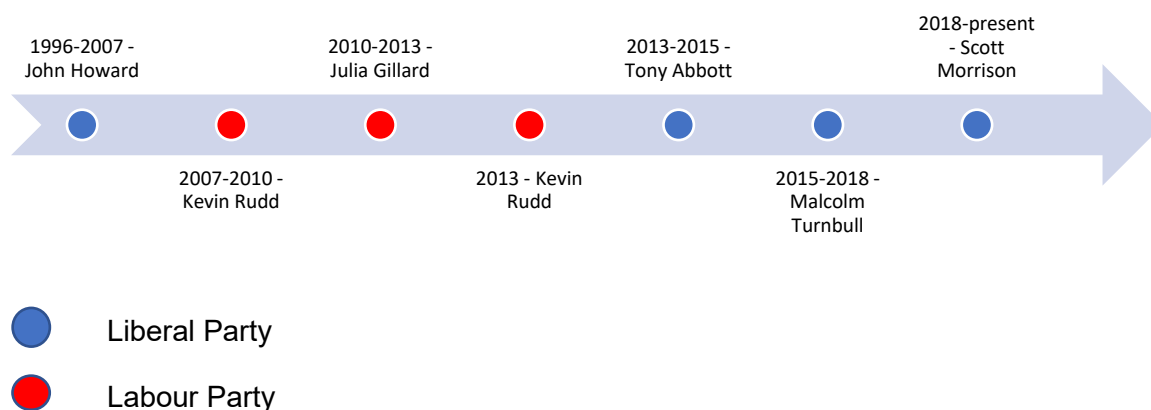
<sup>90</sup> The Nationals for Regional Australia, *What We Stand For* (Web Page) <<http://nationals.org.au/about/what-we-stand-for/>>.

<sup>91</sup> The Greens, *Our Story* (Web Page) <<https://greens.org.au/about/our-story>>.

<sup>92</sup> The Greens, *Your Movement* (Web Page) <<https://greens.org.au>>.

<sup>93</sup> National Archives of Australia, *Australia's Prime Ministers* (Web Page) <<http://primeministers.naa.gov.au/primeministers/>>.





As GHGe became a highly debated issue in the last two decades, different political parties introduced different measures, attempting to reduce GHGe. This discussion will start from the late 1990s until the present. Prime Minister John Howard was in power from March 1996-December 2007<sup>94</sup> and during this time, there was strong resistance to regulating GHGe. For the most part, only voluntary measures were advocated, as outlined in the National Greenhouse Strategy 1998.<sup>95</sup>

Later in the term of his Government, the Parliament enacted the *Renewable Energy (Electricity) Act 2000* (Cth) (as amended) and the *National Greenhouse and Energy Reporting Act 2007* (Cth). This led to the creation of the following legislation and policies being passed: (a) Mandatory Renewable Energy Target; and (b) National Greenhouse and Energy Reporting (NGER) scheme. The change of approach was due to the significant drought that happened in 2007. Only after this incident, there were rising concerns over climate change.

The Rudd Government was in power from December 2007-June 2010.<sup>96</sup> The first step made by the Rudd Government was ratifying the *KP* on 12 December 2007.<sup>97</sup> This Government also proposed the CPRS, to operate as a national emissions cap and trade scheme. The CPRS was not pursued and there was a change in policy when Gillard took over. The Gillard Government introduced a significant policy that was highly controversial.

<sup>94</sup> National Archives of Australia, *Australia's Prime Ministers Timeline* (Web Page) <<http://primeministers.naa.gov.au/timeline/results.aspx?type=pm&pm=John%20Howard>>.

<sup>95</sup> Commonwealth of Australia, *The National Greenhouse Strategy* (Report, 1998) ix <[http://www2.eie.ucr.ac.cr/~jromero/sitio-TCU-oficial/normativa/archivos/leyes\\_int/green\\_house.pdf](http://www2.eie.ucr.ac.cr/~jromero/sitio-TCU-oficial/normativa/archivos/leyes_int/green_house.pdf)>.

<sup>96</sup> Australian Prime Ministers, *Kevin Rudd* (Web Page) <<https://primeministers.moadoph.gov.au/prime-ministers/kevin-rudd>>.

<sup>97</sup> Parliament of Australia, *The Kyoto Protocol* (Web Page) <[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/Browse\\_by\\_Topic/ClimateChangeold/governance/international/theKyoto](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Browse_by_Topic/ClimateChangeold/governance/international/theKyoto)>.

The Gillard Government was in power from June 2010-June 2013.<sup>98</sup> Prime Minister Gillard could only form government with the Greens and two independent members, who made the enactment of a carbon pricing scheme a condition of their support.<sup>99</sup> The Gillard Government introduced the carbon pricing mechanism (CPM). The Parliament of Australia passed the clean energy package of legislation at the end of 2011 which included the *Clean Energy Act (CEA) 2011 (Cth)*, *Clean Energy Regulator Act 2011 (Cth)* and the *Climate Change Authority Act 2011 (Cth)*.<sup>100</sup>

However, in 2014, the CPM and its associated legislation were repealed, after Tony Abbott became Prime Minister. Abbott was in power from September 2013-September 2015.<sup>101</sup> The Abbott Government replaced the CPM with the Direct Action Plan (DAP). The main aspect of that Plan was the Emissions Reduction Fund (ERF), a voluntary scheme consisting of taxpayer funded projects to sequester and reduce emissions. This fund is still operating. The Abbott Government policies led to uncertainty about the efforts to reduce GHGe.

Malcolm Turnbull was in power from September 2015-August 2018.<sup>102</sup> Turnbull stated that 'Paris is not the end of the journey'<sup>103</sup> and added that it is a 'step along the way to achieving a net zero-emissions world.'<sup>104</sup> Therefore, measures have to be taken at an initial stage in order to achieve the net zero emissions target.

During the Turnbull Government, the Safeguard Mechanism (SM) was introduced to work as part of the ERF and the Council of Australian Governments adopted the National Energy Productivity Plan (NEPP), which ensures 'energy productivity improves by 40 per cent

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<sup>98</sup> Australian Prime Ministers, *Julia Gillard* (Web Page)

<<https://primeministers.moadoph.gov.au/prime-ministers/julia-gillard>>.

<sup>99</sup> Evgeny Guglyuvatty and Natalie P. Stoianoff, 'Carbon Policy in Australia – A Political History' (2016) *Green Fiscal Reform for a Sustainable Future* 31, 39.

<sup>100</sup> Greg Combet, *Securing a Clean Energy Future: Implementing the Australian Government's Climate Change Plan* (CanPrint Communications Pty Ltd, 2012) 5-6  
<[https://archive.budget.gov.au/2012-13/ministerial\\_statements/ms\\_climate\\_change.pdf](https://archive.budget.gov.au/2012-13/ministerial_statements/ms_climate_change.pdf)>.

<sup>101</sup> Australian Prime Ministers, *Tony Abbott* (Web Page)

<<https://primeministers.moadoph.gov.au/prime-ministers/tony-abbott>>.

<sup>102</sup> National Archives of Australia, *Australia's Prime Ministers* (Web Page)  
<<http://primeministers.naa.gov.au/primeministers/turnbull/>>.

<sup>103</sup> Gatton, Lockyer & Brisbane Valley Star, *Turnbull Says UN Climate Talks 'Not The End Of The Journey'* (Web Page, 30 November 2015) <<https://www.gattonstar.com.au/news/door-left-open-to-lower-emissions/2857636/>>.

<sup>104</sup> Gatton, Lockyer & Brisbane Valley Star, *Turnbull Says UN Climate Talks 'Not The End Of The Journey'* (Web Page, 30 November 2015) <<https://www.gattonstar.com.au/news/door-left-open-to-lower-emissions/2857636/>>.

over the period 2015 to 2030'.<sup>105</sup> The SM requires 'largest emitters to keep emissions within baseline levels'.<sup>106</sup> This will be discussed in detail in Chapter 2.

Prime Minister Turnbull's most significant policy initiative was to draft the National Energy Guarantee (NEG), aiming at reforming the regulation of the national energy grid to stabilise supply, reduce prices and reduce emissions. It was abandoned in September 2018,<sup>107</sup> as pressure from the right wing of the Liberal Party forced Turnbull to do so in an effort to save his Prime Ministership.

In 2018, Scott Morrison became the Prime Minister and remains so.<sup>108</sup> Morrison is of the view that the *PA* targets can be met 'in a canter' i.e. can be met easily.<sup>109</sup> However, the rising levels of GHGe show that it would be difficult for Australia to achieve its *PA* targets with the current national policies. Morrison's claim contradicts Australia's emissions figures.<sup>110</sup>

Australia's current climate change mitigation policies are as follows: (a) ERF; (b) SM; (c) Renewable Energy Target; (d) NGER Scheme; (e) NEPP; and (f) other State-based mechanisms.<sup>111</sup> Currently, it is still uncertain whether the current Prime Minister will improve climate change policies in Australia. This will be discussed in detail in Chapter 2.

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<sup>105</sup> Department of the Environment and Energy, Parliament of Australia, *2017 Review of Climate Change Policies* (Report, December 2017) 6  
<<https://www.environment.gov.au/system/files/resources/18690271-59ac-43c8-ae1-92d930141f54/files/2017-review-of-climate-change-policies.pdf>>.

<sup>106</sup> Australian Government, 'The Safeguard Mechanism – Overview' (Web Page)  
<<https://www.environment.gov.au/system/files/resources/8fb34942-eb71-420a-b87a-3221c40b2d21/files/factsheet-safeguard-mechanism.pdf>> 1.

<sup>107</sup> Guardian staff, 'Scott Morrison Says National Energy Guarantee 'Is Dead'', *The Guardian* (online, 8 September 2018) <<https://www.theguardian.com/australia-news/2018/sep/08/scott-morrison-says-national-energy-guarantee-is-dead>>.

<sup>108</sup> Prime Minister of Australia, *Prime Minister of Australia* (Web Page) <<https://www.pm.gov.au>>; Ben Doherty, 'Australia's New PM Is Scott Morrison As Moderate Malcolm Turnbull Is Forced Out', *The Guardian* (online, 24 August 2018) <<https://www.theguardian.com/australia-news/2018/aug/24/scott-morrison-to-become-australian-pm-as-turnbull-denounces-insurgency>>.

<sup>109</sup> Katherine Murphy, 'Scott Morrison Contradicts Energy Advice, Saying Paris Targets Can Be Met "At A Canter"', *The Guardian* (online, 5 September 2018) <<https://www.theguardian.com/australia-news/2018/sep/05/scott-morrison-contradicts-energy-advice-saying-paris-targets-can-be-met-at-a-canter>>.

<sup>110</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2017* (Report, 18 May 2018) 5.

<sup>111</sup> Carbon Market Institute, *Response to Discussion Paper 2017 Review of Climate Change Policies* (Report, May 2017) 7.

### 3.2 Norway

There are five main political parties in Norway: the Labour Party, the Conservative Party, the Progress Party, the Christian Democratic Party, and the Centre Party. The Labour Party (Det Norske Arbeiderparti), a social democratic party, is the largest political party in Norway, established in 1887,<sup>112</sup> focusing on liberty, democracy and social justice.<sup>113</sup> The Conservative Party (Høyre) was founded in 1884 and is the party to which the current Prime Minister, Erna Solberg, belongs.<sup>114</sup> This party aims to promote:

economic growth and sound state finances, achieve a property-owning democracy, and to uphold democratic government, social security, private property, private initiative and personal liberty.<sup>115</sup>

The Progress Party (Fremskrittspartiet) was established in 1973 focusing on civil liberties and individualism.<sup>116</sup> The Christian Democratic Party (Kristelig Folkeparti) was founded in 1933 and is known as a 'family-friendly' party.<sup>117</sup> Lastly, the Centre Party (Senterpartiet) was established in 1920 advocating to maintain a decentralised economy and society.<sup>118</sup> The chart below shows a brief explanation of the five main parties and their Prime Ministers in power.<sup>119</sup>

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<sup>112</sup> Norsk Senter for Forskningsdata, *Norway – Political Parties* (Web Page) <[https://nsd.no/european\\_election\\_database/country/norway/parties.html](https://nsd.no/european_election_database/country/norway/parties.html)>.

<sup>113</sup> Arbeiderpartiet, *Information about the Norwegian Labour Party* (Web Page) <<https://www.arbeiderpartiet.no/om/information-in-english/>>.

<sup>114</sup> Norsk Senter for Forskningsdata, *Norway – Political Parties* (Web Page) <[https://nsd.no/european\\_election\\_database/country/norway/parties.html](https://nsd.no/european_election_database/country/norway/parties.html)>.

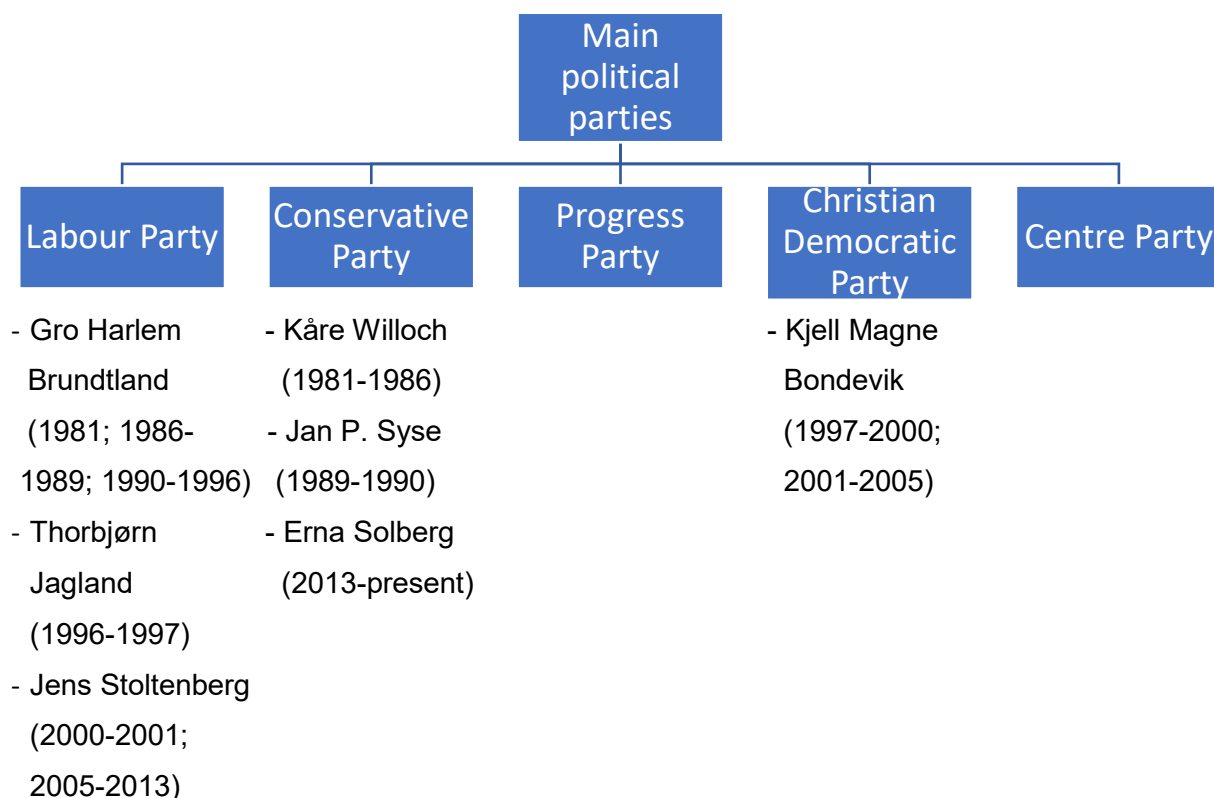
<sup>115</sup> Norsk Senter for Forskningsdata, *Norway – Political Parties* (Web Page) <[https://nsd.no/european\\_election\\_database/country/norway/parties.html](https://nsd.no/european_election_database/country/norway/parties.html)>.

<sup>116</sup> Norsk Senter for Forskningsdata, *Norway – Political Parties* (Web Page) <[https://nsd.no/european\\_election\\_database/country/norway/parties.html](https://nsd.no/european_election_database/country/norway/parties.html)>.

<sup>117</sup> Norsk Senter for Forskningsdata, *Norway – Political Parties* (Web Page) <[https://nsd.no/european\\_election\\_database/country/norway/parties.html](https://nsd.no/european_election_database/country/norway/parties.html)>.

<sup>118</sup> Norsk Senter for Forskningsdata, *Norway – Political Parties* (Web Page) <[https://nsd.no/european\\_election\\_database/country/norway/parties.html](https://nsd.no/european_election_database/country/norway/parties.html)>.

<sup>119</sup> Encyclopaedia Britannica, *List of Prime Ministers of Norway* (Web Page) <<https://www.britannica.com/topic/list-of-prime-ministers-of-Norway-2068238>>.



The development of climate policies has been ongoing in Norway since the early 1980s. Norway's *Pollution Control Act 1981 (PCA 1981)* is an example. The *PCA 1981* prohibits a person from polluting without a specific permit to pollute from the relevant authority.<sup>120</sup> The definition of 'pollution' is provided in *PCA 1981* s 6.<sup>121</sup> This Act is used to regulate GHGe in Norway. This point is discussed further in Chapter 3.

Years after the enactment of the *PCA 1981*, the focus on climate change increased when Gro Harlem Brundtland became the Prime Minister of Norway. This led to the creation of the following legislation and policies:

- (1) stabilisation target;
- (2) *CO<sub>2</sub> Tax Act 1991*;<sup>122</sup>
- (3) *Petroleum Activities Act 1996 (PAA 1996)*.<sup>123</sup>

<sup>120</sup> *Pollution Control Act 1981* (Norway) s 11 (as amended in 2003) ('*PCA 1981*').

<sup>121</sup> According to *PCA 1981* s 6, 'pollution' means: '(1) the introduction of solids, liquids or gases to air, water or ground, (2) noise and vibrations, (3) light and other radiation to the extent decided by the pollution control authority, (4) effects on temperature which cause or may cause damage or nuisance to the environment'.

<sup>122</sup> This Act is also known as Act 21 December 1990 no. 72 relating to tax on discharge of CO<sub>2</sub> in the petroleum activities on the continental shelf.

<sup>123</sup> *Petroleum Activities Act 1996* (Norway) (Act 29 November 1996 No. 72 relating to petroleum activities).

The stabilisation target was a target set by Norway to maintain CO<sub>2</sub> emissions at 1989 levels by 2000.<sup>124</sup> This was a preliminary target acting as a starting point on the issue of climate change. The main instrument for achieving the stabilisation target was the carbon tax. Norway's national commitments under the *KP* replaced the stabilisation target.<sup>125</sup> A carbon tax was introduced in 1991 and remains in operation.<sup>126</sup> This was in line with the 'polluter pays' principle.<sup>127</sup> A carbon tax 'is a levy charged for the use of fossil fuels and is based on the amount of carbon given off when a fossil fuel is burned'.<sup>128</sup>

The *PAA 1996*<sup>129</sup> contains provisions on 'pollution damage'<sup>130</sup> and safeguarding the environment. The *PCA 1981* and the *PAA 1996* have been broadly enacted without clearly defining what kind of pollution and type of greenhouse gases are covered within the scope of the Act. However, this legislation has placed Norway in a better position than other countries, as they began addressing GHGe many years ago.

During Kjell Magne Bondevik's Prime Ministership, the *Greenhouse Gas Emissions Trading Act 2004 (GGETA 2004)* established an ETS in Norway that operated from 2005-2007. This Act covers 'emissions from activities on the Norwegian part of the continental shelf'.<sup>131</sup> It applies to CO<sub>2</sub> emissions from the sectors stated in *GGETA 2004* s 3. This Act makes specific reference to CO<sub>2</sub> emissions.

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<sup>124</sup> Organisation for Economic Co-operation and Development, 'Norway' (Web Page) <<https://www.oecd.org/env/country-reviews/2450976.pdf>>.

<sup>125</sup> Norway's emissions target under the KP was to ensure that Norway's GHGe did not exceed its '1990-level by more than one per cent in the period 2008-2012.' Source: Norwegian Ministry of the Environment, Parliament of Norway, *Norway's Report on Demonstrable Progress Under the Kyoto Protocol Status Report as of December 2005* (Report, 2005) 6 <<https://unfccc.int/resource/docs/dpr/nor1.pdf>>. See Chapter 3 Section 2.4.1.

<sup>126</sup> Michal Nachmany et al, 'Climate Change Legislation in Norway an excerpt from The 2015 Global Climate Legislation Study A Review of Climate Change Legislation in 99 Countries', *London School of Economics and Political Science* (Web Page), 5 <<http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2015/05/NORWAY.pdf>>.

<sup>127</sup> Norwegian Ministry of Climate and Environment, Parliament of Norway, *Status report as of January 2018 Norway's Seventh National Communication Under the Framework Convention on Climate Change* (Report, January 2018) 67 <[http://unfccc.int/files/national\\_reports/annex\\_i\\_natcom/submitted\\_natcom/application/pdf/529371\\_norway-nc7-br3-1-nc7\\_-\\_br3\\_-\\_final.pdf](http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/529371_norway-nc7-br3-1-nc7_-_br3_-_final.pdf)>.

<sup>128</sup> Science Direct, *Carbon Tax* (Web Page) <<https://www.sciencedirect.com/topics/earth-and-planetary-sciences/carbon-tax>>.

<sup>129</sup> *Petroleum Activities Act 1996* (Norway) (Act 29 November 1996 No. 72 relating to petroleum activities).

<sup>130</sup> According to *Petroleum Activities Act 1996* s 7-1, pollution damage is defined as 'damage or loss caused by pollution as a consequence of effluence or discharge of petroleum from a facility including a well, and costs of reasonable measures to avert or limit such damage or such loss, as well as damage or loss as a consequence of such measures.'

<sup>131</sup> *Greenhouse Gas Emissions Trading Act 2004* (Norway) s 2.

In 2008, under Jens Stoltenberg Prime Ministership, the Norwegian ETS was linked to the European Union Emissions Trading Scheme (EU ETS). The main Directives covering the EU ETS is *Directive 2003/87/EC*,<sup>132</sup> *Directive 2009/29/EC*,<sup>133</sup> and *Directive 2018/410*.<sup>134</sup> Emissions are defined as ‘the release of greenhouse gases into the atmosphere from sources in an installation’.<sup>135</sup> The EU ETS covers emissions mainly from power generation installations, energy intensive industries, aviation, production and processing of ferrous metals, production of chemicals and aluminium, and several other sectors not mentioned.<sup>136</sup>

The EU ETS works on the ‘cap and trade’ principle whereby a cap is set determining the number of emissions allowances in the system. These emission allowances can be traded among emitters as long as their emissions are within the cap. Emissions in Norway are governed by the carbon tax policy and the EU ETS.<sup>137</sup> However, for the certain sectors and activities that are not covered under the EU ETS, the carbon tax policy is the main instrument.<sup>138</sup> These policies in Norway seem to have worked well in the fossil fuel industry, applying to slightly over 70% of Norway’s GHGe.<sup>139</sup> The EU ETS was the main instrument for reaching the *KP* targets.

Norway enacted new measures under the *Climate Change Act 2017 (CCA 2017)*. This Act applies to GHGe covered by Norway’s first NDC submitted under the *PA*.<sup>140</sup> This legislation provides for a system to review Norway’s climate targets every five years and an

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<sup>132</sup> *Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC* [2003] OJ L 275/32 (*‘Directive 2003/87/EC’*).

<sup>133</sup> *Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community* [2009] OJ L 140/63 (*‘Directive 2009/29/EC’*).

<sup>134</sup> *Directive (EU) 2018/410 of the European Parliament and of the Council of 14 March 2018 amending Directive 2003/87/EC to enhance cost-effective emission reduction and low-carbon investments, and Decision (EU) 2015/1814* [2018] OJ L 76/3 (*‘Directive 2018/410’*).

<sup>135</sup> *Directive 2003/87/EC* art 3(b).

<sup>136</sup> Annex I of the EU *Directive 2003/87/EC*; European Commission, *EU Emissions Trading System (EU ETS)* (Web Page) <[https://ec.europa.eu/clima/policies/ets\\_en](https://ec.europa.eu/clima/policies/ets_en)>.

<sup>137</sup> Michal Nachmany et al, ‘Climate Change Legislation in Norway an excerpt from The 2015 Global Climate Legislation Study A Review of Climate Change Legislation in 99 Countries’, *London School of Economics and Political Science* (Web Page), 5 <<http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2015/05/NORWAY.pdf>>.

<sup>138</sup> Norwegian Ministry of The Environment, Parliament of Norway, *Norwegian climate policy* (Report No. 34, 2006-2007) 21 <[https://www.regjeringen.no/contentassets/c215be6cd2314c7b9b64755d629ae5ff/en-gb/pdfs/stm200620070034000en\\_pdfs.pdf](https://www.regjeringen.no/contentassets/c215be6cd2314c7b9b64755d629ae5ff/en-gb/pdfs/stm200620070034000en_pdfs.pdf)>.

<sup>139</sup> Norwegian Ministry of The Environment, Parliament of Norway, *Norwegian climate policy* (Report No. 34, 2006-2007) 21-22 <[https://www.regjeringen.no/contentassets/c215be6cd2314c7b9b64755d629ae5ff/en-gb/pdfs/stm200620070034000en\\_pdfs.pdf](https://www.regjeringen.no/contentassets/c215be6cd2314c7b9b64755d629ae5ff/en-gb/pdfs/stm200620070034000en_pdfs.pdf)>.

<sup>140</sup> *Climate Change Act 2017* (Norway) s 2.

annual reporting mechanism.<sup>141</sup> Measures such as green taxes, preference for electric vehicles, and promotion of carbon capture and storage (CCS) have been taken as a response to the targets set in the *CCA 2017*.<sup>142</sup>

The carbon tax and regulations under the *PCA 1981* have fostered some measures to reduce emissions, such as CCS and RE.<sup>143</sup> The cap and trade system has also been a significant measure in reducing GHGe in Norway and the *CCA 2017* encourages further emissions reductions efforts. These measures are helping Norway to aim towards achieving the *PA* targets. This will be discussed in detail in Chapter 3.

The countries' commitments under the international legal framework have encouraged the countries to develop climate change mitigation legislation and policies over the years. The next chapter will discuss the GHGe situation in Australia and what approach it has taken towards the reduction of GHGe.

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<sup>141</sup> *Climate Change Act 2017* (Norway) s 5 and 6.

<sup>142</sup> Norwegian Ministry of Climate and Environment, Parliament of Norway, *Status report as of January 2018 Norway's Seventh National Communication Under the Framework Convention on Climate Change* (Report, January 2018) 10-11.

<sup>143</sup> Norwegian Ministry of Climate and Environment, Parliament of Norway, *Status report as of January 2018 Norway's Seventh National Communication Under the Framework Convention on Climate Change* (Report, January 2018) 12-13.



## *Chapter 2: Australian Law and Policies on Greenhouse Gas Emissions*

### **Introduction**

As greenhouse gas emissions (GHGe) rise annually, Australia has portrayed itself as taking serious action to reduce emissions. There has been political contestation regarding Federal Government policies and a 'paradox of climate politics' in Australia since the late 1990s.<sup>1</sup> Australia has made many legislative and policy changes to address the issue of climate change. Policy reversal has occurred over different political cycles due to a lack of bipartisan support for climate policies in Australia, inadequate current emissions reduction targets, and annually rising emissions. The main aim of this thesis is to propose: (a) what Australia can learn from the Norwegian legislation and policies; and (b) policies to reduce GHGe and achieve the *Paris Agreement (PA)* targets. This requires consideration of Australia's previous and current climate change mitigation legislation and policies and their contribution to GHGe reduction.

This chapter begins by providing a brief history of fossil fuel development in Australia and GHGe, and a brief overview of the sequence of policies and legislative choices, noting the political parties and their leaders who supported the various policies over those different periods of time. It then assesses whether Australia's legislation and policies to date have reduced GHGe in the fossil fuel industry and economy wide.

### **1.0 Brief Background - Australia**

#### *1.1 Fossil Fuel Development in Australia*

In the mid-1960s, petroleum was discovered in the Bass Strait offshore area. Subsequently, the Halibut and Kingfisher oil fields were discovered near this Strait, and the most dominant petroleum producing field became the Bass Strait.<sup>2</sup> In the 1980s, gas fields such as Gorgon and Pluto were discovered on the North West Shelf.<sup>3</sup> Over the years, Australia has become a large producer of gas, which is used domestically and exported to countries such as China, Japan and Korea.

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<sup>1</sup> M. Beeson and M. McDonald, 'The Politics of Climate Change in Australia' (2013) 59(3) *Australian Journal of Politics and History* 331, 332.

<sup>2</sup> J. Chandler and T. Hunter, *Petroleum Law in Australia* (Chatswood, N.S.W, LexisNexis Butterworths, 1<sup>st</sup> ed, 2013) 39.

<sup>3</sup> J. Chandler and T. Hunter, *Petroleum Law in Australia* (Chatswood, N.S.W, LexisNexis Butterworths, 1<sup>st</sup> ed, 2013) 39.

Australia also has significant involvement in the coal mining industry. Most of Australia's generated electricity is supplied by coal-fired power stations. Besides domestic consumption, Australia is one of the world's largest exporters of coal, mainly to Asian countries.<sup>4</sup>

In Australia, the federal system of government means that the control of petroleum resources is divided between the Crown in the right of the States and the Crown in the right of the Commonwealth. Broadly, the States own the onshore petroleum resources and the Commonwealth owns the offshore petroleum resources beyond the 'coastal waters' (the first three nautical miles beyond the baseline of the low water mark at the edge of the land territory).<sup>5</sup>

The traditional concession system of the North American model was initially used as a model for companies and governments for the exploitation of petroleum.<sup>6</sup> When Australia was discovering its petroleum resources in the early 1960s, it lacked the competence and skill to develop the resources and turned to the North American regulatory system to develop its regulatory framework.<sup>7</sup>

Subsequently, the *Commonwealth Petroleum (Submerged Lands) Act 1967* (Cth) came into effect and was renamed as the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) (*OPGGSA 2006*) incorporating greenhouse gas storage provisions, as discussed in the Introduction to this thesis.

## 1.2. Australia's Greenhouse Gas Emissions

As mentioned in the introductory chapter, most GHGe arise from the fossil fuel industry. Australia faces significant challenges in reducing GHGe, as the fossil fuel industry is expanding. It is the largest gas exporter in the world, overtaking Qatar, exporting gas as

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<sup>4</sup> Department of Industry, Innovation and Science, Parliament of Australia, *Resources and Energy Quarterly March 2019* (Report, March 2019) 39, 48  
<<https://publications.industry.gov.au/publications/resourcesandenergyquarterlymarch2019/documents/Resources-and-Energy-Quarterly-March-2019.pdf>>

<sup>5</sup> Tina Hunter, 'Comparative Law as an Instrument in Transnational law: the example of petroleum regulation' (2009) 21(3) *Bond Law Review* 42, 48; Australian Government Geoscience Australia, *Maritime Boundary Definitions* (Web Page) <<https://www.ga.gov.au/scientific-topics/marine/jurisdiction/maritime-boundary-definitions#heading-3>>.

<sup>6</sup> Oystein Noreng, *The Oil Industry and Government Strategy in the North Sea* (Routledge, 1980) 14.

<sup>7</sup> Oystein Noreng, *The Oil Industry and Government Strategy in the North Sea* (Routledge, 1980) 17.

liquefied natural gas (LNG) mainly to Asia.<sup>8</sup> Rapid growth in the production and exportation of gas is increasing GHGe in Australia. The use of ships/tankers to transport LNG makes it more difficult to reduce emissions from the transportation sector.

LNG production is projected to grow nearly 200% between 2015 and 2020, causing a likely 85% increase in emissions from the energy sector in these years, mostly from Western Australia.<sup>9</sup> This is evident with rising LNG exports, increasing by 11.4% in 2019 compared to the previous year's exports.<sup>10</sup> The production of unconventional gas would not help the industry to move towards zero emissions.<sup>11</sup>

There are eight sectors which contribute to the total emissions in Australia: electricity, transportation, stationary energy, agriculture, fugitive emissions, industrial, waste, and land use sectors.<sup>12</sup> The largest polluter is the electricity sector, accountable for 33% of Australia's GHGe.<sup>13</sup>

Australia's emissions are rising and hit the highest on record in 2019.<sup>14</sup> This information is current as at 9 July 2019. The figures below show Australia's GHGe from all sectors. Based on Figures 3 and 4, Australian emissions have been rising annually from 2014 onwards. Significant legislation and policies to address this issue is discussed in sections 2.0 and 3.0 below.

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<sup>8</sup> Climate Council, *What the frack? Australia overtakes Qatar as world's largest gas exporter* (Web Page) <<https://www.climatecouncil.org.au/australia-worlds-largest-gas-exporter/>>.

<sup>9</sup> Bill Hare et al, *Western Australia's Gas Gamble Implications of Exploiting Canning Basin and other Unconventional Gas Resources for Achieving Climate Targets* (Report, March 2018) 23 <<https://climateanalytics.org/media/climateanalytics-report-westernaustraliasgasmble-2018.pdf>>.

<sup>10</sup> Nick Toscano, 'Australia Tops Qatar As World's Biggest LNG Exporter', *The Sydney Morning Herald* (online, 6 January 2020) <<https://www.smh.com.au/business/the-economy/australia-tops-qatar-as-world-s-biggest-lng-exporter-20200106-p53p5h.html>>.

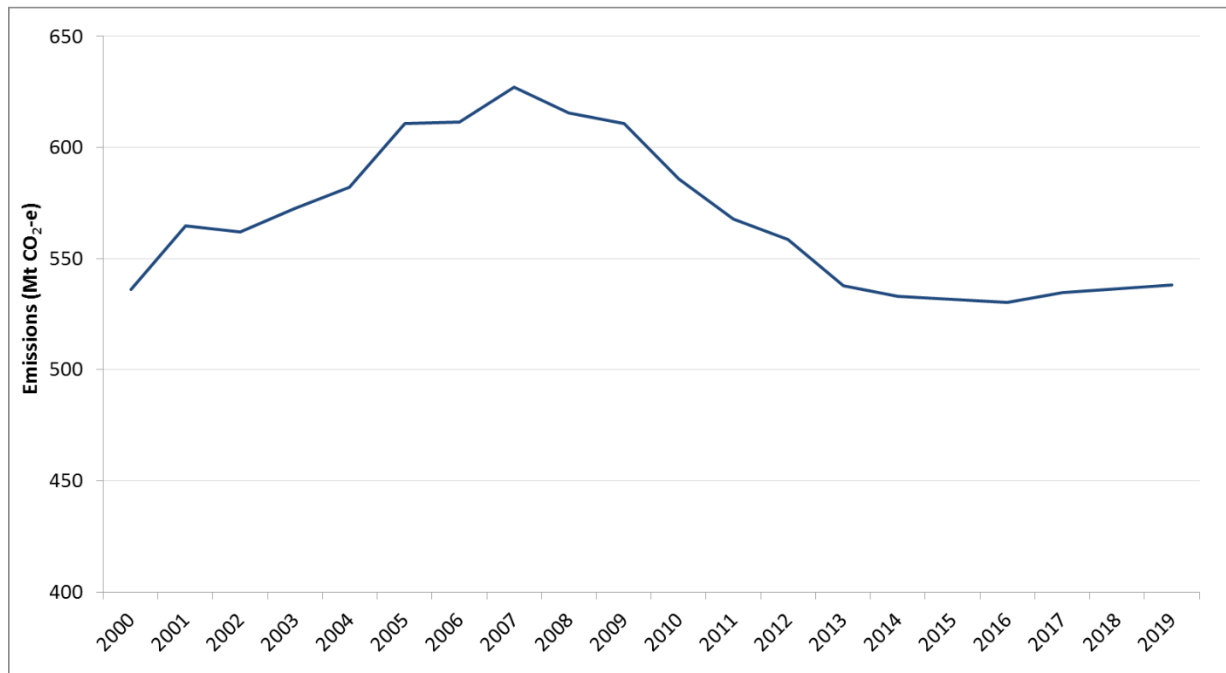
<sup>11</sup> B. Hare et al, *Western Australia's Gas Gamble Implications of Exploiting Canning Basin and other Unconventional Gas Resources for Achieving Climate Targets* (Report, March 2018) 51 <<https://climateanalytics.org/media/climateanalytics-report-westernaustraliasgasmble-2018.pdf>>.

<sup>12</sup> G. Bourne et al, *Australia's Rising Greenhouse Gas Emissions* (Report, 2018) II <[https://www.climatecouncil.org.au/wp-content/uploads/2018/06/CC\\_MVSA0143-Briefing-Paper-Australias-Rising-Emissions\\_V8-FA\\_Low-Res\\_Single-Pages3.pdf](https://www.climatecouncil.org.au/wp-content/uploads/2018/06/CC_MVSA0143-Briefing-Paper-Australias-Rising-Emissions_V8-FA_Low-Res_Single-Pages3.pdf)>.

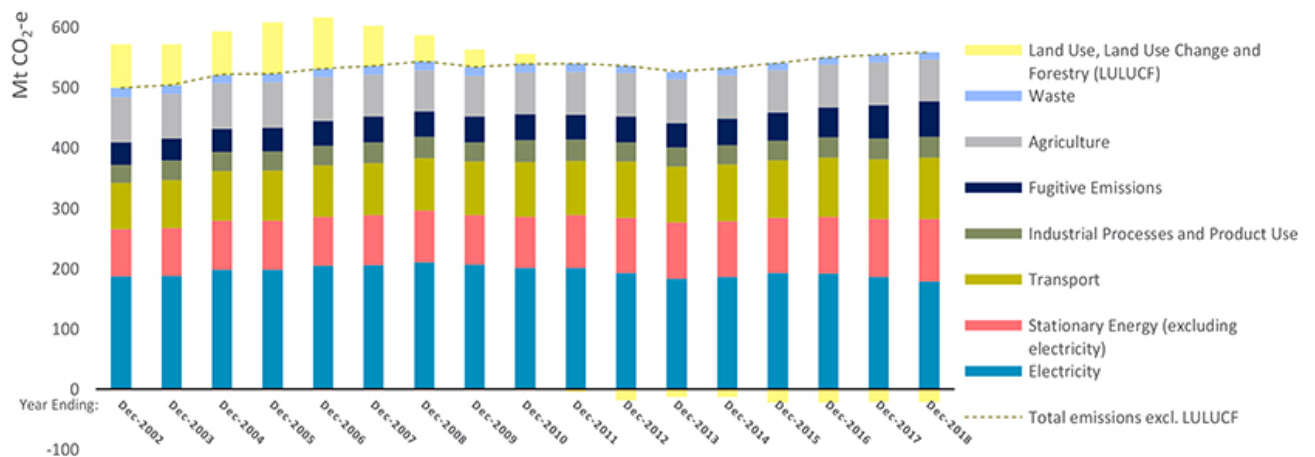
<sup>13</sup> G. Bourne, A. Stock, W. Steffen, P. Stock, L. Brailsford, *Australia's Rising Greenhouse Gas Emissions* (Climate Council of Australia, 2018) II.

<sup>14</sup> Lisa Cox, 'Australia's Emissions Reach The Highest On Record, Driven By Electricity Sector', *The Guardian* (online, 9 July 2019) <<https://www.theguardian.com/australia-news/2019/jul/09/australias-emissions-reach-the-highest-on-record-driven-by-electricity-sector>>.

**Figure 3: Greenhouse gas emissions National inventory total from June 2000-2019<sup>15</sup>**



**Figure 4: Australia's emissions from 2002-2018<sup>16</sup>**



<sup>15</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2018* (Report, 2019) 57  
<https://www.environment.gov.au/system/files/resources/408fcc37-dcfd-4ab8-a4f9-facc6bd98ea6/files/nggi-quarterly-update-dec-2018.pdf>.

<sup>16</sup> Ndevr Environmental, *Tracking 2 Degrees – FY19 Q2* (Web Page)  
<http://ndevr.com.au/environmental/tracking-2-degrees-fy19-q2>.

## 2.0 Significant Legislation and Policies Introduced in Australia During Different Governments

### 2.1 Mandatory Renewable Energy Target

The Howard Government came into power in March 1996.<sup>17</sup> At the time there was significant pressure to address the issue of climate change. Howard's 10 years of leadership largely ignored legal action on climate change. The Howard Government strongly opposed legislation that would directly limit GHGe. It took a voluntary 'no regrets' path; the National Greenhouse Strategy (NGS) 1998 was an example of that approach.<sup>18</sup> The goals of the NGS focused on limiting net GHGe, fostering knowledge and understanding of GHGe issues, and laying the 'foundations for adaptation to climate change'.<sup>19</sup> This program was set up to find ways to reduce GHGe without significant expenditure<sup>20</sup> or legally binding obligations.<sup>21</sup>

The *Kyoto Protocol (KP)* was adopted in December 1997.<sup>22</sup> The Howard Government signed the *KP* in April 1998 but refused to ratify it,<sup>23</sup> opposing and viewing the *KP* as 'next to useless'.<sup>24</sup> The Government was concerned about the economic consequences of accepting the Protocol's legally binding target.<sup>25</sup> This was mainly because the Australian economy depended highly on fossil fuels and ratifying the *KP* would impact the economy,<sup>26</sup> including jobs and industry. The Howard Government was heavily criticised by the Greens for refusing to ratify the *KP*.<sup>27</sup>

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<sup>17</sup> National Archives of Australia, *Australia's Prime Ministers Timeline* (Web Page) <<http://primeministers.naa.gov.au/timeline/results.aspx?type=pm&pm=John%20Howard>>.

<sup>18</sup> Commonwealth of Australia, *The National Greenhouse Strategy* (Report, 1998) ix <[http://www2.eie.ucr.ac.cr/~jromero/sitio-TCU-oficial/normativa/archivos/leyes\\_int/green\\_house.pdf](http://www2.eie.ucr.ac.cr/~jromero/sitio-TCU-oficial/normativa/archivos/leyes_int/green_house.pdf)>.

<sup>19</sup> Commonwealth of Australia, *The National Greenhouse Strategy* (Commonwealth of Australia, 1998) viii.

<sup>20</sup> Commonwealth of Australia, *The National Greenhouse Strategy* (Commonwealth of Australia, 1998) 1.

<sup>21</sup> Laura Horn, 'The Kyoto Protocol: Australia's Commitment and Compliance' (2001) 24(2) *UNSW Law Journal* 583, 584.

<sup>22</sup> United Nations Climate Change, *The Kyoto Protocol – Status of Ratification* (Web Page) <<https://unfccc.int/process/the-kyoto-protocol/status-of-ratification>>.

<sup>23</sup> Parliament of Australia, *The Kyoto Protocol* (Web Page) <[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/Browse\\_by\\_Topic/ClimateChangeold/governance/international/theKyoto](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Browse_by_Topic/ClimateChangeold/governance/international/theKyoto)>; Evgeny Guglyuvatty and Natalie P. Stoianoff, 'Carbon Policy in Australia – A Political History' (2016) *Green Fiscal Reform for a Sustainable Future* 31, 32.

<sup>24</sup> 'Kyoto Protocol 'Next To Useless': PM', *The Sydney Morning Herald* (online, 17 February 2005) <<https://www.smh.com.au/environment/kyoto-protocol-next-to-useless-pm-20050217-gdkpos.html>>.

<sup>25</sup> Ingrid Barnsley, 'Dealing with Change: Australia, Canada and the Kyoto Protocol to the Framework Convention on Climate Change' (2006) 95(385) *The Round Table* 399, 406.

<sup>26</sup> Tek Narayan Maraseni, Jerry Maroulis and Geoff Cockfield, 'An Analysis of Australia's Carbon Pollution Reduction Scheme' (2009) 66(5) *International Journal of Environmental Studies* 591, 591.

<sup>27</sup> ABC News, *Greens Criticise Govt over Kyoto Refusal* (Web Page) <<https://www.abc.net.au/news/2007-10-28/greens-criticise-govt-over-kyoto-refusal/2593114>>.

One of the significant measures introduced by the Howard Government was the Mandatory Renewable Energy Target (MRET), currently known as the Renewable Energy Target (RET), focusing on renewable energy (RE). This measure was enacted under the *Renewable Energy (Electricity) Act 2000* (Cth) (as amended and entered into force on 10 March 2016). The MRET has existed since 2001, aiming to generate 2% of the nation's electricity by RE, which was increased to 20% in 2009 under the Rudd Labor Government.<sup>28</sup> The RET will be discussed further in Chapter 5.

The Howard Government refused to believe that climate change was a real threat until the Millennium Drought, which occurred from late 1996 until mid-2010, became severe.<sup>29</sup> This caused the Howard Government to act on climate change. In 2007, during the drought, real concerns over climate change began to develop. As a result, Howard appointed a panel to investigate the legislative options and took a cap and trade emissions trading policy to the 2007 election. Due to political pressure, in December 2006, the Prime Ministerial Task Group on Emissions Trading was established<sup>30</sup> to advise on an Australian scheme for regulating GHGe, then moving towards a domestic emissions trading scheme (ETS). This task group was criticised as being biased against the fossil fuel industry.<sup>31</sup>

## 2.2 National Greenhouse and Energy Reporting Scheme

This section introduces the National Greenhouse and Energy Reporting (NGER) scheme which is explained further in section 3.1. The most significant measure taken by the Howard Government was the introduction of the NGER scheme<sup>32</sup> in 2007, which was

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<sup>28</sup> *Renewable Energy (Electricity) Amendment Bill 2009* s 8. The current legislation is the *Renewable Energy (Electricity) Act 2000* (Cth) with the latest amendments up to 2018. Australian Government Clean Energy Regulator, *History of the Scheme* (Web Page) <<http://www.cleanenergyregulator.gov.au/RET/About-the-Renewable-Energy-Target/History-of-the-scheme>>; Parliament of Australia, *Renewable Energy Target* (Web Page) <[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/Browse\\_by\\_Topic/ClimateChangeold/governance/domestic/national/mandatory](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Browse_by_Topic/ClimateChangeold/governance/domestic/national/mandatory)>.

<sup>29</sup> Australian Government Bureau of Meteorology, *Recent Rainfall, Drought and Southern Australia's Long-term Rainfall Decline* (Web Page) <<http://www.bom.gov.au/climate/updates/articles/a010-southern-rainfall-decline.shtml>>.

<sup>30</sup> Australian Government Productivity Commission, Parliament of Australia, *Productivity Commission Submission to the Prime Ministerial Task Group on Emissions Trading* (Report, March 2007) 1 <<https://www.pc.gov.au/research/supporting/emissions-trading/emissionstrading.pdf>>.

<sup>31</sup> Christoff P., 'All Smokes and Mirrors? Carbon Trading in Australia' (2007) 89 *Arena Magazine* 13, 13.

<sup>32</sup> Australian Government Department of Agriculture, Water and the Environment, *National Greenhouse and Energy Reporting* (Web Page) <<https://www.environment.gov.au/climate-change/climate-science-data/greenhouse-gas-measurement/nger>>; Nicola Durrant, 'The Australian Response to Climate Change: business as usual or legal innovation?' (2010) 22(3) *Environmental Law and Management Journal* 105, 110.

established by the *National Greenhouse and Energy Reporting Act 2007 (Cth) (NGER Act 2007)*. This Act remains in force and requires companies to report on their level of greenhouse gases emitted.<sup>33</sup> For large emitting companies emitting more than 25 kilotonnes of CO<sub>2</sub>-e,<sup>34</sup> they are required to be registered under *NGER Act 2007* s 19(1) which mandates annual reporting. Failure to do so may give rise to sanctions being imposed and liability to pay a civil penalty.<sup>35</sup> The introduction of the *NGER Act 2007* was a 'first step towards emissions trading' because it established a scheme for measuring GHGe.<sup>36</sup> It remains in place notwithstanding changes of national Government.

### 2.3 Carbon Pollution Reduction Scheme

The Rudd Government was elected in December 2007<sup>37</sup> and immediately ratified the *KP* which came into force in the same year.<sup>38</sup> Its policy was to reduce emissions by placing a price on carbon. As a result, in 2008, the new Government proposed a national trading scheme, the Carbon Pollution Reduction Scheme (CPRS).<sup>39</sup>

This CPRS was to operate as a cap and trade scheme, placing 'a limit, or cap, on the amount of carbon pollution industry can emit'.<sup>40</sup> The objectives of the scheme were to help Australia reach its target in reducing GHGe, provide support by effectively responding to climate change, and assist households and firms that are affected.<sup>41</sup> This scheme placed an obligation on the 1,000 largest emitters, who each emit more than 25,000 tonnes of carbon

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<sup>33</sup> *National Greenhouse and Energy Reporting Act 2007 (Cth)* s 19(2).

<sup>34</sup> *National Greenhouse and Energy Reporting Act 2007 (Cth)* s 13(1)(d)(i).

<sup>35</sup> *National Greenhouse and Energy Reporting Act (2007) Cth* s 29 and 30; Zahar, Peel and Godden, *Australian Climate Law in Global Context* (Cambridge University Press, 2013) 188.

<sup>36</sup> Evgeny Guglyuvatyy and Natalie P. Stoianoff, 'Carbon Policy in Australia – A Political History' (2016) *Green Fiscal Reform for a Sustainable Future* 31, 35.

<sup>37</sup> Australian Prime Minister, *Kevin Rudd* (Web Page) <<https://primeministers.moadoph.gov.au/prime-ministers/kevin-rudd>>; Nicola Durrant, 'The Australian Response to Climate Change: Business as Usual or Legal Innovation?' (2010) 22(3) *Environmental Law and Management Journal* 105, 110.

<sup>38</sup> Parliament of Australia, *The Kyoto Protocol* (Web Page) <[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/Browse\\_by\\_Topic/ClimateChangeold/governance/international/theKyoto](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Browse_by_Topic/ClimateChangeold/governance/international/theKyoto)>.

<sup>39</sup> Nicola Durrant, 'The Australian Response to Climate Change: Business as Usual or Legal Innovation?' (2010) 22(3) *Environmental Law and Management Journal* 105, 111; Evgeny Guglyuvatyy and Natalie P. Stoianoff, 'Carbon Policy in Australia – A Political History' (2016) *Green Fiscal Reform for a Sustainable Future* 31, 35.

<sup>40</sup> Department of Climate Change, Parliament of Australia, *Carbon Pollution Reduction Scheme Green Paper* (Summary Report, July 2008) IV <[https://www.businessnz.org.nz/\\_data/assets/pdf\\_file/0003/74721/Carbon-Pollution-Reduction-Scheme.pdf](https://www.businessnz.org.nz/_data/assets/pdf_file/0003/74721/Carbon-Pollution-Reduction-Scheme.pdf)>.

<sup>41</sup> Department of Climate Change, Parliament of Australia, *Carbon Pollution Reduction Scheme Green Paper* (Summary Report, July 2008) 14 <[https://www.businessnz.org.nz/\\_data/assets/pdf\\_file/0003/74721/Carbon-Pollution-Reduction-Scheme.pdf](https://www.businessnz.org.nz/_data/assets/pdf_file/0003/74721/Carbon-Pollution-Reduction-Scheme.pdf)>.

dioxide a year, to buy a pollution permit for each tonne of carbon dioxide emitted into the atmosphere.<sup>42</sup> The stationary energy, transport, fugitive emissions, industrial processes, waste and forestry sectors were covered by the scheme.<sup>43</sup> The proposed scheme relied on the NGER scheme under the *NGER Act 2007* to ensure effective reporting and compliance. The Government was of the view that the CPRS was flexible and incurred less cost on the basis that it was a 'market-based' approach.<sup>44</sup>

However, the CPRS also had several significant drawbacks: (i) proposed legislation did not set a limit on the greenhouse gases emitted; (ii) loopholes in the design of the CPRS; (iii) ability of entities to import unlimited numbers of international units; (iv) issuance of free permits; (v) weak targets; and (vi) compensation for big polluters.<sup>45</sup> This scheme was criticised heavily by affected businesses and the federal opposition.

The scheme was also criticised for awarding large amounts of free permits, usage of price caps, high costs on businesses, unclear level of carbon pricing to reduce coal-fired power, a lack of commitment shown to maintain the MRET, and scheme failure to address the issue of climate change resulting from coal burning.<sup>46</sup> These criticisms came from varying sources with different interests and motivations.

The Greens Party refused to support the CPRS in the Senate; its view was that the CPRS paid polluters to keep on polluting, undermined global action with a weak target, and

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<sup>42</sup> Department of Climate Change, Parliament of Australia, *Carbon Pollution Reduction Scheme Green Paper* (Summary Report, July 2008) IV  
<[https://www.businessnz.org.nz/\\_\\_data/assets/pdf\\_file/0003/74721/Carbon-Pollution-Reduction-Scheme.pdf](https://www.businessnz.org.nz/__data/assets/pdf_file/0003/74721/Carbon-Pollution-Reduction-Scheme.pdf)>.

<sup>43</sup> Department of Climate Change, Parliament of Australia, *Carbon Pollution Reduction Scheme Green Paper* (Summary Report, July 2008) 15-18  
<[https://www.businessnz.org.nz/\\_\\_data/assets/pdf\\_file/0003/74721/Carbon-Pollution-Reduction-Scheme.pdf](https://www.businessnz.org.nz/__data/assets/pdf_file/0003/74721/Carbon-Pollution-Reduction-Scheme.pdf)>.

<sup>44</sup> Department of Climate Change, Parliament of Australia, *Carbon Pollution Reduction Scheme Green Paper* (Summary Report, July 2008) 9  
<[https://www.businessnz.org.nz/\\_\\_data/assets/pdf\\_file/0003/74721/Carbon-Pollution-Reduction-Scheme.pdf](https://www.businessnz.org.nz/__data/assets/pdf_file/0003/74721/Carbon-Pollution-Reduction-Scheme.pdf)>.

<sup>45</sup> Nicola Durrant, 'The Australian Response to Climate Change: business as usual or legal innovation?' (2010) 22(3) *Environmental Law and Management Journal* 105, 112; Environment Victoria, 'Off Targets: The Fundamental Flaws in the Rudd Government's Carbon Pollution Reduction Scheme' (Web Page)  
<[https://www.aph.gov.au/~media/wopapub/senate/committee/climate\\_ctte/submissions/sub409a\\_pdf.ashx](https://www.aph.gov.au/~media/wopapub/senate/committee/climate_ctte/submissions/sub409a_pdf.ashx)>.

<sup>46</sup> Nicola Durrant, 'The Australian Response to Climate Change: business as usual or legal innovation?' (2010) 22(3) *Environmental Law and Management Journal* 105, 111; *Australia Energy Policy, Laws and Regulations Handbook Vol. 2* (International Business Publications, 2011) 41.



made an over-allocation of free permits.<sup>47</sup> The Labor Government could only get its legislation through the Senate with the support of the Liberal Party, then led by Malcolm Turnbull. The rejection of the CPRS subsequently led to the downfall of the Labor Government. This subsequently led to a change in Liberal leadership, whereby Tony Abbott replaced Turnbull as the opposition leader in November 2009. Julia Gillard became the Labor leader and the Prime Minister of Australia in June 2010.<sup>48</sup> The Gillard Government took bold positions on climate policy as set out below.

## 2.4 Carbon Pricing Mechanism

### 2.4.1 The Introduction of Carbon Pricing Mechanism

Gillard promised during the 2010 election campaign that there would be no ‘carbon tax’ under a government she would lead.<sup>49</sup> However, she could only form the Government with the help of the Greens<sup>50</sup> and independent members of Parliament,<sup>51</sup> who insisted on establishing a carbon pricing scheme as a condition of supporting her Government.

In 2011, the Australian Government released the Clean Energy Future Plan.<sup>52</sup> This plan included ‘introducing a carbon price; promoting innovation and investment in renewable energy; encouraging energy efficiency; and creating opportunities in the land sector to cut pollution’.<sup>53</sup> The Australian Government described this scheme as a ‘carrot and stick’ approach.<sup>54</sup>

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<sup>47</sup> Bob Brown, ‘The Greens and Emissions Trading – Your Questions Answered’, *GreenMPs* (Web Page, 14 January 2010) <<https://greensmps.org.au/articles/greens-and-emissions-trading---your-questions-answered>>.

<sup>48</sup> Evgeny Guglyuvatyy and Natalie P. Stoianoff, ‘Carbon Policy in Australia – A Political History’ (2016) *Green Fiscal Reform for a Sustainable Future* 31, 39.

<sup>49</sup> Evgeny Guglyuvatyy and Natalie P. Stoianoff, ‘Carbon Policy in Australia – A Political History’ (2016) *Green Fiscal Reform for a Sustainable Future* 31, 39.

<sup>50</sup> The Greens supported the comprehensive CPM as the Gillard Government had an ‘evidence-based plan’. Source: The Greens, *The Greens and the CPRS* (Web Page) <<https://greens.org.au/cprs>>.

<sup>51</sup> Evgeny Guglyuvatyy and Natalie P. Stoianoff, ‘Carbon Policy in Australia – A Political History’ (2016) *Green Fiscal Reform for a Sustainable Future* 31, 39.

<sup>52</sup> Greg Combet, *Securing a Clean Energy Future: Implementing the Australian Government’s Climate Change Plan* (CanPrint Communications Pty Ltd, 2012) <[https://archive.budget.gov.au/2012-13/ministerial\\_statements/ms\\_climate\\_change.pdf](https://archive.budget.gov.au/2012-13/ministerial_statements/ms_climate_change.pdf)>.

<sup>53</sup> Greg Combet, *Securing a Clean Energy Future: Implementing the Australian Government’s Climate Change Plan* (CanPrint Communications Pty Ltd, 2012) 5 <[https://archive.budget.gov.au/2012-13/ministerial\\_statements/ms\\_climate\\_change.pdf](https://archive.budget.gov.au/2012-13/ministerial_statements/ms_climate_change.pdf)>.

<sup>54</sup> Environment and Communications References Committee, Parliament of Australia, *Direct Action: Paying Polluters to Halt Global Warming?* (Report, March 2014) 52 <[https://www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Environment\\_and\\_Communications/Direct\\_Action\\_Plan/Report/index](https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/Direct_Action_Plan/Report/index)>.

In pursuit of that plan, Gillard established the Multi-Party Climate Change Committee to design a carbon pricing mechanism (CPM).<sup>55</sup> The Committee's draft legislation was passed by the House of Representatives and the Senate on 18 November 2011.<sup>56</sup> The *Clean Energy Act 2011* (Cth) (*CEA 2011*) together with 18 related Acts (Clean Energy package of legislation)<sup>57</sup> was passed on the 1 July 2012.

The main statute governing the CPM was the *CEA 2011*. The purpose of this Act was to give effect to the *United Nations Framework Convention on Climate Change 1992* (*UNFCCC*) and the *KP*.<sup>58</sup> The Act also:

support(ed) the development of an effective global response to climate change, consistent with Australia's national interest in ensuring that average global temperatures increase by not more than 2 degrees Celsius above pre-industrial levels.<sup>59</sup>

The *CEA 2011* adopted the Pigouvian rationale, which 'dictates the proper and equitable allocation of costs between entities engaging in pollution and victims of the pollution in society at large'.<sup>60</sup>

The *CEA 2011* introduced a price on GHGe with the aim of encouraging investment in clean energy, and supporting the job market and the economic growth of the country.<sup>61</sup> To achieve these objectives, the Act introduced a mechanism that took a 'hybrid form',<sup>62</sup> a fixed

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<sup>55</sup> Evgeny Guglyuvatyy and Natalie P. Stoianoff, 'Carbon Policy in Australia – A Political History' (2016) *Green Fiscal Reform for a Sustainable Future* 31, 39; Australian Government, 'Multi-Party Climate Change Committee: Clean Energy Agreement' (Web Page) <[https://www.pfpi.net/wp-content/uploads/2011/07/mpccc\\_cleanenergy\\_agreement-pdf.pdf](https://www.pfpi.net/wp-content/uploads/2011/07/mpccc_cleanenergy_agreement-pdf.pdf)>.

<sup>56</sup> *Clean Energy Act 2011* (Cth) s 2 (repealed).

<sup>57</sup> The Clean Energy package of legislation included the *Clean Energy (Charges-Customs) Act 2011* (Cth); *Clean Energy (Charges-Excise) Act 2011* (Cth); *Clean Energy (Consequential Amendments) Act 2011* (Cth); *Clean Energy (Customs Tariff Amendment) Act 2011* (Cth); *Clean Energy (Excise Tariff Legislation Amendment) Act 2011* (Cth); *Clean Energy (Fuel Tax Legislation Amendment) Act 2011* (Cth); *Clean Energy (Household Assistance Amendments) Act 2011* (Cth); *Clean Energy (Income Tax Rates Amendments) Act 2011* (Cth); *Clean Energy (International Unit Surrender Charge) Act 2011* (Cth); *Clean Energy Regulator Act 2011* (Cth); *Clean Energy (Tax Law Amendments) Act 2011* (Cth); *Clean Energy (Unit Issue Charge – Auctions) Act 2011* (Cth); *Clean Energy (Unit Issue Charge – Fixed Charge) Act 2011* (Cth); *Clean Energy (Unit Shortfall Charge – General) Act 2011* (Cth); *Climate Change Authority Act 2011* (Cth); *Ozone Protection and Synthetic Greenhouse Gas (Import Levy) Amendment Act 2011* (Cth); *Ozone Protection and Synthetic Greenhouse Gas (Manufacture Levy) Amendment Act 2011* (Cth); *Steel Transformation Plan Act 2011* (Cth).

<sup>58</sup> *Clean Energy Act 2011* (Cth) s 3(a) (repealed).

<sup>59</sup> *Clean Energy Act 2011* (Cth) s 3(b) (repealed).

<sup>60</sup> Ipshita Chaturvedi, 'Was the Clean Energy Act Read with the Minerals Resource Rent Tax an Effective Tax Regime for Restricting the Use and Mining of Coal in Australia?' (2014) 17(1) *The Australasian Journal of Natural Resources Law and Policy* 101, 103 quoting Janet E Milne, 'Environmental Taxation: Why Theory Matters' in Janet E Milne et al (eds), *Critical Issues in Environmental Taxation* (Oxford University Press, 2003) vol 1, 4.

<sup>61</sup> *Clean Energy Act 2011* (Cth) s 3(d) (repealed).

<sup>62</sup> Lisa Capris et al, 'Australia's Carbon Pricing Mechanism' (2011) 2 *Climate Law* 583, 585.

price for carbon for a certain period of time and then transiting to an ETS. This 'hybrid form' or 'hybrid model' was designed in a way to provide stability for and familiarisation with the CPM and its operation.<sup>63</sup>

The design of the CPM was based on the proposal in the 2011 Garnaut Review.<sup>64</sup> The aim was to make GHGe more expensive by placing a cost on emissions, encouraging businesses to emit less.<sup>65</sup> The cost would then be incorporated in the price of the product for the producer. This scheme appears to have been similar to the 'polluter pays principle', which applies in the European Union (EU) and elsewhere.

The CPM covered greenhouse gases, namely, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), sulphur hexafluoride, hydrofluorocarbon and perfluorocarbon (PFC).<sup>66</sup> The *NGER Act 2007* was amended in July 2012 to extend emitters' reporting obligations for the purposes of the CPM.<sup>67</sup> The three phases of the CPM were as follows:<sup>68</sup>

- 1) 1 July 2012 - Fixed price of carbon at \$23 per tonne of CO<sub>2</sub> for 3 years;<sup>69</sup>
- 2) 1 July 2015 - Carbon price determined by the market starting at \$20;
- 3) 2018 onwards - A floating price phase which would be set by markets. At that stage, it was crucial for the Government to set a cap on the total emissions.

Carbon pricing can refer to a variety of different economic instruments to reduce GHGe, which includes carbon taxes and emissions trading.<sup>70</sup> *CEA 2011* s 3(d) clearly stated the objective 'to put a price on greenhouse gas emissions'.<sup>71</sup> The Australian Parliament preferred to have a cap on the amount of emissions that can be emitted annually, and to limit the number of emission permits that would be issued.<sup>72</sup>

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<sup>63</sup> Zahar, Peel and Godden, *Australian Climate Law in Global Context* (Cambridge University Press, 2013) 190.

<sup>64</sup> Garnaut, R., *The Garnaut Review 2011: Australia in the Global Response to Climate Change* (Cambridge University Press, 2011).

<sup>65</sup> Brellen Warry and Eleanor Whyte, 'Carbon Price Mechanism Loses its Floor' (2012) 64(10) *Keeping Good Companies* 618, 618.

<sup>66</sup> *Clean Energy Act 2011* (Cth) s 5 (repealed); *National Greenhouse and Energy Reporting Act 2007* (Cth) s 7; Evgeny Guglyuvatyy and Natalie P. Stoianoff, 'Carbon Policy in Australia – A Political History' (2016) *Green Fiscal Reform for a Sustainable Future* 31, 40.

<sup>67</sup> *Clean Energy (Consequential Amendments) Act 2011* (Cth) s 2.

<sup>68</sup> Brellen Warry and Eleanor Whyte, 'Carbon Price Mechanism Loses its Floor' (2012) 64(10) *Keeping Good Companies* 618, 618.

<sup>69</sup> *Clean Energy Act 2011* (Cth) s 100 (repealed).

<sup>70</sup> Zahar, Peel and Godden, *Australian Climate Law in Global Context* (Cambridge University Press, 2013) xiii.

<sup>71</sup> The *Clean Energy Act 2011* (Cth) was repealed in 2014.

<sup>72</sup> Clive L. Spash, Alex Y. Lo, 'Australia's Carbon Tax: A Sheep in Wolf's Clothing?' (2012) 23(1) *The Economic and Labour Relations Review* 67, 73.

This mechanism only applied to the 500 biggest emitters, 'facilities that directly emit[ed] more than 25,000 tonnes of carbon pollution [per year]'.<sup>73</sup> If the facility emitted more than 25,000 tonnes of CO<sub>2</sub>, it would have to pay for each tonne emitted above the threshold set.<sup>74</sup> The agricultural and transport fuels industries were exempted from the CPM, but other regulatory pricing mechanisms applied.<sup>75</sup> The exemption also covered consumers and small businesses.<sup>76</sup> The transport sector was to pay excise tax on the carbon content of the fuel. As for emissions from the agriculture sector, it was partly regulated under the Carbon Farming Initiative (CFI).<sup>77</sup> The CPM was administered by the Clean Energy Regulator.

The carbon price was projected to result in many benefits such as support to households, increased jobs, support for businesses and communities, lower GHGe, and helping Australia to remain competitive internationally.<sup>78</sup> The CPM was introduced to show the international community the Government's level of seriousness to reduce emissions<sup>79</sup> and, to enable Australia to move towards a low-carbon economy.<sup>80</sup>

#### *2.4.2 Establishment of New Bodies After the Introduction of Carbon Pricing Mechanism*

As a result of the enactment of the clean energy package of legislation in 2011, four new bodies were created: the Clean Energy Regulator (CER);<sup>81</sup> the Climate Change Authority (CCA);<sup>82</sup> the Australian Renewable Energy Agency (ARENA);<sup>83</sup> and the Clean Energy Finance Corporation (CEFC).<sup>84</sup>

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<sup>73</sup> Greg Combet, *Securing a Clean Energy Future: Implementing the Australian Government's Climate Change Plan* (CanPrint Communications Pty Ltd, 2012) 7 <[https://archive.budget.gov.au/2012-13/ministerial\\_statements/ms\\_climate\\_change.pdf](https://archive.budget.gov.au/2012-13/ministerial_statements/ms_climate_change.pdf)>; *Clean Energy Act 2011* (Cth) s 20 (repealed).

<sup>74</sup> *Clean Energy Act 2011* (Cth) s 22(4) (repealed).

<sup>75</sup> Greg Combet, *Securing a Clean Energy Future: Implementing the Australian Government's Climate Change Plan* (CanPrint Communications Pty Ltd, 2012) 8 <[https://archive.budget.gov.au/2012-13/ministerial\\_statements/ms\\_climate\\_change.pdf](https://archive.budget.gov.au/2012-13/ministerial_statements/ms_climate_change.pdf)>.

<sup>76</sup> Greg Combet, *Securing a Clean Energy Future: Implementing the Australian Government's Climate Change Plan* (CanPrint Communications Pty Ltd, 2012) 8 <[https://archive.budget.gov.au/2012-13/ministerial\\_statements/ms\\_climate\\_change.pdf](https://archive.budget.gov.au/2012-13/ministerial_statements/ms_climate_change.pdf)>.

<sup>77</sup> The relevant legislation on Carbon Farming Initiative is the *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth) as amended in 2014.

<sup>78</sup> Larry Dwyer et al, 'Economic Impacts of a Carbon Tax on the Australian Tourism Industry' (2012) 52(2) *Journal of Travel Research* 143, 145-146.

<sup>79</sup> Bruno Zeller and Michael Longo, 'Carbon Reduction Legislation in Australia – What Next?' (2011) 8 *Macquarie Journal of Business Law* 182, 190.

<sup>80</sup> Stefan Speck, 'Carbon Taxation: Two Decades of Experience and Future Prospects' (2013) 4(2) *Carbon Management* 171, 175.

<sup>81</sup> *Clean Energy Act 2011* (Cth) s 4 (repealed), *Clean Energy Regulator Act 2011* (Cth) s 11. The Clean Energy Regulator Act 2011 (Cth) is still in operation and was amended in 2016.

<sup>82</sup> *Clean Energy Act 2011* (Cth) s 4 (repealed).

<sup>83</sup> *Australian Renewable Energy Agency Act 2011* (Cth) s 7. This Act is still in operation and was amended in 2017.

<sup>84</sup> *Clean Energy Finance Corporation Act 2012* (Cth) s 3.

The CER was to administer the CPM.<sup>85</sup> The CCA was to conduct periodic reviews under the Act,<sup>86</sup> and provide advice to the Minister on an appropriate cap level, to enable Australia to meet its international obligations and achieve its objectives under the Act.<sup>87</sup> This approach results in some level of transparency in the system.

The ARENA had a list of functions which included: (a) financially assisting in the research, development and storage of RE information; (b) collecting and analysing information relating to RE; and (c) advising the Minister on RE technology and other functions mentioned in the Act.<sup>88</sup> The CEFC's main function was to deal with investments and liaising with the relevant bodies relating to the investments.<sup>89</sup>

The ARENA and CEFC survived the repeal of most of the Clean Energy package of legislation.<sup>90</sup> In March 2016, the Government announced that the ARENA and CEFC were to administer the \$1 billion Clean Energy Innovation Fund (CEIF).<sup>91</sup> This change was intended to work hand in hand with the Emissions Reduction Fund (ERF), the RET and the National Energy Productivity Plan (NEPP).<sup>92</sup> The CEIF is still an ongoing fund investing in clean energy innovation.<sup>93</sup>

#### *2.4.3 Differing Views on the Carbon Pricing Mechanism*

There were differing views on the use of CPM. Tony Abbott opposed the CPM, labelling Julia Gillard as 'untrustworthy'<sup>94</sup> because, during the election campaign in 2010, Gillard

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<sup>85</sup> *Clean Energy Act 2011* (Cth) s 4 (repealed).

<sup>86</sup> *Clean Energy Act 2011* (Cth) s 4 (repealed).

<sup>87</sup> *Clean Energy Act 2011* (Cth) s 289 (repealed).

<sup>88</sup> *Australian Renewable Energy Agency Act 2011* (Cth) s 8.

<sup>89</sup> *Clean Energy Finance Corporation Act 2012* (Cth) s 9.

<sup>90</sup> Parliament of Australia, *What's Happening with ARENA?* (Web Page)

<[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/Flag\\_Post/2016/September/ARENA-changes](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Flag_Post/2016/September/ARENA-changes)>.

<sup>91</sup> M. Turnbull and G. Hunt, 'Turnbull Government taking strong new approach to clean and renewable energy innovation in Australia' (Joint Media Release, 23 March 2016)

<[https://parlinfo.aph.gov.au/parlInfo/download/media/pressrel/4448864/upload\\_binary/4448864.pdf;fileType=application%2Fpdf#search=%22media/pressrel/4448864%22](https://parlinfo.aph.gov.au/parlInfo/download/media/pressrel/4448864/upload_binary/4448864.pdf;fileType=application%2Fpdf#search=%22media/pressrel/4448864%22)>.

<sup>92</sup> M. Turnbull and G. Hunt, 'Turnbull Government taking strong new approach to clean and renewable energy innovation in Australia' (Joint Media Release, 23 March 2016) 2

<[https://parlinfo.aph.gov.au/parlInfo/download/media/pressrel/4448864/upload\\_binary/4448864.pdf;fileType=application%2Fpdf#search=%22media/pressrel/4448864%22](https://parlinfo.aph.gov.au/parlInfo/download/media/pressrel/4448864/upload_binary/4448864.pdf;fileType=application%2Fpdf#search=%22media/pressrel/4448864%22)>.

<sup>93</sup> CEFC, *Innovation Fund* (Web Page) <<https://www.cefc.com.au/where-we-invest/financing-solutions/innovation-fund/>>.

<sup>94</sup> Ken Chan, 'Don't forget the weather in the axing of the carbon tax in Australia' (2015) 6 (1-2) *Carbon Management* 63, 63.

promised that there would be no 'carbon tax'.<sup>95</sup> The CPM is sometimes labelled or referred to as a 'carbon tax',<sup>96</sup> by opponents. However, the CPM and the Clean Energy package of legislation used the words 'carbon price' and not a 'carbon tax'.<sup>97</sup>

The terms 'carbon price' and 'carbon tax' were used interchangeably by the Liberal party. However, the Australian Parliament, through the Clean Energy package of legislation, referred to a carbon pricing scheme that required the purchase of permits to emit harmful GHGe and not a 'tax'.

The CPM was received positively among economists and academics. Economists were of the view that, in the long run, the CPM would be a good choice. Many academics also supported the CPM.<sup>98</sup> Ekins and Barker stated that the tax:

tackles an accepted economic problem, i.e. a damaging externality; generates revenues that are accepted to grow with income; tends to be simple and cheap to administer; can stimulate energy savings, innovation and investment in clean technology and so economic growth; is likely to have minimal regressive side-effects allowing compensation using a small fraction of the expected revenues.<sup>99</sup>

Bubna-Litic and Stoianoff were of the view that the CPM supported innovation by: (a) encouraging companies with high carbon intensity to move into practices that involves less carbon to avoid high costs from the 'tax'; (b) Government directly investing into new technologies; and (c) allowing low-carbon intensive players to enter the market.<sup>100</sup> The move to the CPM was to enable the industries to adapt to the CPM system and then allow them to make the necessary changes.<sup>101</sup> The CPM was also argued by the Australian Government as

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<sup>95</sup> Evgeny Guglyuvatyy and Natalie P. Stoianoff, 'Carbon Policy in Australia – A Political History' (2016) *Green Fiscal Reform for a Sustainable Future* 31, 39.

<sup>96</sup> Evgeny Guglyuvatyy and Natalie P. Stoianoff, 'Carbon Policy in Australia – A Political History' (2016) *Green Fiscal Reform for a Sustainable Future* 31, 40.

<sup>97</sup> Ken Chan, 'Legislation of a historic but politically unpopular carbon tax in Australia' (2012) 3(3) *Carbon Management* 243, 244.

<sup>98</sup> Ken Chan, 'Legislation of a historic but politically unpopular carbon tax in Australia' (2012) 3(3) *Carbon Management* 243, 244.

<sup>99</sup> Clive L. Spash, Alex Y. Lo, 'Australia's Carbon Tax: A Sheep in Wolf's Clothing?' (2012) 23(1) *The Economic and Labour Relations Review* 67, 70 quoting Ekins, P. and Barker, T. (2001) 'Carbon taxes and carbon emissions trading', *Journal of Economic Surveys*, 15(3), pp. 325-376.

<sup>100</sup> Karen Bubna-Litic, Natalie Stoianoff, 'Carbon pricing and renewable energy innovation: A comparison of Australian, British and Canadian carbon pricing policies' (2014) 31 *Environmental and Planning Law Journal* 368, 382.

<sup>101</sup> Stefan Speck, 'Carbon Taxation: Two Decades of Experience and Future Prospects' (2013) 4(2) *Carbon Management* 171, 175.

reducing dependence on fossil fuels and create more jobs in the green sector.<sup>102</sup> Although the CPM has its advantages, it was made to be 'politically toxic'.<sup>103</sup>

The opposition political party and business leaders heavily criticised the CPM, arguing that it increased the difficulty of Australian businesses to compete in the international market.<sup>104</sup> The mechanism was criticised for increasing the cost of living and causing a threat to jobs.<sup>105</sup> It was also argued that the *CEA 2011* might reduce the competitiveness of emissions intensive and trade-exposed industries which would eventually impact Australia's capacity to remain competitive in the fossil fuel industry.<sup>106</sup> Australia's significant involvement in the fossil fuel industry, especially mining, could be affected by the CPM, as mining companies would face lower profit margins.<sup>107</sup>

Notwithstanding criticism, the CPM was considered advantageous for the Australian government in terms of generating profits. Revenues generated were to be used for other carbon reduction projects and returned to the economy. Zeller and Longo were of the view that appropriate knowledge was not given to the public by the Australian government with regard to the CPM, regarding the need of such a mechanism and its effects.<sup>108</sup>

The introduction of the CPM did reduce GHGe<sup>109</sup> and Australia's dependence on fossil fuels; 5.5% reduction from the electricity sector between September 2012 to September 2013 which occurred after the introduction of a cap and trade scheme.<sup>110</sup> A study by the Australian National University found that, because of carbon pricing, Australia managed to cut its CO<sub>2</sub>

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<sup>102</sup> Fredrik NG Anderson; Peter Karpestam, 'The Australian Carbon Tax: A Step in the Right Direction but Not Enough' (2012) 3(3) *Carbon Management* 293, 294, citing Gillard J. *Introduction of the Clean Energy Bill 2011* Speech before the Australian Parliament, 13 September 2011 <http://www.pm.gov.au/press-office/introduction-clean-energy-bill-2011-canberra>.

<sup>103</sup> Neil Gunningham, Megan Bowman, 'Energy regulation for a low carbon economy: Obstacles and opportunities' (2016) 33 *Environmental and Planning Law Journal* 118, 135.

<sup>104</sup> Fredrik NG Anderson; Peter Karpestam, 'The Australian Carbon Tax: A Step in the Right Direction but Not Enough' (2012) 3(3) *Carbon Management* 293, 294.

<sup>105</sup> Ken Chan, 'Legislation of a historic but politically unpopular carbon tax in Australia' (2012) 3(3) *Carbon Management* 243, 244.

<sup>106</sup> Bruno Zeller and Michael Longo, 'Australia's Clean Energy Act: A New Measure in the Global Carbon Market' (2013) 10(2) *Loyola University Chicago International Law Review* 179, 182.

<sup>107</sup> Ken Chan, 'Legislation of a historic but politically unpopular carbon tax in Australia' (2012) 3(3) *Carbon Management* 243, 244.

<sup>108</sup> Bruno Zeller and Michael Longo, 'Australia's Clean Energy Act: A New Measure in the Global Carbon Market' (2013) 10(2) *Loyola University Chicago International Law Review* 179, 185.

<sup>109</sup> Karen Bubna-Litic, Natalie Stoianoff, 'Carbon pricing and renewable energy innovation: A comparison of Australian, British and Canadian carbon pricing policies' (2014) 31 *Environmental and Planning Law Journal* 368, 380.

<sup>110</sup> Department of the Environment, Parliament of Australia, *Australian National Greenhouse Accounts: Quarterly Update of Australia's National Greenhouse Gas Inventory: September Quarter 2013* (Report, 2014) 3 <[http://www.environment.gov.au/system/files/resources/e18788bd-2a8a-49d1-b797-307a9763c93f/files/quartlerly-update-september-2013\\_1.pdf](http://www.environment.gov.au/system/files/resources/e18788bd-2a8a-49d1-b797-307a9763c93f/files/quartlerly-update-september-2013_1.pdf)>.

emissions from the electricity sector by 17 million tonnes.<sup>111</sup> The Climate Council also acknowledged that the CPM assisted in the reduction of GHGe in Australia.<sup>112</sup>

Despite significant discussions about the CPM increasing cost of living and prices of electricity, the CPM raised \$6.6 billion of revenue in years 2012-2013.<sup>113</sup> It was argued to be the most successful piece of climate change policy<sup>114</sup> following the 'principle of revenue neutrality', meaning 'recycling all CO<sub>2</sub> tax revenues back to the economy so that the overall tax burden of the relevant economy remains constant.'<sup>115</sup>

The CPM worked effectively in Australia, in reducing GHGe.<sup>116</sup> When the CPM was in effect, GHGe in Australia dropped significantly, particularly in years 2011 and 2012.<sup>117</sup> Guglyuvatyy and Stoianoff argued that the approach taken by the Gillard government in introducing the CPM was the most successful.<sup>118</sup> According to Professor Jotzo, 'carbon pricing provides a consistent framework of price-based incentives'.<sup>119</sup>

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<sup>111</sup> T. Flannery, Gerry Hueston and Andrew Stock, *Lagging Behind: Australia and The Global Response to Climate Change* (Report, 2014) 36  
<<https://www.climatecouncil.org.au/uploads/211ea746451b3038edfb70b49aee9b6f.pdf>>.

<sup>112</sup> G Bourne et al, *Australia's Rising Greenhouse Gas Emissions* (Report, 2018) 12 <[https://www.climatecouncil.org.au/wp-content/uploads/2018/06/CC\\_MVSA0143-Briefing-Paper-Australias-Rising-Emissions\\_V8-FA\\_Low-Res\\_Single-Pages3.pdf](https://www.climatecouncil.org.au/wp-content/uploads/2018/06/CC_MVSA0143-Briefing-Paper-Australias-Rising-Emissions_V8-FA_Low-Res_Single-Pages3.pdf)>.

<sup>113</sup> Joanna Heath, '\$7.6bn-a-year Budget Cost to Chop Carbon Price', *The Australian Financial Review* (Web Page, 15 February 2014) <<https://www.afr.com/news/76bnayear-budget-cost-to-chop-carbon-tax-20140214-ixsf6>>.

<sup>114</sup> Evgeny Guglyuvatyy and Natalie P. Stoianoff, 'Carbon Policy in Australia – A Political History' (2016) *Green Fiscal Reform for a Sustainable Future* 31, 47.

<sup>115</sup> Stefan Speck, 'Carbon Taxation: Two Decades of Experience and Future Prospects' (2013) 4(2) *Carbon Management* 171, 176.

<sup>116</sup> Ndevr Environmental, *Tracking 2 Degrees – FY18 Q4* (Web Page) <<http://ndevr.com.au/environmental/tracking-2-degrees-fy18-q4>>.

<sup>117</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2017* (Report, 18 May 2018) 5 <<https://www.environment.gov.au/system/files/resources/7b9824b8-49cc-4c96-b5d6-f03911e9a01d/files/nggi-quarterly-update-dec-2017-revised.pdf>>.

<sup>118</sup> Evgeny Guglyuvatyy and Natalie P. Stoianoff, 'Carbon Policy in Australia – A Political History' (2016) *Green Fiscal Reform for a Sustainable Future* 31, 47.

<sup>119</sup> Environment and Communications References Committee, Parliament of Australia, *Direct Action: Paying Polluters to Halt Global Warming?* (Report, March 2014) 4 <[https://www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Environment\\_and\\_Communications/Direct\\_Action\\_Plan/Report/index](https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/Direct_Action_Plan/Report/index)>.



## 2.5 Repeal of the Clean Energy Act 2011 (Cth), Associated Legislation and the Carbon Pricing Mechanism

Tony Abbott became Australia's Prime Minister on 18 September 2013.<sup>120</sup> His first action was to repeal the CPM and the clean energy package legislation in the following year,<sup>121</sup> saying that evidence on climate change was 'absolute crap'.<sup>122</sup> His views resulted in the removal of the Climate Commission (a Government sponsored body) and replacement with the Climate Council (a privately funded independent non-profit organisation) to provide advice on climate change.<sup>123</sup>

The *CEA 2011* and its associated legislation, and the CPM were repealed in 2014. Australia is said to be the first country to move backwards in repealing a fully functioning CPM.<sup>124</sup> After the repeal, there was a drop in RE investment.<sup>125</sup> According to Bloomberg New Energy Finance, in 2014, the decline in RE investment was 35%.<sup>126</sup>

Those in the mining industry and other affected stakeholders, were satisfied with the repeal of the CPM<sup>127</sup> as it increased business cost and affected their profit margins. Further, the repeal of the CPM gained support to improve business competitiveness, encourage investment and drive job creation and growth of the economy.

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<sup>120</sup> National Archives of Australia, *Australia's Prime Minister's* (Web Page) <<http://primeministers.naa.gov.au/primeministers/abbott/>>.

<sup>121</sup> Evgeny Guglyuvatyy and Natalie P. Stoianoff, 'Carbon Policy in Australia – A Political History' (2016) *Green Fiscal Reform for a Sustainable Future* 31, 42.

<sup>122</sup> Ken Chan, 'Don't forget the weather in the axing of the carbon tax in Australia' (2015) 6 (1-2) *Carbon Management* 63, 66.

<sup>123</sup> Ken Chan, 'Don't forget the weather in the axing of the carbon tax in Australia' (2015) 6 (1-2) *Carbon Management* 63, 64; Climate Council, *About Us* (Web Page) <<https://www.climatecouncil.org.au/about/>>.

<sup>124</sup> Environment and Communications References Committee, Parliament of Australia, *Direct Action: Paying Polluters to Halt Global Warming?* (Report, March 2014) 52 <[https://www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Environment\\_and\\_Communications/Direct\\_Action\\_Plan/Report/index](https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/Direct_Action_Plan/Report/index)>.

<sup>125</sup> Ken Chan, 'Don't forget the weather in the axing of the carbon tax in Australia' (2015) 6 (1-2) *Carbon Management* 63, 66.

<sup>126</sup> Bloomberg New Energy Finance, *Rebound in Clean Energy Investment in 2014 Beats Expectations* (Web Page) <<https://about.bnef.com/blog/rebound-clean-energy-investment-2014-beats-expectations/>>.

<sup>127</sup> Ken Chan, 'Don't forget the weather in the axing of the carbon tax in Australia' (2015) 6 (1-2) *Carbon Management* 63, 65.

### *2.5.1 Why Were the Clean Energy Act 2011 (Cth) and Clean Energy Package of Legislation Repealed?*

One question that arises is whether the Clean Energy Act would have achieved its 'desired result'.<sup>128</sup> The *CEA 2011* was a comprehensive and detailed piece of legislation. There were positive results shown from the date the Act was implemented; GHGe was reducing from 2011 until 2014.<sup>129</sup> However, the *CEA 2011* and the clean energy package of legislation were all repealed in 2014. The reasons for the repeal are discussed below.

#### *2.5.1(a) Political Influence in the Fossil Fuel Industry*

The CPM's repeal cannot be attributed to its poor design or implementation issues. The Abbott Government's policies led to political uncertainty regarding efforts to reduce GHGe. This action by the Abbott Government was criticised; Abbott did not have a sense of urgency towards the issue of climate change (it may be relevant that the fossil fuel industries were large donors to the Liberal party).<sup>130 131</sup>

Australia's economy is highly dependent on the oil, gas and mining industries. As such, there are powerful vested interests in these industries. Due to the heavy reliance on the fossil fuel industry, the Abbott Government replaced the CPM with the Direct Action Plan (DAP). The centrepiece of the DAP is the Emissions Reduction Fund (ERF). This is discussed further in section 3.2.

#### *2.5.1(b) Was the Clean Energy Legislation Package a Flawed and/or Ineffective Regulatory Strategy?*

The *CEA 2011* and Clean Energy package legislation covered a broad range of industries with the aim of reducing GHGe in Australia and fostering early transition to a low

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<sup>128</sup> Bruno Zeller and Michael Longo, 'Australia's Clean Energy Act: A New Measure in the Global Carbon Market' (2013) 10(2) *Loyola University Chicago International Law Review* 179, 181.

<sup>129</sup> Ndevr Environmental, *Tracking 2 Degrees – FY18 Q4* (Web Page) <<http://ndevr.com.au/environmental/tracking-2-degrees-fy18-q4>>.

<sup>130</sup> White A, 'Why Tony Abbott Wants To Abolish The Carbon Price', *The Guardian* (online, 18 September 2013) <<https://www.theguardian.com/environment/southern-crossroads/2013/sep/18/tony-abbott-abolish-carbon-price>>.

<sup>131</sup> According to the Australian Electoral Commission, oil, gas and mining companies were the major donors to the Liberal party prior to the 2013 election as follows: Woodside Energy Limited (\$129,500.00); CST Mining Group Limited (\$50,000.00); Chevron Australia Pty Limited (\$47,300.00); Santos Limited (\$42,700.00); Whitehaven Coal Limited (\$20,000.00); and other companies with lower donations. Source: Australian Electoral Commission, *Summary of Donations Reported by Donors – By Party – 2013-2014* (Web Page) <<https://periodicdisclosures.aec.gov.au/SummaryDonor.aspx>>.

carbon energy system that would be beneficial economically and environmentally in the long term and, hence, good for the Australian society.

It was argued by politicians and academics that the CPM raised the cost of living, as extra costs incurred by businesses were passed down to the consumers. By doing this, the author Zeller asserts, the purpose of the *CEA 2011* failed.<sup>132</sup> However, there is another argument: revenues generated from the CPM would have been used to reduce the burden on consumers and for other projects that can reduce GHGe. Further, it has been argued that the Government would have spent most of the revenue from the CPM on tax relief to help lower income households.<sup>133</sup>

The *CEA 2011* had advantages and disadvantages. The significant advantages of the *CEA 2011* include: (a) ensuring compliance by imposing fines and imprisonment terms; (b) making polluters pay for their emissions beyond the threshold limit; and (c) generating revenue for the Government to be used for other projects to reduce GHGe.

Prominent disadvantages of the *CEA 2011*, were: (a) lesser understanding towards businesses, increasing their costs and impacting their profits, (b) administrative costs, (c) a risk of carbon leakage as a result of the cost placed by the Clean Energy package of legislation, and businesses transferring their production to other countries resulting in increasing emissions, (d) uncertainty, and (e) complexity.<sup>134</sup>

The *CEA 2011* is demonstrably a complex piece of legislation. Having a simple piece of legislation might be beneficial considering Australia's political state and economy<sup>135</sup> as such legislation ensures that emitters comply with the system because it is binding in nature. Further, the CPM is legislated and, thus, binding, except for relevant sectors stated in the Act. Legislation is essential for an effective system of enforcement of a scheme like the CPM. Legislation alone is insufficient. The Government needs to commit the resources to administering and enforcing the legislation.

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<sup>132</sup> Bruno Zeller and Michael Longo, 'Australia's Clean Energy Act: A New Measure in the Global Carbon Market' (2013) 10(2) *Loyola University Chicago International Law Review* 179, 189.

<sup>133</sup> Bruno Zeller and Michael Longo, 'Australia's Clean Energy Act: A New Measure in the Global Carbon Market' (2013) 10(2) *Loyola University Chicago International Law Review* 179, 184.

<sup>134</sup> Bruno Zeller and Michael Longo, 'Australia's Clean Energy Act: A New Measure in the Global Carbon Market' (2013) 10(2) *Loyola University Chicago International Law Review* 179, 188; Parliament of Australia, *Chapter 3 The Clean Energy Package and The Impact of Its Proposed Repeal* (Web Page)

<[https://www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Environment\\_and\\_Communications/Direct\\_Action\\_Plan/Report/c03](https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/Direct_Action_Plan/Report/c03)>.

<sup>135</sup> Bruno Zeller and Michael Longo, 'Australia's Clean Energy Act: A New Measure in the Global Carbon Market' (2013) 10(2) *Loyola University Chicago International Law Review* 179, 187.

Legislation can set targets, create institutions and provide funding to make policy reversals less likely to happen. An instrument is legally binding when it is 'created through a recognised law making process'.<sup>136</sup> Legislation ensures compliance, as failing to abide by it may give rise to sanctions or civil penalties. Therefore, with legislation, the targets become self-executing as parties are obliged to follow, and GHGe can presumably be reduced.

The *CEA 2011* was a comprehensive and detailed piece of legislation. The *CEA 2011* and the clean energy package of legislation provided a legal framework for the CPM and transition to an ETS, which demonstrated positive results in the few years of its implementation.<sup>137</sup> The legislation was not flawed or ineffective; the carbon price reduced GHGe notwithstanding the cap and trade phase never came into operation.<sup>138</sup>

Two factors primarily contributed to the demise of the CPM: lack of political leadership and consistent climate goals; and the strength of a group of emissions-intensive sectors which wanted to postpone or delay Australia from transiting towards a low-emissions economy.<sup>139</sup> Further, the media contributed to the demise of the CPM by projecting the CPM to be against the interest of the mining industry.<sup>140</sup>

The change of political parties in power from the Coalition to Labor, and Australia's heavy dependence on the mining industry, led to drastic changes in climate law. Policy reversals occurred over different political cycles, due to lack of bipartisanship on climate policies in Australia. This is evident through the repeal of the *CEA 2011*. However, some mitigation measures such as RE funding have been maintained through different political cycles. The CPM should have been given more time to demonstrate results instead of repealing a functioning mechanism and replacing it with the ERF and Safeguard Mechanism (SM).

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<sup>136</sup> D. Bodansky, 'Legally Binding Versus Non-legally Binding Instruments' (Web Page) 159 <<https://voxeu.org/sites/default/files/file/bodansky.pdf>>.

<sup>137</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2017* (Report, 18 May 2018) 5 <<https://www.environment.gov.au/system/files/resources/7b9824b8-49cc-4c96-b5d6-f03911e9a01d/files/nggi-quarterly-update-dec-2017-revised.pdf>>.

<sup>138</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2017* (Report, 18 May 2018) 5 <<https://www.environment.gov.au/system/files/resources/7b9824b8-49cc-4c96-b5d6-f03911e9a01d/files/nggi-quarterly-update-dec-2017-revised.pdf>>.

<sup>139</sup> Elena de Lemos Pinto Aydos, *Paying the Carbon Price: The Subsidisation of Heavy Polluters under Emissions Trading Schemes*, (Edward Elgar Publishing Limited, 2017) 76.

<sup>140</sup> Wendy Bacon and Chris Nash, 'Playing the Media Game: The Relative (in)visibility of Coal Industry Interests in Media Reporting of Coal as a Climate Change Issue in Australia' (2012) 13 *Journalism Studies* 243, 243-258.

The CPM has shown that carbon taxes and a cap and trade system are administratively feasible in Australia and has provided evidence as to its effectiveness by reducing GHGe. Therefore, if policy reversals were reduced, Australia may well have the potential to improve its credibility and meet its emission reduction commitments under the *PA*.

Australia's policy reversal raises a legal question as to how a Parliament can enact legislation that will achieve a greater stability of legislative purpose. There are some features that lead to more stable legislation such as acceptability of the law among political parties, degree of compliance with the law, and its binding effect.<sup>141</sup> In order to have stable legislation, there must be consensus and acceptability of the law.<sup>142</sup> The political changes and lack of an appropriate consensus on the CPM led to its repeal.

### 3.0 Current Climate Change Mitigation Legislation and Policies

Australia's clean energy framework currently includes: the NGER Scheme, the ERF; SM; the RET; the NEPP and other State-based mechanisms.<sup>143</sup> The question that arises is whether the current legislation and policies can help Australia to reduce GHGe in the fossil fuel industry and assist Australia to achieve its *PA* targets. To answer this question, the operation of the current policies will be analysed.

#### 3.1 National Greenhouse and Energy Reporting Scheme

This scheme was established with a single national reporting framework for emissions. The legal framework for the establishment of the NGER scheme is the *NGER Act 2007* (Cth). This Act provides a legal framework for the reporting of GHGe and other information under the NGER scheme legislation. The legislation provides rules for those required to register and report their GHGe, the measurement system and what must be reported.<sup>144</sup>

*NGER Act 2007* (Cth) pt 2 provides for the registration of emissions. The scheme also provides a measurement system for companies to measure their emissions. This is done to

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<sup>141</sup> A. Alott, 'The Effectiveness of Laws' (1981) 15(2) *Valparaiso University Law Review* 229, 234-242.

<sup>142</sup> A. Alott, 'The Effectiveness of Laws' (1981) 15(2) *Valparaiso University Law Review* 229, 242.

<sup>143</sup> Carbon Market Institute, *2017 Australian Climate Policy Review Submission* (Report, May 2017) 7 <<http://marketplace.carbonmarketinstitute.org/wp-content/uploads/2018/10/CMI-Submission-2017-Australian-Climate-Change-Policy-Review.pdf>>.

<sup>144</sup> Climate Change Authority, Parliament of Australia, *Review of The National Greenhouse and Energy Reporting Legislation* (Consultation Paper, 31 July 2018) 7 <<http://climatechangeauthority.gov.au/sites/prod.climatechangeauthority.gov.au/files/files/2018%20NGER%20Review/CP/NGERCP.pdf>>.

achieve transparency, accuracy and completeness in the reporting process. Reports must be submitted by 31 October each year.<sup>145</sup> Companies that fail to comply with the legislation face civil penalties.<sup>146</sup>

Under this scheme, companies have to report their emissions of carbon dioxide, methane, nitrous oxide, sulphur hexafluoride, and specified hydrofluorocarbons and perfluorocarbons.<sup>147</sup> The companies must report their direct emissions released (scope 1 emissions) and indirect emissions (scope 2 emissions).<sup>148</sup> The scheme covers emissions from various sectors such as electricity generation and use, fuel, waste disposal and fugitive emissions.<sup>149</sup>

The Department of Industry, Science, Energy and Resources<sup>150</sup> and the Clean Energy Regulator<sup>151</sup> work together and play an important role in the NGER scheme and SM. The Department provides an oversight on policy development for reporting and SM, while the Clean Energy Regulator administers the schemes and makes sure it is enforced properly and complied with. This scheme supports the reporting system required by the SM.

### *3.2 Direct Action Plan*

While the NGER scheme highlights the reporting of GHGe, the DAP was introduced to reduce Australia's GHGe adequately and cost-effectively. The DAP was introduced by the

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<sup>145</sup> Climate Change Authority, Parliament of Australia, *Review of The National Greenhouse and Energy Reporting Legislation* (Consultation Paper, 31 July 2018) 7  
<<http://climatechangeauthority.gov.au/sites/prod.climatechangeauthority.gov.au/files/files/2018%20NGER%20Review/CP/NGERCP.pdf>>.

<sup>146</sup> *National Greenhouse and Energy Reporting Act 2007* (Cth) s 29 and 30.

<sup>147</sup> *National Greenhouse and Energy Reporting Act 2007* (Cth) s 3 and 7A.

<sup>148</sup> Climate Change Authority, Parliament of Australia, *Review of The National Greenhouse and Energy Reporting Legislation* (Consultation Paper, 31 July 2018)  
<<http://climatechangeauthority.gov.au/sites/prod.climatechangeauthority.gov.au/files/files/2018%20NGER%20Review/CP/NGERCP.pdf>> 10.

<sup>149</sup> Climate Change Authority, Parliament of Australia, *Review of The National Greenhouse and Energy Reporting Legislation* (Consultation Paper, 31 July 2018) 10  
<<http://climatechangeauthority.gov.au/sites/prod.climatechangeauthority.gov.au/files/files/2018%20NGER%20Review/CP/NGERCP.pdf>>.

<sup>150</sup> This Department was created by Administrative Arrangements Order C2020Q00002 on 1/2/2020.

<sup>151</sup> The agency is constituted by the *Clean Energy Regulator Act 2011* (Cth).

Abbott Government as a new mitigation policy after abolishing the CPM and repealing the clean energy package of legislation. The core policies of this plan are the ERF and SM.<sup>152</sup>

### 3.2.1 Emissions Reduction Fund

An important policy of the DAP was the ERF. The Government's aim is to 'reduce emissions at lowest cost over the period to 2020, and make a contribution towards Australia's 2020 emissions reduction target of five percent below 2000 levels by 2020.'<sup>153</sup> The ERF is a voluntary scheme of taxpayer funded projects to reduce or sequester GHGe; it does not impose any binding limits on carbon emissions. For this reason, the DAP is said to be 'misleadingly named' and 'unlikely to facilitate the requisite carbon emissions [reduction] within the required timeframe'.<sup>154</sup>

The ERF was enacted through the *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth), as amended in 2014; *Carbon Credits (Carbon Farming Initiative) Regulations 2011* (Cth); and *Carbon Credits (Carbon Farming Initiative) Rule 2015* (Cth). The first objective of the *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth) is to:

remove greenhouse gases from the atmosphere, and avoid emissions of greenhouse gases, in order to meet Australia's obligations under any or all of the following: (a) the Climate Change Convention; (b) the Kyoto Protocol; (c) an international agreement (if any) that is the successor (whether immediate or otherwise) to the Kyoto Protocol.<sup>155</sup>

The ERF also uses the existing reporting scheme, the *NGER Act 2007*. The ERF is administered by the Clean Energy Regulator; the Government's commitment is AUD\$2.55 billion,<sup>156</sup> and it works on three principles: 'lowest-cost emissions reduction'; 'genuine emissions reductions'; and 'streamlined administration'.<sup>157</sup>

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<sup>152</sup> Australian Government, *Australia's 2030 climate change target* (Web Page, 2015) 2 <<https://www.environment.gov.au/system/files/resources/c42c11a8-4df7-4d4f-bf92-4f14735c9baa/files/factsheet-australias-2030-climate-change-target.pdf>>.

<sup>153</sup> Australian Government, Parliament of Australia, *Emissions Reduction Fund White Paper* (Report, 2014) 8 <[https://www.environment.gov.au/system/files/resources/1f98a924-5946-404c-9510-d440304280f1/files/emissions-reduction-fund-white-paper\\_0.pdf](https://www.environment.gov.au/system/files/resources/1f98a924-5946-404c-9510-d440304280f1/files/emissions-reduction-fund-white-paper_0.pdf)>.

<sup>154</sup> Neil Gunningham, Megan Bowman, 'Energy regulation for a low carbon economy: Obstacles and opportunities' (2016) 33 *Environmental and Planning Law Journal* 118, 122.

<sup>155</sup> *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth) s 3(2).

<sup>156</sup> Australian Government, Parliament of Australia, *Emissions Reduction Fund White Paper* (Report 2014) 8 <<http://www.environment.gov.au/system/files/resources/1f98a924-5946-404c-9510-d440304280f1/files/erf-white-paper.pdf>>.

<sup>157</sup> Australian Government, Parliament of Australia, *Emissions Reduction Fund White Paper* (Report, 2014) 8 <[https://www.environment.gov.au/system/files/resources/1f98a924-5946-404c-9510-d440304280f1/files/emissions-reduction-fund-white-paper\\_0.pdf](https://www.environment.gov.au/system/files/resources/1f98a924-5946-404c-9510-d440304280f1/files/emissions-reduction-fund-white-paper_0.pdf)>.

Structurally, there are three mechanisms under the ERF: emissions crediting, purchasing and the SM. The main idea behind the ERF is that the ‘Government will pay for projects that will reduce CO<sub>2</sub> emissions “at least cost”’.<sup>158</sup> This means purchasing ‘abatement commitments via an auction mechanism from polluting firms’.<sup>159</sup> Companies undertake projects such as reforestation, efficient use of appliances and other activities voluntarily, and an incentive is given upon completion; participants will receive Australian carbon credit units (ACCUs).<sup>160</sup> According to Hawkins, this ‘model of paying polluters is an unusual way of addressing a policy problem’.<sup>161</sup>

Under the ERF scheme, there are a number of activities<sup>162</sup> that allow participants to earn ACCUs. For each tonne of CO<sub>2</sub> equivalent stored or avoided by doing a project, one ACCU is earned<sup>163</sup> and can be sold to the Government. A business that wants to participate can apply to the ERF and register the project with the Clean Energy Regulator (CER).<sup>164</sup> After that, the participant has to go through an auction process.<sup>165</sup> Once successful at the auction, the participant enters into a contract with the CER.<sup>166</sup> After completing the project, the

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<sup>158</sup> Parliament of Australia, *Direct Action Plan* (Web Page)

<[https://www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Environment\\_and\\_Communications/Direct\\_Action\\_Plan/Report/c05](https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/Direct_Action_Plan/Report/c05)>.

<sup>159</sup> Harry Clarke et al, ‘How much abatement will Australia’s Emissions Reduction buy?’ (CEEP Working Paper 1416, Crawford School of Public Policy, Australian National University, 2014) 1.

<sup>160</sup> Cotton Australia, ‘New government policy: scrapping the carbon tax and implementing the Direct Action Plan – briefing paper’ (Web Page)  
<[http://cottonaustralia.com.au/uploads/publications/BRIEFING\\_New\\_Fed\\_climate\\_change\\_policy.pdf](http://cottonaustralia.com.au/uploads/publications/BRIEFING_New_Fed_climate_change_policy.pdf)>, archived at

<[https://web.archive.org/web/20190320124831/http://cottonaustralia.com.au/uploads/publications/BRIEFING\\_New\\_Fed\\_climate\\_change\\_policy.pdf](https://web.archive.org/web/20190320124831/http://cottonaustralia.com.au/uploads/publications/BRIEFING_New_Fed_climate_change_policy.pdf)>;

Department of the Environment and Energy, Parliament of Australia, *The Emissions Reduction Fund – what it means for you* (Report, 2019) 8

<<https://www.environment.gov.au/system/files/resources/20e963a0-0226-4131-9b88-ff0c754edea1/files/erf-what-it-means-you.pdf>>.

<sup>161</sup> John Hawkins, ‘The Emissions Reduction Fund: a critique’ (Conference Paper, Australia New Zealand Society for Ecological Economics 2013 Conference, 2013) 243, 244.

<sup>162</sup> Activities include reforestation, savannah burning, usage of efficient appliances and other similar projects.

<sup>163</sup> Clean Energy Regulator, *About the Emissions Reduction Fund* (Web Page, 15 February 2016)  
<<http://www.cleanenergyregulator.gov.au/ERF/About-the-Emissions-Reduction-Fund>>.

<sup>164</sup> Department of the Environment and Energy, Parliament of Australia, *The Emissions Reduction Fund – what it means for you* (Report, 2019) 8

<<https://www.environment.gov.au/system/files/resources/20e963a0-0226-4131-9b88-ff0c754edea1/files/erf-what-it-means-you.pdf>>.

<sup>165</sup> Department of the Environment and Energy, Parliament of Australia, *The Emissions Reduction Fund – what it means for you* (Report, 2019) 8

<<https://www.environment.gov.au/system/files/resources/20e963a0-0226-4131-9b88-ff0c754edea1/files/erf-what-it-means-you.pdf>>.

<sup>166</sup> Department of the Environment and Energy, Parliament of Australia, *The Emissions Reduction Fund – what it means for you* (Report, 2019) 8

<<https://www.environment.gov.au/system/files/resources/20e963a0-0226-4131-9b88-ff0c754edea1/files/erf-what-it-means-you.pdf>>.



participant will receive ACCUs.<sup>167</sup> The participant can then transfer the ACCUs to the CER and receive the payment.<sup>168</sup>

Existing participants in the Carbon Farming Initiative were moved into the ERF. Their ACCUs from the existing Carbon Farming Initiative projects are bought by the Government via ERF auctions, which allow the participants to get a return from their eligible projects after the repeal of the CPM.<sup>169</sup>

The ERF does not employ the 'polluter pays' principle to reduce emissions.<sup>170</sup> While the CPM was designed to make businesses pay the Government for the right to emit, the ERF is designed so that the Government uses the taxpayer's money to pay emitters to reduce their emissions. In some cases, the Government under the ERF scheme is not even paying emitters but paying others to sequester emissions. This is inconsistent with the 'polluter pays' principle.

The ERF provides support to businesses, farmers, landholders and communities, to take actions that can reduce GHGe.<sup>171</sup> Project activities that are undertaken allow the generation of carbon offsets.<sup>172</sup> The project activities can be either 'approved under the existing (or expanded) Carbon Farming Initiative mechanism, or those which create abatement by operating below "business as usual" baseline'.<sup>173</sup> The activities would include reforestation, savannah burning, using efficient appliances and other similar projects which

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<sup>167</sup> Department of the Environment and Energy, Parliament of Australia, *The Emissions Reduction Fund – what it means for you* (Report, 2019) 8  
<<https://www.environment.gov.au/system/files/resources/20e963a0-0226-4131-9b88-ff0c754edea1/files/erf-what-it-means-you.pdf>>.

<sup>168</sup> Department of the Environment and Energy, Parliament of Australia, *The Emissions Reduction Fund – what it means for you* (Report, 2019) 8  
<<https://www.environment.gov.au/system/files/resources/20e963a0-0226-4131-9b88-ff0c754edea1/files/erf-what-it-means-you.pdf>>.

<sup>169</sup> Australian Government, Parliament of Australia, *Emissions Reduction Fund White Paper* (Report, 2014) 12 <<http://www.environment.gov.au/system/files/resources/1f98a924-5946-404c-9510-d440304280f1/files/erf-white-paper.pdf>>.

<sup>170</sup> Harry Clarke et al, 'How much abatement will Australia's Emissions Reduction buy?' (CEP Working Paper 1416, Crawford School of Public Policy, Australian National University, 2014) 2.

<sup>171</sup> Department of the Environment and Energy, *About the Climate Solutions Fund - Emissions Reduction Fund* (Web Page) <<http://www.environment.gov.au/climate-change/government/emissions-reduction-fund/about>>.

<sup>172</sup> Department of the Environment and Energy, Parliament of Australia, *2017 Review of Climate Change Policies* (Report, December 2017) 18  
<<https://www.environment.gov.au/system/files/resources/18690271-59ac-43c8-ae1-92d930141f54/files/2017-review-of-climate-change-policies.pdf>>.

<sup>173</sup> Cotton Australia, 'New government policy: scrapping the carbon tax and implementing the Direct Action Plan – briefing paper' (Web Page) 2  
<[http://cottonaustralia.com.au/uploads/publications/BRIEFING\\_New\\_Fed\\_climate\\_change\\_policy.pdf](http://cottonaustralia.com.au/uploads/publications/BRIEFING_New_Fed_climate_change_policy.pdf)>, archived at  
<[https://web.archive.org/web/20190320124831/http://cottonaustralia.com.au/uploads/publications/BRIEFING\\_New\\_Fed\\_climate\\_change\\_policy.pdf](https://web.archive.org/web/20190320124831/http://cottonaustralia.com.au/uploads/publications/BRIEFING_New_Fed_climate_change_policy.pdf)>.

can be categorised as either 'emissions avoidance projects'<sup>174</sup> or 'sequestration offset projects'.<sup>175 176</sup>

The ERF has received substantial criticism from the time it was launched. One major criticism is that the ERF is unlikely to achieve its emissions reduction target with the current funding.<sup>177</sup> The scheme was also criticised for lacking transparency and not being designed to meet Australia's emissions reduction target.<sup>178</sup> This scheme had already managed to secure 191.7 million tonnes of emissions reduction which cost AUD\$2.28 billion.<sup>179</sup> However, only 16% out of the 191.7 million tonnes have been delivered so far.<sup>180</sup> This shows that this system takes time to develop and leaves uncertainty as to whether it can achieve its emissions reduction target. The CPM and the ETS could be a better option.

The DAP also has been criticised for being 'inequitable, inefficient, and unlikely to lower emissions at a pace that is sufficient to meet the conditions of the global climate change agreement' (the PA).<sup>181</sup> It has been critiqued for being 'fundamentally flawed', because these mitigation policies ignore the 'polluter pays' principle, and subsidises the polluters.<sup>182</sup> Further, the ERF was criticised for allowing businesses that have been operating inefficiently and polluting a lot to tender, which is said to be penalising 'past good behaviour' and rewarding 'bad behaviour'.<sup>183</sup> Further, some authors are of the view that the ERF 'has potential to reduce

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<sup>174</sup> *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth) s 53.

<sup>175</sup> *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth) s 54.

<sup>176</sup> *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth) s 5.

<sup>177</sup> Harry Clarke et al, 'How much abatement will Australia's Emissions Reduction buy?' (CCEP Working Paper 1416, Crawford School of Public Policy, Australian National University, 2014) 12.

<sup>178</sup> T. Flannery, *Lagging Behind: Australia and The Global Response to Climate Change* (Report, 2014) 38 <<https://www.climatecouncil.org.au/uploads/211ea746451b3038edfb70b49aee9b6f.pdf>>.

<sup>179</sup> Ian A. Mackenzie, 'Australia's Emissions Reduction Fund is Almost Empty. It shouldn't be refilled', *The Conversation* (Web Page, 26 February 2018) <<https://theconversation.com/australias-emissions-reduction-fund-is-almost-empty-it-shouldnt-be-refilled-92283>>.

<sup>180</sup> Ian A. Mackenzie, 'Australia's Emissions Reduction Fund is Almost Empty. It shouldn't be refilled', *The Conversation* (Web Page, 26 February 2018) <<https://theconversation.com/australias-emissions-reduction-fund-is-almost-empty-it-shouldnt-be-refilled-92283>>.

<sup>181</sup> John Hewson, 'There's no room for agnostics in the climate change debate', *Business Insider* (Web Page, 31 July 2015) <<https://www.businessinsider.com/theres-no-room-for-agnostics-in-the-climate-change-debate-2015-7?IR=T>>.

<sup>182</sup> Evgeny Guglyuvatyy and Natalie P. Stoianoff, 'Carbon Policy in Australia – A Political History' (2016) *Green Fiscal Reform for a Sustainable Future* 31, 44; Environment and Communications References Committee, Parliament of Australia, *Direct Action: Paying Polluters to Halt Global Warming?* (Report, March 2014) 52 <[https://www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Environment\\_and\\_Communications/Direct\\_Action\\_Plan/Report/index](https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/Direct_Action_Plan/Report/index)>.

<sup>183</sup> John Hawkins, 'The Emissions Reduction Fund: a critique' (Conference Paper, Australia New Zealand Society for Ecological Economics 2013 Conference, 2013) 243, 245.

emissions but its implementation hampers that potential'.<sup>184</sup> McConnell views the ERF as a political success, but a program failure.<sup>185</sup>

Significant advantages of the ERF beneficial for businesses include lower electricity bills, protection of international competitiveness, simplicity in the operation of the scheme, and achieving some level of emissions reductions.<sup>186</sup> Further, the ACCUs earned are personal property that are registered. This gives businesses a sense of certainty and credibility towards the system.<sup>187</sup>

The main disadvantages of the ERF include policy uncertainty; lack of clarity; a requirement that the Government raises the tax revenue to pay the polluters; polluters receive the benefits at taxpayers' expense; no incentives given to the consumers and firms for unsuccessful tenders; less encouragement given to develop RE; and no incentives provided for long term measures.<sup>188</sup> Some suggestions have been provided by the CCA to deal with these drawbacks, which includes a requirement to have experts evaluate the projects that are submitted, tighter restrictions with regard to the clearing of land, and projects that involve revegetation receiving funding.<sup>189</sup>

There is significant doubt as to whether the ERF will ensure that Australia can meet its emissions reduction target. Gunningham and Bowman argue that it is unlikely that the ERF

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<sup>184</sup> Tim Baxter and George Gilligan, 'Verification and Australia's Emissions Reduction Fund: Integrity Undermined Through the Landfill Gas Method?' (2017) *Australian Journal of Environmental Law* 1, 2.

<sup>185</sup> Allan McConnell, 'What is Policy Failure? A Primer to Help Navigate the Maze' (2015) 30(3-4) *Public Policy and Administration* 221.

<sup>186</sup> Gordon Weiss and Peter Holt, 'Abbott's Emissions Reduction Fund: What the Experts Say', *Renew Economy* (Web Page, 19 December 2013) <<https://reneweconomy.com.au/abbotts-emissions-reduction-fund-what-the-experts-say-65465/>>; Department of the Environment and Energy, Parliament of Australia, *The Emissions Reduction Fund – what it means for you* (Report, 2019) 3 <<https://www.environment.gov.au/system/files/resources/20e963a0-0226-4131-9b88-ff0c754edea1/files/erf-what-it-means-you.pdf>>.

<sup>187</sup> Australian Government, Parliament of Australia, *Emissions Reduction Fund White Paper* (Report 2014) 11 <<http://www.environment.gov.au/system/files/resources/1f98a924-5946-404c-9510-d440304280f1/files/erf-white-paper.pdf>>.

<sup>188</sup> Jayanthi Kumarasiri and Nava Subramaniam, 'Australia's biggest emitters opt to 'wait and see' over Emissions Reduction Fund', *The Conversation* (Web Page, 15 May 2017) <<https://theconversation.com/australias-biggest-emitters-opt-to-wait-and-see-over-emissions-reduction-fund-77160>>; John Hawkins, 'The Emissions Reduction Fund: a critique' (Conference Paper, Australia New Zealand Society for Ecological Economics 2013 Conference, Canberra) 245-246.

<sup>189</sup> Clive Hamilton and David Karoly, 'The Climate Change Authority's Special Review On Australia's Climate Goals and Policies: Towards A Climate Policy Toolkit', *Climate Council* (Web Page, 5 September 2016) 12-13 <<http://www.climatecouncil.org.au/uploads/e11e0f33fae92ca7cc3239b91e0eb2ab.pdf>>.

will deliver what it has promised.<sup>190</sup> Christoff asserts that ‘Australia won’t meet, let alone exceed, even its very weak 5% reduction target’.<sup>191</sup> In addition, Christoff argues that the ERF is ‘incapable of driving a national transition to renewable energy or encouraging substantial emissions-reducing activities by major industrial emitters’.<sup>192</sup>

According to Crowley in 2017, the ‘Abbott government’s DA/ERF is Australia’s principle emissions reduction measure, even though it is unlikely to cut carbon pollution even by modest levels.’<sup>193</sup> As of October 2018, there was only AUD\$250 million in the ERF according to the environment minister, Melissa Price.<sup>194</sup> The question that arose was whether the AUD\$2.55 billion in the ERF was adequate to buy the abatement that was required by 2020.<sup>195</sup> To overcome this, the Government could allocate additional future funding to the ERF so that there would be continuity of this system until the transition process.<sup>196</sup>

In February 2019, the Morrison Government introduced the Climate Solutions Package (CSP), an AUD\$3.5 billion package aiming to meet Australia’s 2030 climate commitments.<sup>197</sup> According to the Government, the package: allocates AUD\$2 billion towards the existing ERF renamed as the ‘Climate Solutions Fund’; supports the transition to renewables; develops a National Electric Vehicle Strategy; helps households and business to improve energy efficiency; and supports the local communities by the green and clean local environments.<sup>198</sup> The CSP has been criticised by scientists as being unable to achieve the *PA* targets.<sup>199</sup> This new policy proposal appears to take minimal efforts in transiting from coal-powered fired stations and gas towards RE.

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<sup>190</sup> Neil Gunningham, Megan Bowman, ‘Energy regulation for a low carbon economy: Obstacles and opportunities’ (2016) 33 *Environmental and Planning Law Journal* 118, 123.

<sup>191</sup> Peter Christoff, ‘On These Numbers, Australia’s Emissions Auction Won’t Get the Job Done’, *The Conversation* (Web Page, 27 April 2015) <<https://theconversation.com/on-these-numbers-australias-emissions-auction-wont-get-the-job-done-40761>>.

<sup>192</sup> Peter Christoff, ‘On These Numbers, Australia’s Emissions Auction Won’t Get the Job Done’, *The Conversation* (Web Page, 27 April 2015) <<https://theconversation.com/on-these-numbers-australias-emissions-auction-wont-get-the-job-done-40761>>.

<sup>193</sup> Kate Crowley, ‘Up and down with climate politics 2013-2016: the repeal of carbon pricing in Australia’ (2017) 8 *WIREs Climate Change* 1, 7.

<sup>194</sup> Adam Morton, ‘In A Canter? Climate Experts Say Australia Will Not Meet Emissions Targets’, *The Guardian* (online, 11 October 2018) <<https://www.theguardian.com/australia-news/2018/oct/11/in-a-canter-climate-experts-say-australia-will-not-meet-emissions-targets>>. This is the latest available figure.

<sup>195</sup> D. Nong and M. Siriwardana, ‘Australia’s Emissions Reduction Fund in an International Context’ (2017) 54 *Economic Analysis and Policy* 123, 124.

<sup>196</sup> Carbon Market Institute, *Response to Discussion Paper 2017 Review of Climate Change Policies* (Carbon Market Institute, May 2017) 11.

<sup>197</sup> Department of the Environment and Energy, *Climate Solutions Package* (Web Page) <<https://www.environment.gov.au/climate-change/climate-solutions-package>>.

<sup>198</sup> Australian Government, *Climate Solutions Package* (Commonwealth of Australia, 2018) 1.

<sup>199</sup> Bianca Nogrady, *Scientists criticize Australia’s ‘questionable’ climate policy* (Web Page) <<https://www.nature.com/articles/d41586-019-00725-6>>.

In my view, the DAP lacks clarity and relies heavily on federal funding which makes it less likely to achieve the *PA* targets. In comparison, the CPM is a more efficient and effective means of transiting towards a low-carbon economy.<sup>200</sup> However, the Morrison Government is persisting with the DAP by allocating more funding to the CSP. There must be a shift in governmental policies and legislation to move towards a low-carbon economy. A question that arises is whether the Safeguard Mechanism could be the answer to the ERF criticism?

### 3.2.2 Safeguard Mechanism

The SM came into effect in July 2016 during Malcolm Turnbull's term as Prime Minister.<sup>201</sup> The SM was established as part of the ERF to ensure no excessive emissions growth in other parts of the economy as the Government paid for projects to reduce emissions.<sup>202</sup> The aim of the SM is to protect taxpayers' funds spent through the ERF by preventing big business projects that greatly increase GHGe.<sup>203</sup> The SM is supposed to 'prevent emissions increasing above business-as-usual levels', rather than to achieve reductions in GHGe.<sup>204</sup>

The CER administers the SM. The legislative framework for the SM is found in the *NGER Act 2007 (Cth)*<sup>205</sup> and the *Carbon Farming Initiative Amendment Act 2014 (Cth)*, (including the *National Greenhouse and Energy Reporting Regulations 2008 (Cth)*, *National Greenhouse and Energy Reporting (Audit) Determination 2009 (Cth)* and the *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015 (Cth)*) which also supports the SM.

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<sup>200</sup> Neil Gunningham, Megan Bowman, 'Energy regulation for a low carbon economy: Obstacles and opportunities' (2016) 33 *Environmental and Planning Law Journal* 118, 124.

<sup>201</sup> *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015 (Cth)* r 2; Australian Government, *The Safeguard Mechanism – Overview* (Web Page) 1 <<http://www.environment.gov.au/system/files/resources/8fb34942-eb71-420a-b87a-3221c40b2d21/files/factsheet-safeguard-mechanism.pdf>>.

<sup>202</sup> Brett Jannisen, 'Relative Cost and Performance of Australia's Emissions Reduction Fund (ERF)' (MetaEco Working Paper 16-01, Meta Economics Consulting Group, 2016) 3 <[http://www.metaeconconsult.com.au/meta\\_economics/Home\\_files/WP16-01%20ERF%20modelling%2022Feb%20FINAL\\_2.pdf](http://www.metaeconconsult.com.au/meta_economics/Home_files/WP16-01%20ERF%20modelling%2022Feb%20FINAL_2.pdf)>.

<sup>203</sup> Kate Crowley, 'Up and down with climate politics 2013-2016: the repeal of carbon pricing in Australia' (2017) 8 *WIREs Climate Change* 1, 5; Clayton UTZ, *Safeguarding Emissions Reductions* (Web Page) <<https://www.claytonutz.com/knowledge/2016/april/safeguarding-emissions-reductions>>.

<sup>204</sup> Tony Wood and David Blowers, 'Climate phoenix, A sustainable Australian climate policy', *Grattan Institute* (Web Page, April 2016) 8 <<https://grattan.edu.au/wp-content/uploads/2016/04/870-Climate-Phoenix.pdf>>.

<sup>205</sup> The *National Greenhouse and Energy Reporting Act 2007 (Cth)* was amended in 2016 to include the Emissions Reduction Safeguard Mechanism which can be found in Part 3H of the Act.

The SM sets baselines for large businesses that emit the highest amounts of greenhouse gases in Australia;<sup>206</sup> namely, facilities directly emitting (scope 1 emissions) more than 100,000 tonnes of CO<sub>2</sub>-e per year.<sup>207</sup> The SM for the existing facilities works by setting a baseline taken from the highest level of emissions reported over the period of five years.<sup>208</sup> The data is taken from the NGER Scheme. For new facilities, the baseline is set based on forecast and industry benchmarks.<sup>209</sup> For landfill emissions, they are covered under the SM after 1 July 2016.<sup>210</sup>

The baselines are set for individual entities, except the electricity sector, which has a sector-wide baseline.<sup>211</sup> Facilities that generate electricity will be held responsible for their emissions directly emitted into the air.<sup>212</sup> This will not affect the electricity users. The electricity sector has a sector-wide baseline which is 198 million tonnes of CO<sub>2</sub>-e.<sup>213</sup> In this system, there is no baseline set individually.

The SM covered emitters are to report about their emissions to the CER. If the facility exceeds its baseline, it will face civil penalties.<sup>214</sup> In this situation, to avoid civil penalties, the facility must surrender carbon credits to the CER in order to reduce the 'net emissions number' and cover the emissions that have exceeded the baseline.<sup>215</sup>

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<sup>206</sup> Tony Wood and David Blowers, 'Climate phoenix, A sustainable Australian climate policy', *Grattan Institute* (Web Page, April 2016) 8 <<https://grattan.edu.au/wp-content/uploads/2016/04/870-Climate-Phoenix.pdf>>.

<sup>207</sup> *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015* (Cth) r 7, 8, 10 and 12.

<sup>208</sup> *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015* (Cth) r 31; Australian Government, 'The Safeguard Mechanism – Overview' (Web Page) 2 <<http://www.environment.gov.au/system/files/resources/8fb34942-eb71-420a-b87a-3221c40b2d21/files/factsheet-safeguard-mechanism.pdf>>.

<sup>209</sup> *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015* (Cth) r 33; Australian Government, *The Safeguard Mechanism – Overview* (Web Page) 2 <<http://www.environment.gov.au/system/files/resources/8fb34942-eb71-420a-b87a-3221c40b2d21/files/factsheet-safeguard-mechanism.pdf>>.

<sup>210</sup> *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015* (Cth) r 52.

<sup>211</sup> *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015* (Cth) r 4; Tony Wood and David Blowers, 'Climate phoenix, A sustainable Australian climate policy', *Grattan Institute* (Web Page, April 2016) 17 <<https://grattan.edu.au/wp-content/uploads/2016/04/870-Climate-Phoenix.pdf>>.

<sup>212</sup> Australian Government, *The Safeguard Mechanism – Overview* (Web Page) 2 <<http://www.environment.gov.au/system/files/resources/8fb34942-eb71-420a-b87a-3221c40b2d21/files/factsheet-safeguard-mechanism.pdf>>.

<sup>213</sup> Tony Wood and David Blowers, 'Climate phoenix, A sustainable Australian climate policy', *Grattan Institute* (Web Page, April 2016) 23 <<https://grattan.edu.au/wp-content/uploads/2016/04/870-Climate-Phoenix.pdf>>.

<sup>214</sup> *National Greenhouse and Energy Reporting Act 2007* (Cth) s 22XF.

<sup>215</sup> *National Greenhouse and Energy Reporting Act 2007* (Cth) s 22XK.

Facilities that emit below their baseline earn no credits.<sup>216</sup> As Wood and Blowers argue, if the facility emits below the baseline, no credits are created by reducing emissions and the SM works something like a ‘one-sided absolute baseline scheme’.<sup>217</sup> This is because entities that emit above the baseline face penalties, but entities which emit below the baseline do not receive any credits for emitting below its baseline (i.e. no incentive is given for a facility to reduce emissions below its baseline).<sup>218</sup> Further, entities that emit above the baseline are allowed to purchase ACCUs which are generated from the ERF, to cure the difference between the level emitted and the baseline level.<sup>219</sup> The ACCUs may also be earned by projects conducted on SM facilities, either by the facility owner or another person – if by another person, the ACCUs earned are not credited to the facilities net emissions number.<sup>220</sup> There has recently been a recommendation to develop a crediting mechanism to incentivize investments in reducing emissions below the baseline.<sup>221</sup>

Facilities can apply under *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015* (Cth) (*NGER SM Rules 2015*) r 46 to adjust the production baseline (that is raise their baselines). The production-adjusted baseline is determined based on actual production levels.<sup>222</sup> If production increases, the facility does not have to offset the increasing emissions, provided the facility’s emissions intensity<sup>223</sup> improves. The production-adjusted baseline is set by multiplying the actual production from a period by an emissions intensity value.<sup>224</sup>

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<sup>216</sup> *National Greenhouse and Energy Reporting Act 2007* (Cth) Part 3H, especially s 22XK(4).

<sup>217</sup> Tony Wood and David Blowers, ‘Climate phoenix, A sustainable Australian climate policy’, *Grattan Institute* (Web Page, April 2016) 16 <<https://grattan.edu.au/wp-content/uploads/2016/04/870-Climate-Phoenix.pdf>>.

<sup>218</sup> Tony Wood and David Blowers, ‘Climate phoenix, A sustainable Australian climate policy’, *Grattan Institute* (Web Page, April 2016) 16 <<https://grattan.edu.au/wp-content/uploads/2016/04/870-Climate-Phoenix.pdf>>.

<sup>219</sup> Tony Wood and David Blowers, ‘Climate phoenix, A sustainable Australian climate policy’, *Grattan Institute* (Web Page, April 2016) 16 <<https://grattan.edu.au/wp-content/uploads/2016/04/870-Climate-Phoenix.pdf>>.

<sup>220</sup> *National Greenhouse and Energy Reporting Act 2007* (Cth) s 22XK(4).

<sup>221</sup> Australian Government, Department of Industry, Science, Energy and Resources, Parliament of Australia, *Report of the Expert Panel examining additional sources of low cost abatement* (Report, 14 February 2020) 72 <<https://www.industry.gov.au/sites/default/files/2020-05/expert-panel-report-examining-additional-sources-of-low-cost-abatement.pdf>>.

<sup>222</sup> Australian Government Clean Energy Regulator, *Baselines* (Web Page) <<http://www.cleanenergyregulator.gov.au/NGER/The-safeguard-mechanism/Baselines>>.

<sup>223</sup> The emissions intensity is stated in *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015* (Cth) r 47.

<sup>224</sup> Australian Government Clean Energy Regulator, *Production-Adjusted Baseline* (Web Page) <<http://www.cleanenergyregulator.gov.au/NGER/The-safeguard-mechanism/Baselines/Production-adjusted-baseline>>.

In March 2019, the *National Greenhouse and Energy Reporting (Safeguard Mechanism) Amendment Rule (No. 1) 2019* (Cth) was released.<sup>225</sup> These amended rules make it easier for polluters to pollute more.<sup>226</sup> Companies can apply to increase their baseline if their production levels were expected to rise or if they have just started operating. Companies can apply for a higher pollution limit called the ‘calculated baseline’.

There are a number of problems with the SM. First, the mechanism makes it cheaper for the entities to ‘aim for emissions above their baselines and store up credits for the difference’, which can be done by generating the credits from the ERF, or buying domestic offsets from the ERF.<sup>227</sup> Second, in order for the mechanism to work efficiently, there needs to be a ‘cohort of bureaucrats’ which gathers data continuously and monitors compliance with the system.<sup>228</sup>

Despite the problems in the SM, it has some operational advantages. The most prominent advantages include protecting the ERF against unexpected emissions growth, flexibility, penalties for exceeding baseline, and incentives provided to undertake ERF projects.<sup>229</sup> The SM also has significant disadvantages such as lack of clarity; application to the largest emitters only; a baseline level set too high which targets only large emitters; difficulty in setting a baseline for new facilities; coverage of the scheme; uncertainty in achieving Australia’s emissions reduction target; rising compliance costs; no access to international credit units; new emitters are included without reference to any national cap; and other disadvantages.<sup>230</sup>

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<sup>225</sup> This legislation is no longer in force.

<sup>226</sup> K. Murphy and L. Cox, ‘Emissions Safeguard Switch Will Relax Controls On Big Polluters, Greens Say’, *The Guardian* (online, 8 March 2019 <<https://www.theguardian.com/australia-news/2019/mar/08/emissions-safeguard-switch-big-polluters-greens>>).

<sup>227</sup> Clive Hamilton and David Karoly, ‘The Climate Change Authority’s Special Review On Australia’s Climate Goals and Policies: Towards A Climate Policy Toolkit’, *Climate Council* (Web Page, 5 September 2016) 11-12 <<http://www.climatecouncil.org.au/uploads/e11e0f33fae92ca7cc3239b91e0eb2ab.pdf>>.

<sup>228</sup> Clive Hamilton and David Karoly, ‘The Climate Change Authority’s Special Review On Australia’s Climate Goals and Policies: Towards A Climate Policy Toolkit’, *Climate Council* (Web Page, 5 September 2016) 11-12 <<http://www.climatecouncil.org.au/uploads/e11e0f33fae92ca7cc3239b91e0eb2ab.pdf>>.

<sup>229</sup> Gordon Weiss, ‘Its time to get serious about the Safeguard Mechanism’, *Energetics* (Web Page, October 2017) <<https://www.energetics.com.au/insights/thought-leadership/it-s-time-to-get-serious-about-the-safeguard-mechanism>>; Australian Government, ‘Emissions Reduction Fund Safeguard Mechanism Regulation Impact Statement’ (Web Page) 37 <<https://ris.pmc.gov.au/sites/default/files/posts/2016/01/Safeguard-mechanism-for-the-Emissions-Reduction-Fund-RIS.pdf>>.

<sup>230</sup> Australian Government, ‘Emissions Reduction Fund Safeguard Mechanism Regulation Impact Statement’ (Web Page) 38 <<https://ris.pmc.gov.au/sites/default/files/posts/2016/01/Safeguard-mechanism-for-the-Emissions-Reduction-Fund-RIS.pdf>>.



The SM is criticised as weak.<sup>231</sup> According to the Grattan Institute report, the SM 'leaves half of Australia's emissions unrestricted'.<sup>232</sup> Further, the SM is argued to be uncertain in terms of achieving Australia's emissions reduction targets.<sup>233</sup> According to Peter Castellanos, Chief Executive Officer of the Carbon Market Institute, the SM is 'unlikely to make a significant contribution to reducing emissions below business as usual levels'.<sup>234</sup>

The emissions threshold set by the SM was to cover a large proportion of Australia's emissions. However, the existing threshold only affects a small number of facilities in Australia. The threshold of emissions above 100,000 tonnes of CO<sub>2</sub> equivalent is too high and fewer facilities would fall under this bracket. As such, it would be more effective to reduce the emissions threshold to 50,000 tonnes of CO<sub>2</sub> equivalent to cover more facilities. This would increase the number of companies being subjected to the safeguard compliance obligations.

When the CPM was in practice, GHGe dropped significantly.<sup>235</sup> However, after repealing the clean energy package legislation, the level of GHGe has been on the rise.<sup>236</sup> Therefore, it would be practical to have a limit or 'cap' on the overall emissions to prevent polluters from emitting beyond the specified limits.<sup>237</sup>

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<sup>231</sup> Emily Hanna, Science, 'Climate Change – reducing Australia's emissions', *Parliament of Australia* (Web Page)

<<https://parlinfo.aph.gov.au/parlInfo/search/display/display.w3p;query=Id%3A%22library%2Fprspub%2F4789160%22>>.

<sup>232</sup> Tony Wood and David Blowers, 'Climate phoenix, A sustainable Australian climate policy', *Grattan Institute* (Web Page, April 2016) 17 <<https://grattan.edu.au/wp-content/uploads/2016/04/870-Climite-Phoenix.pdf>>.

<sup>233</sup> Brendan Bateman and Alison Packham, 'Safeguarding emissions reduction', *Clayton UTZ* (Web Page, 28 April 2016) <<https://www.claytonutz.com/knowledge/2016/april/safeguarding-emissions-reductions>>.

<sup>234</sup> Carbon Market Institute, 'The ERF & Safeguard Mechanism must evolve to be an effective market based approach to emissions reduction' (Web Page) <<http://carbonmarketinstitute.org/wp-content/uploads/2017/10/Media-Release-The-ERF-Safeguard-Mechanism-Must-Evolve-to-be-an-Effective-Market-based-Approach-to-Emissions-Reduction.pdf>>.

<sup>235</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2017* (Report, 18 May 2018) 5 <<https://www.environment.gov.au/system/files/resources/7b9824b8-49cc-4c96-b5d6-f03911e9a01d/files/nggi-quarterly-update-dec-2017-revised.pdf>>.

<sup>236</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2017* (Report, 18 May 2018) 5 <<https://www.environment.gov.au/system/files/resources/7b9824b8-49cc-4c96-b5d6-f03911e9a01d/files/nggi-quarterly-update-dec-2017-revised.pdf>>.

<sup>237</sup> Evgeny Guglyuvatyy and Natalie P. Stoianoff, 'Carbon Policy in Australia – A Political History' (2016) *Green Fiscal Reform for a Sustainable Future* 31, 43; E de Wit and A. Quinton, 'Creating, Buying and Safeguarding Emissions Reductions under the Emissions Reduction Fund' (2018) 92 *Australian Law Journal* 766-773.

Questions have been raised by experts in this area as to the effectiveness of the current measures in place to reduce GHGe.<sup>238</sup> Currently, the only mechanism available is the SM which sets a baseline. Gunningham and Bowman argue that the ERF with the SM is 'untenable'.<sup>239</sup> The objective of the SM should be clearly stated by the Government: to be effective and contribute towards Australia's emissions reduction target.<sup>240</sup>

Australia does not have a 'cap' on emissions to ensure that polluters limit GHGe.<sup>241</sup> The SM explicitly allows for increasing emissions.<sup>242</sup> Facilities can apply to raise their baselines which means emitting more. Currently, there is no limit on Australia's emissions. The question that arises is whether the ERF and SM are better mitigation policies to address the issue of climate change compared to the ETS and the CPM. As Australia has ratified the PA, it could be argued that its international obligations have become increasingly stringent.<sup>243</sup>

### *3.3 Renewable Energy Target*

This target is a separate mechanism focusing on RE. There are national, and State RE targets which are explained in Chapter 5.

### *3.4 National Energy Productivity Plan*

This Plan was introduced in December 2015 by the Council of Australian Governments (COAG) to 'ensure energy productivity improves by 40 per cent over the period 2015 to 2030'.<sup>244</sup> It includes energy productivity measures such as energy efficiency standards for

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<sup>238</sup> Ken Chan, 'Don't forget the weather in the axing of the carbon tax in Australia' (2015) 6 (1-2) *Carbon Management* 63, 64.

<sup>239</sup> Neil Gunningham, Megan Bowman, 'Energy regulation for a low carbon economy: Obstacles and opportunities' (2016) 33 *Environmental and Planning Law Journal* 118, 124.

<sup>240</sup> Carbon Market Institute, *2017 Australian Climate Policy Review Submission* (Report, May 2017) 17 <<http://marketplace.carbonmarketinstitute.org/wp-content/uploads/2018/10/CMI-Submission-2017-Australian-Climate-Change-Policy-Review.pdf>>.

<sup>241</sup> Evgeny Guglyuvatyy and Natalie P. Stoianoff, 'Carbon Policy in Australia – A Political History' (2016) *Green Fiscal Reform for a Sustainable Future* 31, 43.

<sup>242</sup> K. Murphy and L. Cox, 'Emissions Safeguard Switch Will Relax Controls On Big Polluters, Greens Say', *The Guardian* (online, 8 March 2019) <<https://www.theguardian.com/australia-news/2019/mar/08/emissions-safeguard-switch-big-polluters-greens>>; A. Morton, 'Coalition's Climate Policy Has Allowed Heavy Industry To Increase Emissions By Nearly A Third', *The Guardian* (online, 16 May 2019) <<https://www.theguardian.com/environment/2019/may/16/coalition-climate-policy-heavy-industry-increase-emissions-nearly-third>>.

<sup>243</sup> Carbon Market Institute, *2017 Australian Climate Policy Review Submission* (Report, May 2017) 17 <<http://marketplace.carbonmarketinstitute.org/wp-content/uploads/2018/10/CMI-Submission-2017-Australian-Climate-Change-Policy-Review.pdf>>.

<sup>244</sup> Department of the Environment and Energy, Parliament of Australia, *2017 Review of Climate Change Policies* (Report, December 2017) 6

products and vehicle efficiency standards.<sup>245</sup> The NEPP also contributes to Australia's PA commitment.<sup>246</sup>

According to the COAG Energy Council, the NEPP helps businesses to reduce energy costs; households to enjoy lower energy bills; and Australia to reduce GHGe.<sup>247</sup> If the NEPP works well, it will benefit Australia through reduced cost of electricity. However, in his report, Alan Pears stated that 'aside from ACT, all Australian States and territories are far behind on energy efficiency efforts'.<sup>248</sup>

This plan has been described as heading towards the road of failure.<sup>249</sup> It is complex, and lacks funding and commitment. Even the National Energy Guarantee (NEG) has been abandoned, which is explained in section 3.5. The complexity and lack of funding clearly show that there is insufficient legislation and policy to ensure energy efficiency. The lack of proper leadership to pursue the plan properly, clearly indicates the lack of commitment towards it.

### *3.5 National Energy Guarantee - Abandoned*

The National Energy Guarantee (NEG) was a scheme to be introduced in 2020.<sup>250</sup> This scheme aimed to provide reliability, affordability and sustainability for the National Energy Market<sup>251</sup> and proposed to provide an affordable, reliable energy system to help Australia to

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<<https://www.environment.gov.au/system/files/resources/18690271-59ac-43c8-ae1-92d930141f54/files/2017-review-of-climate-change-policies.pdf>>.

<sup>245</sup> Department of the Environment and Energy, Parliament of Australia, *2017 Review of Climate Change Policies* (Report, December 2017) 6

<<https://www.environment.gov.au/system/files/resources/18690271-59ac-43c8-ae1-92d930141f54/files/2017-review-of-climate-change-policies.pdf>>.

<sup>246</sup> International Energy Agency, 'Energy Policies of IEA Countries: Australia 2018 Review' (Web Page, 2018) 215 <<https://www.connaissancedesenergies.org/sites/default/files/pdf-actualites/australia2018.pdf>>.

<sup>247</sup> Council of Australian Governments Energy Council, *National Energy Productivity Plan Annual Report 2017* (Report, 2017) 5

<<http://www.coagenergycouncil.gov.au/sites/prod.energycouncil/files/publications/documents/NEPP%20Annual%20Report%202017-web.pdf>>; Department of the Environment and Energy, *National Energy Productivity Plan* (Web Page) <<https://www.energy.gov.au/government-priorities/energy-productivity-and-energy-efficiency/national-energy-productivity-plan>>.

<sup>248</sup> The Fifth Estate, *Alan Pears: Australia's Missing The Boat on Energy Efficiency* (Web Page) <<https://www.thefifthestate.com.au/business/government/alan-pears-australias-missing-the-boat-on-energy-efficiency/>>. ACT means Australia Capital Territory.

<sup>249</sup> Alan Pears, 'Australia's Energy Productivity Plan Promises More Bang For Our Buck, but Lacks Commitment', *The Conversation* (online, 29 January 2016) <<https://theconversation.com/australias-energy-productivity-plan-promises-more-bang-for-our-buck-but-lacks-commitment-53734>>.

<sup>250</sup> United Nations Association of Australia, *Managing Climate Change In Australia A Global, Long-Term View Discussion Paper July 2018* (Report, July 2018) 27 <[https://www.unaa.org.au/wp-content/uploads/2018/07/UNAA\\_ClimateChangeDiscussionPaper.pdf](https://www.unaa.org.au/wp-content/uploads/2018/07/UNAA_ClimateChangeDiscussionPaper.pdf)>.

<sup>251</sup> Council of Australian Governments Energy Council, *National Energy Guarantee: Draft Design Consultation Paper* (Consultation Paper Report, 15 February 2018) 5

reduce its emissions. Despite enormous efforts to draft the NEG by the Turnbull Government, the Morrison Government rejected the NEG and finally abandoned it in September 2018.<sup>252</sup> The abandonment clearly shows the lack of national Government policy to reduce GHGe.

Under the NEG, retailers would need to sign contracts to supply a minimum amount of energy to be available at all times. The energy sold had to meet Australia's emissions reduction targets in the *PA*.<sup>253</sup> The NEG has two main criteria; namely, the reliability and emissions requirement. The reliability requirement ensures that the right level of energy is dispatched during peak periods in regions with tight supply or large volumes of renewables,<sup>254</sup> while the emissions requirement ensures that the emissions level is consistent with the *PA* targets.<sup>255</sup>

The Commonwealth Government is responsible for Australia meeting its *PA* targets by implementing the elements of the NEG through Commonwealth legislation. Reporting of emissions would be administered by the CER under the *NGER Act 2007*. The NEG was intended to replace the RET.<sup>256</sup> However, this did not take place. The problem with the NEG is that it would only apply to the National Energy Market excluding Western Australia (WA) and the Northern Territory.<sup>257</sup>

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<[http://www.coagenergycouncil.gov.au/sites/prod.energycouncil/files/publications/documents/Energy%20Security%20Board%20National%20Energy%20Guarantee%20-Consultation%20Paper\\_0.pdf](http://www.coagenergycouncil.gov.au/sites/prod.energycouncil/files/publications/documents/Energy%20Security%20Board%20National%20Energy%20Guarantee%20-Consultation%20Paper_0.pdf)>.

<sup>252</sup> Guardian staff, 'Scott Morrison Says National Energy Guarantee 'Is Dead'', *The Guardian* (online, 8 September 2018) <<https://www.theguardian.com/australia-news/2018/sep/08/scott-morrison-says-national-energy-guarantee-is-dead>>.

<sup>253</sup> Charis Chang, *What is the National Energy Guarantee and will it reduce power prices?* (Web Page) <<https://www.news.com.au/technology/environment/climate-change/what-is-the-national-energy-guarantee-and-will-it-reduce-power-prices/news-story/252c6aea07a501bd1d206f2056321a76>>.

<sup>254</sup> Department of the Environment and Energy, Parliament of Australia, *National Energy Guarantee July 2018*, (Report, July 2018) 4 <<http://coagenergycouncil.gov.au/sites/prod.energycouncil/files/publications/documents/National%20Energy%20Guarantee%20-%20Final%20Detailed%20Design%20Commonwealth%20Elements.pdf>>.

<sup>255</sup> Department of the Environment and Energy, Parliament of Australia, *National Energy Guarantee July 2018*, (Report, July 2018) 4 <<http://coagenergycouncil.gov.au/sites/prod.energycouncil/files/publications/documents/National%20Energy%20Guarantee%20-%20Final%20Detailed%20Design%20Commonwealth%20Elements.pdf>>.

<sup>256</sup> Energy Security Board, *National Energy Guarantee Questions and Answers* (Web Page) 2 <<http://www.coagenergycouncil.gov.au/sites/prod.energycouncil/files/publications/documents/National%20Energy%20Guarantee%20Questions%20-%20Answers.pdf>>.

<sup>257</sup> Madeleine De Gabriele, Michael Hopkin and Wes Mountain, 'Infographic: The National Energy Guarantee at a Glance', *The Conversation* (Web Page, 17 October 2017) <<https://theconversation.com/infographic-the-national-energy-guarantee-at-a-glance-85832>>.

The NEG did not receive much support as it lacked clarity. Instead, it was criticised by renewable energy advocates who stated that ‘the climate targets are weak and actually attempting to put a handbrake on change’.<sup>258</sup> The Climate Council’s view was that the NEG is unlikely to reduce pollution in Australia with the Government’s RE figures in 2030;<sup>259</sup> this is because there is higher reliance on coal and gas. The NEG was abandoned in September 2018, showing the difficulty Australia faces in having effective GHGe legislation and policies.

## 4.0 Environmental Impact Assessment

### 4.1 Commonwealth Environmental Impact Assessment on Greenhouse Gas Emissions

The *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (*EPBC 1999*) is the centrepiece of Australia’s environmental legislation at the federal level. Objectives of the *EPBC 1999* are set out in s 3. Particular attention is drawn to *EPBC 1999* s 3(1)(a) which ‘provide[s] for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance’. As a result, the *EPBC 1999* requires an assessment and approval of an action that ‘has, will have or is likely to have a significant impact’<sup>260</sup> on ‘matters of national environmental significance’.<sup>261</sup> The absence of a ‘climate trigger’<sup>262</sup> in the Act leaves advocates for better regulation of GHGe having to argue the impact of climate change harm from specific proposed actions on ‘matters of national environmental significance’, which is difficult to demonstrate. Advocates for a ‘climate trigger’ suggest that it can reduce Australia’s GHGe profile and regulating tree clearing and projects with large emission profiles. The “Interim Report of the Independent Review of the EBPC Act (2020)” did not support the introduction of a climate trigger because successive Australian Governments had chosen to apply specific policy mechanisms for GHGe regulation, though it did see merit in mandating that proposals requiring assessment approval should transparently disclose their full emissions profile.<sup>263</sup>

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<sup>258</sup> Ben Courtice, ‘Renewables Advocates Slam National Energy Guarantee’, *Green Left* (Web Page, 24 May 2018) <<https://www.greenleft.org.au/content/renewables-advocates-slam-national-energy-guarantee>>.

<sup>259</sup> Climate Council, ‘National Energy Guarantee: Factsheet & Media Briefing Paper’ (Web Page) 2 <<https://www.climatecouncil.org.au/wp-content/uploads/2017/10/NEG-Factsheet-and-Media-Briefing-Paper.pdf>>.

<sup>260</sup> *Environment Protection and Biodiversity Conservation Act 1999* (Cth) s 11.

<sup>261</sup> *Environment Protection and Biodiversity Conservation Act 1999* (Cth) s 12-25.

<sup>262</sup> Department of Agriculture, Water and the Environment, Parliament of Australia, *Independent Review of the EPBC Act – Interim Report* (Report, June 2020) 23 <<https://epbcactreview.environment.gov.au/resources/interim-report/chapter-1-national-level-protection-and-conservation-environment-and-iconic-places/14-proposed-key-reform-directions>>.

<sup>263</sup> Department of Agriculture, Water and the Environment, Parliament of Australia, *Independent Review of the EPBC Act – Interim Report* (Report, June 2020) 23 <<https://epbcactreview.environment.gov.au/resources/interim-report/chapter-1-national-level-protection-and-conservation-environment-and-iconic-places/14-proposed-key-reform-directions>>.

An environmental impact assessment (EIA) is carried out to examine and evaluate the effects of the proposed activities that are likely to have a significant impact on the environment.<sup>264</sup> The EIA has to be submitted for the Minister's approval.<sup>265</sup> There is no avenue for reviewing the approval of decisions under the *EPBC 1999*, but for judicial review. The *Australian Conservation Foundation Incorporated v Minister for the Environment and Energy*<sup>266</sup> (ACF case) is an example.

In the ACF case, ACF challenged the Minister's approval of Adani's Carmichael coal mine under the *EPBC 1999* on the grounds that the pollution from the coal mines will have a significant impact on the environment. The only way to challenge the Minister's decision was through judicial review. The appeal was dismissed; a federal Court judge found that the Minister made no error in law while approving the coal mine activity under the *EPBC 1999*.

The *EPBC 1999* looks at the whole environment umbrella (i.e overarching legislation). The Act is still developing as certain terms are unclear, leading to different interpretations. The *EPBC 1999* is key legislation at the federal level. As such, clarity is important to reduce misinterpretations.

#### *4.2 Western Australia State Environmental Impact Assessment*

Procedures for environmental impact assessment or similar resource project approval procedures have been used in the past decade in a number of Australian States to assert a legal requirement to consider the impact of GHGe.<sup>267</sup> The scope of these arguments are too broad to consider within the scope of this thesis, so the focus of attention here is on the use of environmental impact assessment law within Western Australia (WA).

In late August 2019, the WA Energy Minister, Bill Johnston, stated that the WA Government would adopt an aspirational target of net zero emissions by 2050.<sup>268</sup> He

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<sup>264</sup> G. Bates, *Environmental Law in Australia* (LexisNexis Butterworths Australia, 10<sup>th</sup> ed, 2019) 300.

<sup>265</sup> *Environment Protection and Biodiversity Conservation Act 1999* (Cth) s 11. Part 9 of the Act explains more on the approval of actions.

<sup>266</sup> *Australian Conservation Foundation Incorporated v Minister for the Environment and Energy* (2016) FCA 1042.

<sup>267</sup> J Bell-James & S Ryan, 'Climate change litigation in Queensland: A case study in incrementalism' (2016) 33 *Environmental and Planning Law Journal* 515; V McGinness & M Raff, 'Coal and Climate Change: A Study of Contemporary Climate Litigation in Australia' (2020) 37 *Environmental Planning Law Journal* 87.

<sup>268</sup> Government of Western Australia, *State Government details emissions policy for major projects* (Web Page, 28 August 2019) <<https://www.mediastatements.wa.gov.au/Pages/McGowan/2019/08/State-Government-details-emissions-policy-for-major-projects.aspx>>.

acknowledged the Federal Government's reduction target (NDC) and stated that WA would commit to work with the Commonwealth to achieve this goal. The WA Government has outlined its GHGe policy for major projects assessed by the Environmental Protection Authority (EPA) and the Government is going to ask for GHGe plans from major projects detailing the proponents' contributions towards achieving the Government's net zero emissions target by 2050. The Government plans to do this by recognising activities that generate carbon offsets and will consider international offsets. However, the WA Government is relatively silent regarding how it will achieve the reductions (how companies will reduce emissions). Broader WA climate policy is being developed and will be released this year.

The EPA WA released a new Guideline on EIA of GHGe in April 2020.<sup>269</sup> The objective of the Guideline is '[t]o reduce net greenhouse gas emissions in order to minimize the risk of environmental harm associated with climate change'.<sup>270</sup> It acknowledges the context of National Government policy and developing State Government policy on reduction of GHGe within the context of the PA goals, including the Intergovernmental Panel on Climate Change's 1.5 Report identifying the emissions reduction task to reach ' "net zero" around 2050, to limit global warming to 1.5 degrees Celsius'.<sup>271</sup> The guidelines set out how EIA in WA can be used to contribute to achieving Australia's PA targets. The guidelines are not binding.<sup>272</sup>

The Guideline applies to new projects and expansions of existing projects with scope 1 GHGe that will exceed 100,000 tonnes per year of CO<sub>2</sub>-e.<sup>273</sup> The EPA WA provides a non-exhaustive list of activities that may be considered which includes the 'extraction, processing, and refining of oil and gas' and the use of fossil fuels for energy production.<sup>274</sup> For a proposal

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<sup>269</sup> Environmental Protection Authority, *Environmental Factor Guideline: Greenhouse Gas Emissions* (Report, April 2020) <[http://www.epa.wa.gov.au/sites/default/files/Policies\\_and\\_Guidance/EFG%20-%20GHG%20Emissions%20-%2016.04.2020.pdf](http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EFG%20-%20GHG%20Emissions%20-%2016.04.2020.pdf)>.

<sup>270</sup> Environmental Protection Authority, *Environmental Factor Guideline: Greenhouse Gas Emissions* (Report, April 2020) 1 <[http://www.epa.wa.gov.au/sites/default/files/Policies\\_and\\_Guidance/EFG%20-%20GHG%20Emissions%20-%2016.04.2020.pdf](http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EFG%20-%20GHG%20Emissions%20-%2016.04.2020.pdf)>.

<sup>271</sup> Environmental Protection Authority, *Environmental Factor Guideline: Greenhouse Gas Emissions* (Report, April 2020) 2 <[http://www.epa.wa.gov.au/sites/default/files/Policies\\_and\\_Guidance/EFG%20-%20GHG%20Emissions%20-%2016.04.2020.pdf](http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EFG%20-%20GHG%20Emissions%20-%2016.04.2020.pdf)>.

<sup>272</sup> Environmental Protection Authority, *Environmental Factor Guideline: Greenhouse Gas Emissions* (Report, April 2020) 2 <[http://www.epa.wa.gov.au/sites/default/files/Policies\\_and\\_Guidance/EFG%20-%20GHG%20Emissions%20-%2016.04.2020.pdf](http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EFG%20-%20GHG%20Emissions%20-%2016.04.2020.pdf)>.

<sup>273</sup> Environmental Protection Authority, *Environmental Factor Guideline: Greenhouse Gas Emissions* (Report, April 2020) 4 <[http://www.epa.wa.gov.au/sites/default/files/Policies\\_and\\_Guidance/EFG%20-%20GHG%20Emissions%20-%2016.04.2020.pdf](http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EFG%20-%20GHG%20Emissions%20-%2016.04.2020.pdf)>.

<sup>274</sup> Environmental Protection Authority, *Environmental Factor Guideline: Greenhouse Gas Emissions* (Report, April 2020) 3

assessable on the GHGe environmental factor, the following are considered: the application of the EPA's mitigation hierarchy which is to 'avoid, reduce, and offset emissions'; the 'interim, and long-term emissions reduction targets the proponent proposes to achieve'; the 'adoption of best practice design, technology and management appropriate to mitigate' GHGe; and 'whether proposed mitigation is plausible, timely, achievable' and is reasonable and practical.<sup>275</sup> Once GHGe have been identified as a 'preliminary key environmental factor', the proponent may be required to provide information as to the estimated emissions, a Greenhouse Gas Management Plan, and measures to 'avoid, reduce, and offset' GHGe to the EPA.<sup>276</sup> Further, it has suggested the use of environmental offsets<sup>277</sup> to reduce GHGe. These guidelines are practical, pointing to the right direction to reduce emissions.

## 5.0 Carbon Capture and Storage/Geosequestration

Australia has been developing a carbon capture and storage (CCS)<sup>278</sup> strategy for more than a decade. In August 2019, it was able to successfully run its first large scale CCS project.<sup>279</sup> The Gorgon project on Barrow Island, North West coast of WA is an example of this. The CCS strategy is still being developed to improve efficiency and reduce cost, making it a viable option in Australia. The development of CCS in Australia is discussed in more detail in Chapter 6.

## 6.0 Evaluating Greenhouse Gas Emissions Reduction Effect of Legislation and Policies

Have Australia's legislation and policies to date reduced GHGe in the fossil fuel industry and economy wide? GHGe were decreasing when the Gillard Government's carbon price was in operation. The principal objectives of the *CEA 2011* were clearly defined and the

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<[http://www.epa.wa.gov.au/sites/default/files/Policies\\_and\\_Guidance/EFG%20-%20GHG%20Emissions%20-%2016.04.2020.pdf](http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EFG%20-%20GHG%20Emissions%20-%2016.04.2020.pdf)>.

<sup>275</sup> Environmental Protection Authority, *Environmental Factor Guideline: Greenhouse Gas Emissions* (Report, April 2020) 4

<[http://www.epa.wa.gov.au/sites/default/files/Policies\\_and\\_Guidance/EFG%20-%20GHG%20Emissions%20-%2016.04.2020.pdf](http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EFG%20-%20GHG%20Emissions%20-%2016.04.2020.pdf)>.

<sup>276</sup> Environmental Protection Authority, *Environmental Factor Guideline: Greenhouse Gas Emissions* (Report, April 2020) 4-5

<[http://www.epa.wa.gov.au/sites/default/files/Policies\\_and\\_Guidance/EFG%20-%20GHG%20Emissions%20-%2016.04.2020.pdf](http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EFG%20-%20GHG%20Emissions%20-%2016.04.2020.pdf)>.

<sup>277</sup> Environmental offsets mean 'actions that provide environmental benefits which counterbalance the significant residual environmental impacts or risks of a project or activity.' Source: Environmental Protection Agency (Western Australia), 'WA Environmental Offsets Guidelines' (Web Page) 3 <[http://www.epa.wa.gov.au/sites/default/files/Policies\\_and\\_Guidance/WA%20Environmental%20Offsets%20Guideline%20August%202014.pdf](http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/WA%20Environmental%20Offsets%20Guideline%20August%202014.pdf)>.

<sup>278</sup> CCS is a form of geo-sequestration and not bio-sequestration. The differences between the two will be explained in Chapter 6.

<sup>279</sup> Chevron, *Gorgon* (Web Page) <<https://www.chevron.com/projects/gorgon>>.



comprehensive legislation was designed to achieve the objectives: to reduce GHGe in Australia. The CPM also fostered investment and innovation in RE. There was proper measurement of emissions, and compliance was monitored by the CER, making the workings of the system more effective. The CPM was a comprehensive package of clean energy legislation that had binding effect on big and medium sized businesses. Importantly, it included legislated measures to cap and reduce Australia's GHGe.

In my view, the CPM was not given sufficient time to demonstrate its effectiveness. Statistics showed that, during the short time when the CPM was in effect, GHGe in Australia dropped significantly, particularly in years 2011 and 2012.<sup>280</sup> Under the Australian CPM, there was a threshold of 25,000 kt/a CO<sub>2</sub>-e for regulating stationary facility emissions and a limit or 'cap' on the number of emission permits that would be issued for those entities. Once the facility emitted above the threshold, it would have to pay for each tonne emitted above the threshold. Emitters were under a permit liability, which required them to acquire and surrender a permit for each tonne of CO<sub>2</sub> they emitted. A carbon tax equivalent pricing mechanism was used for non-stationary emissions, such as from transport.

However, due to lack of political support, the CPM and the associated legislation was repealed. The Abbott Government argued that electricity prices would be lower if there was no 'carbon tax'. The Abbott Government used the words 'carbon tax' to describe all of the pricing mechanisms in the legislation, although the legislation referred only to a 'carbon price'.<sup>281</sup> Abbott won the 2013 election, in part, by misusing the word 'carbon tax'. One of the reasons why the CPM failed to earn popularity was because the Australian community was not well informed on the benefits of having a CPM.

With the current legislation and policies in place, and without a cap on emissions, reducing GHGe is a challenge for the Australian Government. The ERF and SM, which are currently the two main instruments of the Australian Government's mitigation efforts to 2030, have significant problems. According to the Grattan Institute report, the 'policies will need to be strengthened considerably if they are to produce the projected results'.<sup>282</sup>

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<sup>280</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2017* (Report, 18 May 2018) 5.

<sup>281</sup> *Clean Energy Act 2011* (Cth) s 3(d) (repealed) clearly mentioned 'to put a price on greenhouse gas emissions'.

<sup>282</sup> Tony Wood and David Blowers, 'Climate phoenix, A sustainable Australian climate policy', *Grattan Institute* (Web Page, April 2016) 7 <<https://grattan.edu.au/wp-content/uploads/2016/04/870-Climate-Phoenix.pdf>>.

Further, the ERF is a voluntary scheme and pays public money to polluters to pollute less by carrying out projects and earning a credit. There are also ERF carbon sequestration projects by non-polluters. This is an unusual scheme as it does not impose a rule on emitters to limit their emissions; that is supposed to be found in the SM.

The SM targets Australia's largest emitters who are emitting more than 100,000 tonnes of CO<sub>2</sub>-e per year. 211 facilities were covered under the SM between 2017-2018 accounting to about 26% of Australia's GHGe.<sup>283</sup> There are many more facilities emitting below SM threshold amount that are not regulated by national law.

Further, the SM imposes a sector-wide baseline for the electricity sector, which results in less promotion on the use of RE. The Grattan Institute recommends having an intensity baseline for this sector.<sup>284</sup> This would be a more effective approach for the sector, as most of Australia's electricity and GHGe are from the fossil fuel industry.

The CPM appears to have been more effective in reducing GHGe, compared to the ERF and SM. However, due to political influences and changes, and lack of popular understanding of the mechanism, the CPM was not well received and was repealed. The ERF and SM also have its advantages.<sup>285</sup> However, the ability of these policies to reduce GHGe are failing, and GHGe has been rising annually.

## Conclusion

As discussed, Australia's climate policies appear to be ambiguous or an 'eyewash'. Australia's GHGe have been rising since the repeal of the Clean Energy Act package. There is doubt as to whether the ERF (now CSP) and SM can reduce total GHGe and help Australia to achieve the *PA* targets because there are no limits on the level of GHGe and no statutory measures to mandate reductions of GHGe.

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<sup>283</sup> Australian Government, Department of Industry, Science, Energy and Resources, Parliament of Australia, *Report of the Expert Panel examining additional sources of low cost abatement* (Report, 14 February 2020) 73, 75 <<https://www.industry.gov.au/sites/default/files/2020-05/expert-panel-report-examining-additional-sources-of-low-cost-abatement.pdf>>.

<sup>284</sup> Tony Wood and David Blowers, 'Climate phoenix, A sustainable Australian climate policy', *Grattan Institute* (Web Page, April 2016) 23 <<https://grattan.edu.au/wp-content/uploads/2016/04/870-Climature-Phoenix.pdf>>.

<sup>285</sup> The advantages and disadvantages of the ERF and SM is discussed in sections 3.2.1 and 3.2.2.

The Australian political environment has challenged the development of legislation, policies and 'market-based instruments'<sup>286</sup> to address climate change. The focus has been on business, industry and party politicking, leaving climate change as a secondary consideration.<sup>287</sup> Efforts from different governments over time resulted in different policies being created across the years, the result of 'complex political games of the leading Australian political parties'.<sup>288</sup> According to Frank Jotzo, the research director at the Australian National University Crawford School, there is a possibility for Australia to meet its 2030 target, provided there are effective and consistent policies.<sup>289</sup> Therefore, some commentators are of the view that RE can help Australia meet that target, in the electricity sector.<sup>290</sup> Other options presented include displacing coal nationally with gas and developing carbon capture and storage. The EPA WA has suggested the use of environmental offsets to reduce net GHGe. These options can help reduce GHGe in Australia significantly if implemented. Questions remain as to whether current legislation and policy can help to reduce GHGe in the fossil fuel industry and help Australia to achieve its *PA* targets. The examination of legislation and policy establishes a framework leading to a comparative discussion in chapters 4-6.

The next chapter will give an overview of the regulation of the GHGe in Norway. It sets out the approach Norway has taken to reduce GHGe bearing in mind its commitments under the International legal framework, highlighting the climate change mitigation legislation and policies.

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<sup>286</sup> Examples of market-based instruments include the carbon tax and emissions trading scheme.

<sup>287</sup> Evgeny Guglyuvatyy and Natalie P. Stoianoff, 'Carbon Policy in Australia – A Political History' (2016) *Green Fiscal Reform for a Sustainable Future* 31, 47.

<sup>288</sup> Evgeny Guglyuvatyy and Natalie P. Stoianoff, 'Carbon Policy in Australia – A Political History' (2016) *Green Fiscal Reform for a Sustainable Future* 31, 44.

<sup>289</sup> Adam Morton, 'In A Canter? Climate Experts Say Australia Will Not Meet Emissions Targets', *The Guardian* (online, 11 October 2018) <<https://www.theguardian.com/australia-news/2018/oct/11/in-a-canter-climate-experts-say-australia-will-not-meet-emissions-targets>>.

<sup>290</sup> Kate McCallum, 'The War on Solar and Wind: Australian Renewable Energy Policy' (2017) 34 *Environmental and Planning Law Journal* 69, 70.

## Chapter 3: Norwegian Law & Policy on Greenhouse Gas Emissions

### Introduction

Norway is at the forefront of the oil and gas industry and a leader in climate change policies. This chapter provides a brief background of Norway's oil and gas industry and greenhouse gas emissions (GHGe), and an overview of the evolution of climate policies and legislative choices in Norway from late 1980s until the present.

Norway has ambitious targets for GHGe reduction. This chapter focuses on Norwegian GHGe regulation. The purpose of this chapter is to analyse the climate policy and legislation that Norway has adopted which have enabled it to modestly reduce its GHGe and attain a relatively stable level of emissions despite high levels of oil and gas production. Legislation introduced in Norway includes the *Pollution Control Act 1981*<sup>1</sup> (*PCA 1981*), a carbon tax (*CO<sub>2</sub> Tax Act 1991*),<sup>2</sup> *Petroleum Activities Act 1996*<sup>3</sup> (*PAA 1996*), emissions trading scheme (ETS) (*Directive 2003/87/EC*<sup>4</sup> and *Directive 2018/410/EC*)<sup>5</sup>,<sup>6</sup> *Greenhouse Gas Emissions Trading Act 2004*<sup>7</sup> (*GGETA 2004*) and *Climate Change Act 2017*<sup>8</sup> (*CCA 2017*), which will be discussed further in sections 2.0 and 3.0 of this chapter. Cross-sectoral economic policy instruments, the carbon tax and ETS, play an important role in Norway implementing the 'polluter pays' principle and achieving cost effectiveness in GHGe reduction.

Norway's vision is to achieve 40% emissions reductions by 2030<sup>9</sup> and to be a low emission society by 2050.<sup>10 11</sup> This may be feasible, as Norway is working very closely with

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<sup>1</sup> *Pollution Control Act 1981* (Norway) (as amended in 2003) (*'PCA 1981'*).

<sup>2</sup> This Act is also known as Act 21 December 1990 no. 72 relating to tax on discharge of CO<sub>2</sub> in the petroleum activities on the continental shelf.

<sup>3</sup> *Petroleum Activities Act 1996* (Norway) (Act 29 November 1996 No. 72 relating to petroleum activities).

<sup>4</sup> *Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC* [2003] OJ C 75E/33 (*'Directive 2003/87/EC'*).

<sup>5</sup> *Directive (EU) 2018/410 of the European Parliament and of the Council of 14 March 2018 amending Directive 2003/87/EC to enhance cost-effective emissions reductions and low-carbon investments, and Decision (EU) 2015/1814* [2018] OJ L 76/3 (*'Directive 2018/410'*).

<sup>6</sup> An EU Directive is a legislative Act that sets legally binding goals to the Member States without setting ways to achieve the goals.

<sup>7</sup> *Greenhouse Gas Emissions Trading Act 2004* (Norway) Act of 17 December 2004 No. 99 relating to Greenhouse Gas Emission Allowance Trading and the Duty to Surrender Emission Allowances.

<sup>8</sup> *Climate Change Act 2017* (Norway).

<sup>9</sup> *Climate Change Act 2017* (Norway) s 3.

<sup>10</sup> *Climate Change Act 2017* (Norway) s 1 and 4.

<sup>11</sup> Norwegian Ministry of Climate and Environment, Parliament of Norway, *Status report as of January 2018 Norway's Seventh National Communication Under the Framework Convention on Climate Change* (Report, January 2018) 63-64.

the European Union (EU), making it easier for Norway to achieve its climate targets. The European Economic Area (EEA) agreement was entered into between Norway and the EU, making the EU Directives binding. Section 1.4 will further elaborate on the EEA agreement and the importance of the EU in maintaining low emissions in Norway. The chapter concludes with a summary analysis of whether Norway's legislation and policies are reducing GHGe in the fossil fuel industry and economy wide.

## **1.0 Brief Background - Norway**

### *1.1 The Norwegian Constitution of 1814<sup>12</sup>*

The Norwegian Constitution provides the right to a 'conducive' health and environment, and right to information on the state of the environment. This shows Norway's level of seriousness on environmental issues and explains Norway's adoption of emissions reduction mechanisms such as the carbon tax and ETS. However, over time, as the oil and gas industry expanded, maintaining a 'conducive' environment has been a difficult task for Norway. The evolution of climate policies from the late 1980s will be analysed in depth in section 2.0, showing Norway's progress in addressing the issue of climate change.

According to the *Norwegian Constitution 1814* art 112:

Every person has the right to an environment that is conducive to health and to a natural environment whose productivity and diversity are maintained. Natural resources shall be managed on the basis of comprehensive long-term considerations which will safeguard this right for future generations as well. In order to safeguard their right in accordance with the foregoing paragraph, citizens are entitled to information on the state of the natural environment and on the effects of any encroachment on nature that is planned or carried out. The authorities of the state shall take measures for the implementation of these principles.

The Constitution articulates Norway's societal, political, human rights, and cultural perspectives on environmental matters. In contrast, Australia's Constitution is silent on these matters.

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<[http://unfccc.int/files/national\\_reports/annex\\_i\\_natcom/submitted\\_natcom/application/pdf/529371\\_norway-nc7-br3-1-nc7\\_-\\_br3\\_-\\_final.pdf](http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/529371_norway-nc7-br3-1-nc7_-_br3_-_final.pdf)>.

<sup>12</sup> *The Constitution of the Kingdom of Norway 1814* (Norway). This Constitution was laid down on 17 May 1814 and revised in 2014. It was subsequently amended by Resolution of 7 January 2020. Source: Lovdata, *The Constitution of the Kingdom of Norway* (Web Page, 16 January 2020) <<https://lovdata.no/dokument/NLE/lov/1814-05-17>>.

## 1.2 History of Oil and Gas in Norway

The Norwegians were not aware that the Norwegian Continental Shelf (NCS) was rich in oil and gas deposits until gas was discovered at Groningen, Netherlands in 1959.<sup>13</sup> This led to their eager exploration for oil and gas deposits in their own territory. Philips Petroleum sent an application of its interest to conduct exploration in the North Sea in October 1962. The Norwegian Government was hesitant and refused to sign the said offer, as it did not want to give exclusive rights to one company over the entire NCS, as they were afraid of monopolisation.<sup>14</sup> After this incident, a regulation was passed in May 1963, whereby the NCS was held under the sovereignty of the King who decides whether to award the licences for exploration and production of oil and gas.<sup>15</sup>

Subsequently, in 1965, an issue arose over the delimitation of the NCS from the continental shelf claims of the United Kingdom and Denmark. This issue was resolved with the median line principle and a treaty between Norway and United Kingdom.<sup>16</sup> The first discovery of oil was at Ekofisk in 1969<sup>17</sup> which led to a boom in Norway's economy that changed the entire Norwegian standard of living. Before the oil discovery, Norway had focused on its fishing industry.

The Norwegian Parliament then adopted the '10 oil commandments' in 1971, which are principles underpinning the oil policy.<sup>18</sup> According to the fourth commandment, 'the development of an oil industry must take place with necessary consideration for existing commercial activity, as well as protection of nature and the environment'.<sup>19</sup> This indicates the priority placed explicitly on both commercial activity and environmental concerns.

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<sup>13</sup> Katarzyna Dospial-Borysiak, 'Model of State Management of Petroleum Sector-Case of Norway' (2017) 20(1) *Interdisciplinary Political and Cultural Journal* 97, 98.

<sup>14</sup> Government of Norway, *Norway's oil history in 5 minutes* (Web Page, 09 October 2013) <<https://www.regjeringen.no/en/topics/energy/oil-and-gas/norways-oil-history-in-5-minutes/id440538/>>.

<sup>15</sup> Government of Norway, *Norway's oil history in 5 minutes* (Web Page, 09 October 2013) <<https://www.regjeringen.no/en/topics/energy/oil-and-gas/norways-oil-history-in-5-minutes/id440538/>>.

<sup>16</sup> Norsk olje & gass, *Norway's petroleum history* (Web Page, 19 October 2017) <<https://www.norskoljeoggass.no/en/about-us/oljehistorien/>>.

<sup>17</sup> Norwegian Petroleum, *Norway's petroleum history* (Web Page, 19 October 2017) <<https://www.norskpetsroleum.no/en/framework/norways-petroleum-history/>>.

<sup>18</sup> 'Storting White Paper 28 (2010-2011) – Unofficial translation of Chapter 1: An Industry for the Future – Norway's Petroleum Activities', (Web Page) <[https://www.regjeringen.no/globalassets/upload/oed/petroleumsmeldingen\\_2011/oversettelse/chapter1\\_white\\_paper\\_28-2010-2011.pdf](https://www.regjeringen.no/globalassets/upload/oed/petroleumsmeldingen_2011/oversettelse/chapter1_white_paper_28-2010-2011.pdf)>; Norsk olje & gass, *Norway's petroleum history* (Web Page, 19 October 2017) <<https://www.norskoljeoggass.no/en/about-us/oljehistorien/>>.

<sup>19</sup> 'Storting White Paper 28 (2010-2011) – Unofficial translation of Chapter 1: An Industry for the Future – Norway's Petroleum Activities', (Web Page) <[https://www.regjeringen.no/globalassets/upload/oed/petroleumsmeldingen\\_2011/oversettelse/chapter1\\_white\\_paper\\_28-2010-2011.pdf](https://www.regjeringen.no/globalassets/upload/oed/petroleumsmeldingen_2011/oversettelse/chapter1_white_paper_28-2010-2011.pdf)>.

The majority of oil and gas produced in Norway is exported. More than 90% of Norway's petroleum<sup>20</sup> production is sold to Europe.<sup>21</sup> Norway ranks as the third-largest exporter of gas in the world.<sup>22</sup> 95% of the gas exported is transported by subsea pipelines and about 5% is transported as liquefied natural gas (LNG) by ship.<sup>23</sup> The fossil fuel industry forms an important part of Norway's economy but is less important as a domestic energy source.<sup>24</sup>

Revenues earned from oil and gas activities are channelled towards the Government Pension Fund Global. This fund invests in stocks, real estate, currencies and other investments.<sup>25</sup> The main aim of this fund is to benefit Norwegian society.<sup>26</sup> Norway has managed its petroleum resources well and focused on the development of the country.<sup>27</sup>

In Norway, most of the energy consumed is electricity generated by hydropower (i.e. about 95%)<sup>28</sup> and has no emissions. However, high production levels of oil and gas for domestic use and export is increasing emissions in Norway. Comparatively, Australia generates most of its electricity using coal (i.e fossil fuel sources contributed to 81% of Australia's total electricity generation in 2018 of which coal accounted for 60%).<sup>29</sup> Thus, the

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ter1\_white\_paper\_28-2010-2011.pdf>; Norsk olje & gass, *Norway's petroleum history* (Web Page, 19 October 2017) <<https://www.norskoljeoggass.no/en/about-us/oljehistorien/>>.

<sup>20</sup> Petroleum for the purposes of this thesis discussion means oil and gas.

<sup>21</sup> KonKraft, 'Climate and The Norwegian Continental Shelf KonKraft Report No. 2016-2', (Web Page, August 2016) 6 <[http://konkraft.no/wp-content/uploads/2016/08/Klimarapport\\_engelsk\\_komprimert\\_web.pdf](http://konkraft.no/wp-content/uploads/2016/08/Klimarapport_engelsk_komprimert_web.pdf)>.

<sup>22</sup> Norwegian Petroleum, *Exports of Oil and Gas* (Web Page)

<<https://www.norskpetroleum.no/en/production-and-exports/exports-of-oil-and-gas/>>;

Government.no, *Gas exports from the Norwegian shelf* (Web Page, 04 May 2018)

<<https://www.regjeringen.no/en/topics/energy/oil-and-gas/Gas-exports-from-the-Norwegian-shelf/id766092/>>.

<sup>23</sup> Norwegian Petroleum, *Exports of Oil and Gas* (Web Page)

<<https://www.norskpetroleum.no/en/production-and-exports/exports-of-oil-and-gas/>>.

<sup>24</sup> K. M. Merritt-Thrasher, 'Tracing the Steps of Norway's Carbon Footprint: Lessons Learned from Norway and the European Union concerning the Regulation of Carbon Emissions' (2011) 21(2) *Indiana International & Comparative Law Review* 319, 329 citing Annegrete Bruvoll & Bodil Merethe Larsen, Statistics Nor., Research Dep't, Greenhouse Gas Emissions in Norway – Do Carbon Taxes Work? 16 (2002), available at <http://www.ssb.no/publikasjoner/DP/pdf/dp337.pdf> 5,11.

<sup>25</sup> Norges Bank Investment Management, *About the Fund* (Web Page) <<https://www.nbim.no/en/the-fund/about-the-fund/>>.

<sup>26</sup> Norges Bank Investment Management, *About the Fund* (Web Page) <<https://www.nbim.no/en/the-fund/about-the-fund/>>.

<sup>27</sup> Tina Hunter, *Legal Regulatory Framework for the Sustainable Extraction of Australian Offshore Petroleum Resources* (PHD Thesis, The University of Bergen, 2010) 30-33

<[http://bora.uib.no/bitstream/handle/1956/4505/Dr.thesis\\_Tina%20Hunter.pdf?sequence=1&isAllowed=y](http://bora.uib.no/bitstream/handle/1956/4505/Dr.thesis_Tina%20Hunter.pdf?sequence=1&isAllowed=y)>.

<sup>28</sup> Statistics Norway, *Electricity* (Web Page, 02 December 2019) <<https://www.ssb.no/en/energi-og-industri/statistikker/elektrisitet/aar>>.

<sup>29</sup> Australian Government Department of Environment and Energy, Parliament of Australia, *Australian Energy Statistics, Table O: Australian Electricity Generation, by Fuel Type, Physical Units* (Report, March 2019) <[https://www.energy.gov.au/sites/default/files/2019\\_aes\\_table\\_o\\_march\\_2019.pdf](https://www.energy.gov.au/sites/default/files/2019_aes_table_o_march_2019.pdf)>; Australian Government Department of Environment and Energy, Parliament of Australia, *Australian Energy Update 2019* (Report, September 2019) 1, 28

domestic energy profiles of each country are substantially different. Norway's national determined contribution (NDC) is more ambitious than Australia's. This may be due to Australia's heavier dependence on fossil fuels for electricity generation compared to Norway, which relies heavily on hydropower.

### *1.3 Norway's Greenhouse Gas Emissions*

Norway's CO<sub>2</sub> emissions are mainly from:

- a) the oil and gas industry;
- b) manufacturing industries and mining;
- c) road transport; and
- d) other transport (i.e. aviation).

As mentioned in the introductory chapter, most of Norway's GHGe are CO<sub>2</sub> emissions from offshore petroleum activities. According to Statistics Norway, total national GHGe had dropped by 1.7% in 2017 and 1.4% from oil and gas extraction between 2016-2017.<sup>30</sup> GHGe also reduced by 0.9% between 2017-2018.<sup>31</sup> Based on Figures 5 and Figure 6 below, Norway has modestly reduced its GHGe and appears likely to have attained a relatively stable level of emissions between the years 2009-2015. CO<sub>2</sub> emissions have been dropping slowly from 2015-2017 (Figures 5 and 6). From 2018, the level of emissions is projected to be relatively stable.<sup>32</sup>

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<[https://www.energy.gov.au/sites/default/files/australian\\_energy\\_statistics\\_2019\\_energy\\_update\\_report\\_september.pdf](https://www.energy.gov.au/sites/default/files/australian_energy_statistics_2019_energy_update_report_september.pdf)>.

<sup>30</sup> Statistics Norway, *Emissions to Air* (Web Page, 15 August 2018)

<<https://www.ssb.no/en/klimagassn>>, archived at

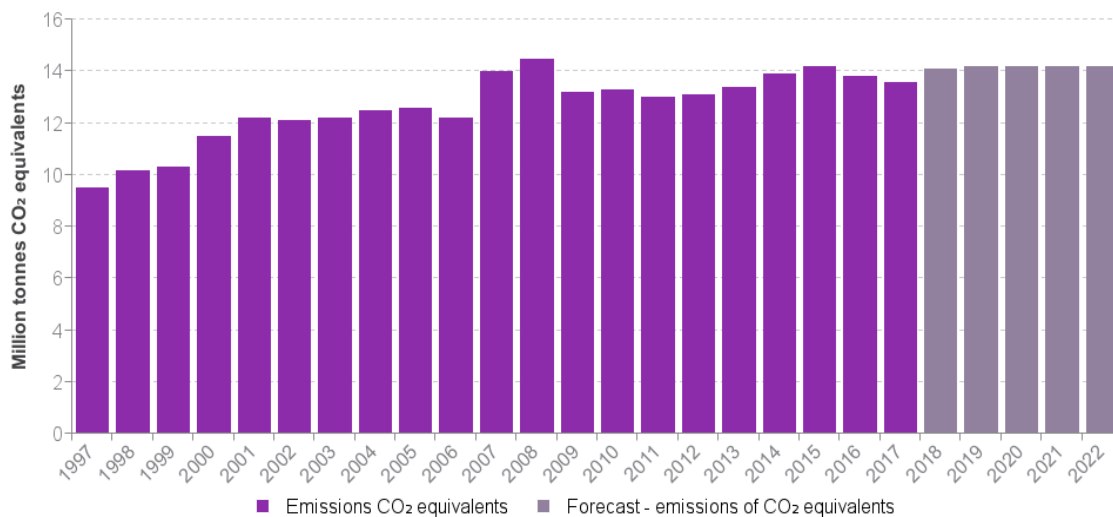
<<https://web.archive.org/web/20181116190004/https://www.ssb.no/en/klimagassn>>.

<sup>31</sup> Statistics Norway, *Emissions to Air* (Web Page, 14 January 2020) <[ssb.no/en/klimagassn](https://www.ssb.no/en/klimagassn)>.

<sup>32</sup> GHGe data for 2019 is not available yet.



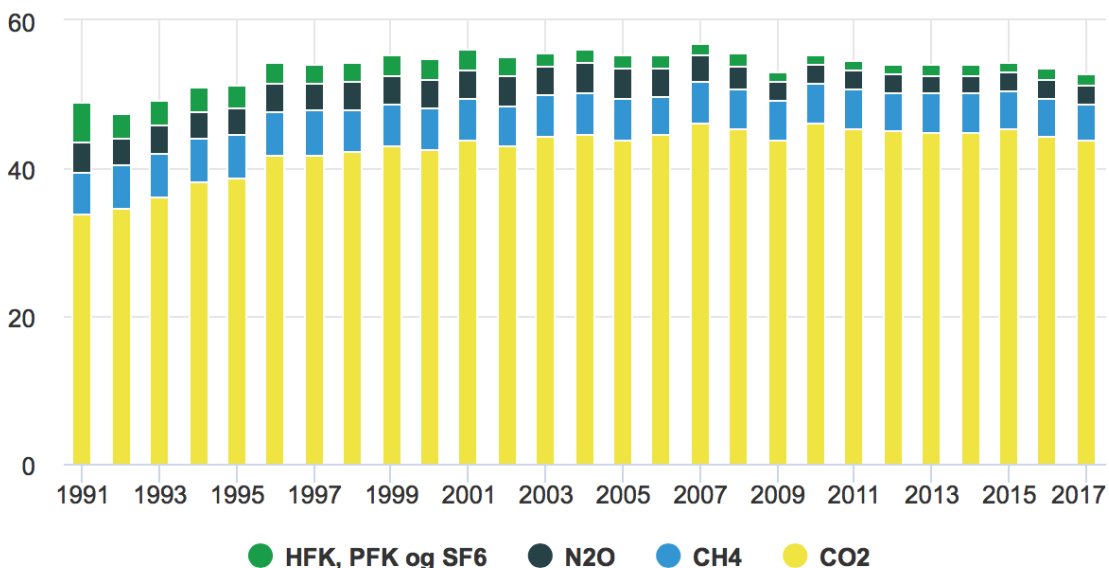
**Figure 5: Norway's emissions from the petroleum sector from 1997-2017 and projections for 2018-2022<sup>33</sup>**



**Figure 6: Level of greenhouse gas emissions from 1991-2017<sup>34</sup>**

**Figur 1. Utvikling i klimagassutslipp**

Mill. tonn CO<sub>2</sub>-ekvivalenter



Kilde: Utslipp til luft, Statistisk sentralbyrå.

<sup>33</sup> Norwegian Petroleum, *Emissions to Air* (Web Page) <<https://www.norskpetroleum.no/en/environment-and-technology/emissions-to-air/>>.

#### 1.4 Norway's Relationship with the European Union

Norway is not a member of the EU but is a party to the EEA Agreement that was entered into in 1994, which integrated Norway into the EU Single Market along with 28 EU Member States, plus Iceland and Liechtenstein.<sup>35</sup> As part of the EEA agreement, Norway is obliged to adopt the EU's energy and climate policies.

The EEA Agreement was entered into with a view of strengthening trade and economic relations between the EEA States and the EU Member States.<sup>36</sup> It guaranteed the free movement of goods, persons, services and capital (i.e. four freedoms of the internal market).<sup>37</sup> The EEA Agreement focused on internal market legislation and a large part of it is concerned with environmental protection legislation.<sup>38</sup>

#### 1.5 Influential Principles in Norway

Norway has shown preference for economic instruments dealing with environmental regulation.<sup>39</sup> This is due to four principles, namely the 'polluter pays' principle, efficient governance, cost effectiveness, and cross sectoral economic instruments.<sup>40</sup> The 'polluter pays' principle is where the 'polluter should bear the cost of measures to reduce pollution according to the extent of either the damage done to society or the exceeding of an acceptable level (standard) of pollution'.<sup>41</sup> In other words, those who pollute bear the cost of polluting. The

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<sup>34</sup> Statistics Norway, *Klimagassutslipp ned 1,6 prosent* (Web Page, 11 December 2018)

<<https://www.ssb.no/natur-og-miljo/artikler-og-publikasjoner/klimagassutslipp-ned-1-6-prosent>>.

<sup>35</sup> Government.no, *Brief History about the EEA* (Web Page, 15 April 2016)

<<https://www.regjeringen.no/en/topics/european-policy/eos/history-eea/id2458261/>>; Main Part of the EEA Agreement 1994; Norway and the EU, *The EEA Agreement* (Web Page, 01 March 2017) <<https://www.norway.no/en/missions/eu/areas-of-cooperation/the-eea-agreement/>>.

<sup>36</sup> Norwegian Ministry of Climate and Environment, Parliament of Norway, 'Status report as of January 2018 Norway's Seventh National Communication Under the Framework Convention on Climate Change' (Report, January 2018) 8

<[http://unfccc.int/files/national\\_reports/annex\\_i\\_natcom/submitted\\_natcom/application/pdf/529371\\_norway-nc7-br3-1-nc7\\_-\\_br3\\_-\\_final.pdf](http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/529371_norway-nc7-br3-1-nc7_-_br3_-_final.pdf)>.

<sup>37</sup> Norwegian Ministry of Foreign Affairs, 'Norway and the EU – Partners for Europe', (Web Page) 3, 8 <[https://www.regjeringen.no/globalassets/departementene/ud/vedlegg/europapolitikk/norway\\_eu.pdf](https://www.regjeringen.no/globalassets/departementene/ud/vedlegg/europapolitikk/norway_eu.pdf)>; European Parliament, *The European Economic Area (EEA), Switzerland and the North* (Web Page) <<https://www.europarl.europa.eu/factsheets/en/sheet/169/the-european-economic-area-eea-switzerland-and-the-north>>.

<sup>38</sup> The Environmental protection legislation is emphasised in Annex XX to the EEA Agreement 1994.

<sup>39</sup> Catherine Banet, 'Effectiveness in Climate Regulation: Simultaneous Application of a Carbon Tax and an Emissions Trading Scheme to the Offshore Petroleum Sector in Norway' (2017) 11(1) *Carbon and Climate Law Review* 25, 27.

<sup>40</sup> Catherine Banet, 'Effectiveness in Climate Regulation: Simultaneous Application of a Carbon Tax and an Emissions Trading Scheme to the Offshore Petroleum Sector in Norway' (2017) 11(1) *Carbon and Climate Law Review* 25, 27.

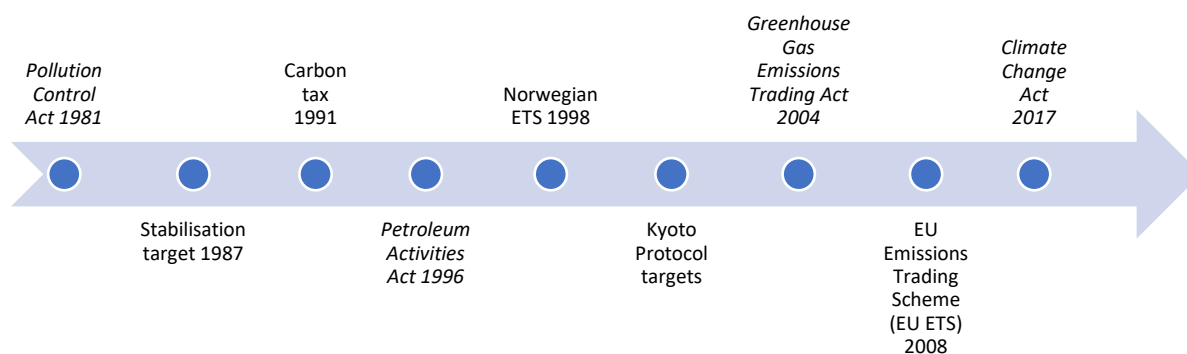
<sup>41</sup> OECD, *Glossary of Statistical Terms Polluter-Pays-Principle* (Web Page, 11 December 2001) <<https://stats.oecd.org/glossary/detail.asp?ID=2074>>.

'polluter pays' principle was recognised as early as 1972 by the Organisation for Economic Co-operation and Development (OECD) Council.<sup>42</sup> This principle is reflected in *PCA 1981* s 2(5) and 7. The cost effectiveness principle is seen in the *United Nations Framework Convention on Climate Change 1992 (UNFCCC)* art 3 and also the *Kyoto Protocol to the UNFCCC 1997 (KP)* art 10. The cost effectiveness principle is also reflected in the *GGETA 2004* s 1, justifying the ETS.

## 2.0 The Evolution of Significant Legislation and Policy in Norway

Norway's climate policies are divided into 3 phases: (i) enthusiastic target setting (i.e. stabilisation target), (ii) national research phase (i.e. Interdepartmental Climate Committee and Environmental Tax Committee was set up), and (iii) intensive national and international negotiations.<sup>43</sup>

Political leaders play an important role in addressing the issue of climate change.<sup>44</sup> Norwegian climate policies have evolved during different Prime Ministerships, as each Prime Minister had different views on climate change and environmental concerns. The timeline below shows the evolution of significant legislation and policies from 1981.



<sup>42</sup> Organisation for Economic Co-operation and Development, *The Polluter-Pays Principle: OECD Analyses and Recommendations* (Report, OCDE/GD (92) 81, 1992) Foreword <[http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=OCDE/GD\(92\)81&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=OCDE/GD(92)81&docLanguage=En)>.

<sup>43</sup> S. P. Hals, 'Changing of the Climate Guard? A Study of Climate Change Policy in Norway and the United Kingdom' (FNI Report 005-1999, The Fridtjof Nansen Institute, 1999) 17.

<sup>44</sup> Robyn Eckersley, 'Poles Apart?: The Social Construction of Responsibility for Climate Change in Australia and Norway' (2013) 59(3) *Australian Journal of Politics and History* 382, 394.

## 2.1 Pollution Control Act 1981

The *Pollution Control Act 1981 (PCA 1981)* was the first piece of legislation introduced in Norway on pollution and waste issues. It provides a basic legal framework encompassing all types of pollution and waste. The Act regulates pollution that comes from stationary sources. There is a question as to whether the *PCA 1981* regulates GHGe in Norway. This will be discussed further in section 3.1.

## 2.2 Stabilisation Target

Serious concern about climate change increased in the late 1980s when Norway faced heat waves and climate issues. A severe heat wave in 1989 triggered arguments about global warming. After this incident, then Labour Prime Minister, Gro Harlem Brundtland started to look at climate issues. Brundtland was the Minister of Environment in 1974 and became Prime Minister in 1981, and again from 1986-1996.<sup>45</sup>

Norway was at the forefront in addressing climate change in the late 1980s; it was the first country to adopt a stabilisation target and carbon tax (CO<sub>2</sub> tax). Domestic actions were maintained but it was still insufficient to deal with climate change; it is a global problem that requires joint international efforts.<sup>46</sup> In 1983, the Secretary-General of the United Nations selected Brundtland to form the World Commission on Environment and Development, also known as the Brundtland Commission.<sup>47</sup> This Commission was set up to examine environmental and development issues.<sup>48</sup>

Subsequently, in 1987, the Commission published the Brundtland report (*Our Common Future*) which emphasised the concept of 'sustainable development' defined as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'.<sup>49</sup> It entails a compromise between environmental

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<sup>45</sup> Government.no, *Gro Harlem Brundtland* (Web Page, 31 May 2011) <<https://www.regjeringen.no/en/the-government/previous-governments/historiske-artikler/offices/prime-minister-since-1814/gro-harlem-brundtland/id463420/>>.

<sup>46</sup> S. Andresen and S. Hals Butenschøn, 'Norwegian Climate Policy: From Pusher to Laggard?' (2001) 1 *Law and Economics* 337, 339.

<sup>47</sup> Gro Harlem Brundtland, 'For Global Cooperation on Environmental Problems' (1989) 15(4) *Population and Development Review* 784, 784.

<sup>48</sup> Gro Harlem Brundtland, 'For Global Cooperation on Environmental Problems' (1989) 15(4) *Population and Development Review* 784, 784.

<sup>49</sup> United Nations, *Report of the World Commission on Environment and Development: Our Common Future* (Report, 1987) 1, 41 <<https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>>.

protection, economic growth and social development. This report had a global influence and was a strong driving force for environmental concerns in Norway.

In 1989, the Government released a white paper entitled 'Environment and Development' with a vision of Norway becoming a 'pioneer country' of environmental change.<sup>50</sup> Climate change was a prominent topic in the late 1980s to early 1990s, and Brundtland was determined to take action. Brundtland looked for technological and economic solutions to address the issue of climate change. She supported carbon capture and storage (CCS), and clean development mechanisms.<sup>51</sup>

The publication of the Brundtland report and Norway's first targets on CO<sub>2</sub> emissions showed increased environmental awareness.<sup>52</sup> Norway was the first country in the world to set a target to stabilise CO<sub>2</sub> emissions at 1989 levels by 2000, the stabilisation target.<sup>53</sup> It was a preliminary target which was to be evaluated continuously to adapt to technology changes and international agreements on climate change.<sup>54</sup> As a result, the Brundtland Commission initiated research programs and two centres were created, the Centre for Development and the Environment, and the Centre for International Climate Research (CICERO). These centres were created to conduct research and assist Norway in achieving its 'sustainable development' vision. A year after the Brundtland report, the Norwegian Government released White Paper no. 46 (Report to the Storting No. 46 1988-1989).<sup>55</sup> It detailed environmental problems and potential policies,<sup>56</sup> and became a foundation for Norway's environmental policies.

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<sup>50</sup> Peder Anker, 'A Pioneer Country? A History of Norwegian Climate Politics' (2018) 151 *Climate Change* 29, 34 citing Ministry of the Environment (1989) St.meld. nr 46 (1988–1989): Miljø og utvikling: Norges oppfølging av Verdenskommisjonens rapport. Government Printing, Oslo.

<sup>51</sup> Peder Anker, 'A Pioneer Country? A History of Norwegian Climate Politics' (2018) 151 *Climate Change* 29, 29.

<sup>52</sup> Catherine Banet, 'Effectiveness in Climate Regulation: Simultaneous Application of a Carbon Tax and an Emissions Trading Scheme to the Offshore Petroleum Sector in Norway' (2017) 11(1) *Carbon and Climate Law Review* 25, 27.

<sup>53</sup> Organisation for Economic Co-operation and Development, *Norway* (Report) <<https://www.oecd.org/env/country-reviews/2450976.pdf>>.

<sup>54</sup> J. B. Skjaereth, *International Regimes and Norway's Environmental Policy Crossfire and Coherence* (Routledge, 2018) Chapter 7, 2.

<sup>55</sup> This report was titled *Environment and Development: Programme for Norway's Follow-Up of the Report of the World Commission on Environment and Development*.

<sup>56</sup> Brianna Stocks, 'Environmental Policy in Scandinavia An Analysis of Norway's Rising CO<sub>2</sub> Emissions' (Senior Honors Thesis, University of California, 2017) 31-32 citing Clayton, Barry Dalal. *Getting to Grips with Green Plans: National-level Experience in Industrial Countries*. Ebook ed., Routledge, 2013.

As a response to the stabilisation target, the Environmental Tax Committee was established in 1989 to evaluate an environmental tax option.<sup>57</sup> The Committee produced a report emphasising the efficiency of economic instruments by applying taxes, mainly focusing on cost effectiveness. The Committee opined that the Government should adopt a 'flexible approach' to achieve this goal due to the high costs involved.<sup>58</sup> The stabilisation target was criticised for being 'far from sufficient' and too ambitious.<sup>59</sup> In 1992, due to the economic recession, the Environmental Tax Committee was of view that Norway should move away from the stabilisation target.

As the stabilisation target was not well received, the Norwegian Government considered other policy instruments to reduce GHGs, namely regulatory and market/economic (e.g. ETS, environmental taxes). Between 1989-1990, the Norwegian Government proposed a CO<sub>2</sub> tax on mineral oil and gasoline. In the late 1990s, environmental taxes were broadened to include emissions from oil and gas in petroleum production. This tax is levied on all combustion of gas, oil and diesel in petroleum operations on the continental shelf which releases CO<sub>2</sub>.<sup>60</sup>

The carbon tax was the principal tool for achieving the stabilisation target. Environmental taxes were strongly rejected by the oil and gas industry on the basis that they imposed high costs and resulted in employment losses. There was also contention that the stabilisation target conflicted with the oil and gas industry's economic interests and prevented its expansion.<sup>61</sup>

By 1994, despite having the CO<sub>2</sub> tax, CO<sub>2</sub> emissions had increased significantly from 1989 levels, and the stabilisation target was proving unsuccessful.<sup>62</sup> The unwillingness of the Government to adopt ambitious measures imposing higher costs to industry contributed to the

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<sup>57</sup> Sjur Kasa, 'Policy networks as barriers to green tax reform: The case of CO<sub>2</sub>- taxes in Norway' (2000) 9(4) *Environmental Politics* 104, 106-107; M. Reitan, 'Ecological Modernisation and 'Realpolitik': Ideas, Interests and Institutions' (1998) 7(2) *Environmental Politics* 1, 6.

<sup>58</sup> M. Reitan, 'Ecological Modernisation and 'Realpolitik': Ideas, Interests and Institutions' (1998) 7(2) *Environmental Politics* 1, 7.

<sup>59</sup> J. B. Skjaerseth, *International Regimes and Norway's Environmental Policy Crossfire and Coherence* (Routledge, 2018) Chapter 7, 2.

<sup>60</sup> *CO<sub>2</sub> Tax Act 1991* (Norway) s 1 and 2. The carbon tax application in Norway is explained in section 3.2.

<sup>61</sup> G. Bang et al, 'Meeting Kyoto Commitments: European Union Influence on Norway and Germany' (CICERO Working Paper 2004:12, CICERO, December 2004) 8 <[https://pub.cicero.oslo.no/cicero-xmlui/bitstream/handle/11250/192304/CICERO\\_Working\\_Paper\\_2004-12.pdf?sequence=1&isAllowed=y](https://pub.cicero.oslo.no/cicero-xmlui/bitstream/handle/11250/192304/CICERO_Working_Paper_2004-12.pdf?sequence=1&isAllowed=y)>.

<sup>62</sup> Statistics Norway, *35 Emissions to Air* (Web Page) <<https://www.ssb.no/a/english/aarbok/tab/tab-035.html>>.

failure of the stabilisation target. In 1995, the stabilisation target was abandoned.<sup>63</sup> This was due to increasing joint international efforts, which downplayed domestic actions.<sup>64</sup>

The main drivers towards low emissions were the commitments under the *UNFCCC* and the EEA. The *UNFCCC* was signed in 1992 and was ratified by Norway in July 1993.<sup>65</sup> This Convention's principles focused on cost effectiveness, joint implementation and differentiated commitments. Although the *UNFCCC* was weak on setting emissions commitments, it was a starting point for further negotiations on binding emissions commitment, which led to the formulation of the *KP*.

In 1994, there were plans by politicians to build gas-based power stations with a view that gas-based electricity could replace electricity generated by coal in the Nordic countries (Sweden and Denmark).<sup>66</sup> In order to look at climate change in an international context, politicians brought up this debate to justify their expansion of the oil and gas operations in Norway to supply to the EU.<sup>67</sup> Brundtland opposed the proposal to build an onshore gas-fired power station fearing that it would compromise the stabilisation target.<sup>68</sup> This was in relation to the Heidrun offshore field.

Also in 1994, the Green Tax Commission was established to find solutions for balancing environmental and economic goals.<sup>69</sup> This Commission was appointed by the Ministry of Finance and contained members from interest groups and ministries. The Commission suggested extending the carbon tax to other industries. This was not welcomed by the oil and gas industry, and led to the Commission's proposed extension failing. The

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<sup>63</sup> Eivind Hovden and Gard Lindseth, *Discourses in Norwegian Climate Policy: National Action or Globally Thinking* (Report No. 10/02, 2002) 7 citing MoE (Norwegian Ministry of the Environment) (1995): White Paper 41 (1994-95): Om norsk politikk mot klimaendringer og utslipp av nitrogenoksyder (NOx), Oslo: Miljøverndepartementet <[http://www.prosus.org/prosusFTP/prosusrep/publications/prosusrep2002\\_10.pdf](http://www.prosus.org/prosusFTP/prosusrep/publications/prosusrep2002_10.pdf)>; J. B. Skjaereth, *International Regimes and Norway's Environmental Policy Crossfire and Coherence* (Routledge, 2018) Chapter 7, 2.

<sup>64</sup> S. Andresen and S. Hals Butenschøn, 'Nowegian Climate Policy: From Pusher to Laggard?' (2001) 1 *Law and Economics* 337, 340.

<sup>65</sup> Norwegian Ministry of the Environment, Parliament of Norway, *Norway's Report on Demonstrable Progress Under the Kyoto Protocol Status Report as of December 2005* (Report, 2005) 6 <<https://unfccc.int/resource/docs/dpr/nor1.pdf>>.

<sup>66</sup> Eivind Hovden and Gard Lindseth, *Discourses in Norwegian Climate Policy: National Action or Globally Thinking* (Report No. 10/02, 2002) 16 <[http://www.prosus.org/prosusFTP/prosusrep/publications/prosusrep2002\\_10.pdf](http://www.prosus.org/prosusFTP/prosusrep/publications/prosusrep2002_10.pdf)>.

<sup>67</sup> Eivind Hovden and Gard Lindseth, 'Discourses in Norwegian Climate Policy: National Action or Globally Thinking' (Report No. 10/02, University of Oslo, 2002) 17.

<sup>68</sup> Eivind Hovden and Gard Lindseth, 'Discourses in Norwegian Climate Policy: National Action or Globally Thinking' (Report No. 10/02, University of Oslo, 2002) 16.

<sup>69</sup> M. Reitan, 'Ecological Modernisation and 'Realpolitik': Ideas, Interests and Institutions' (1998) 7(2) *Environmental Politics* 1, 10.

Solberg Government recommissioned this Commission in 2014, which made suggestions on how to improve environmental taxes. This is explained below in section 2.4.

### *2.3 Carbon Tax Instrument*

As early as 1991, Norway implemented a carbon tax, known as the 'country's chief climate policy instrument.'<sup>70</sup> It was an instrument created to achieve the stabilisation target. However, this instrument was insufficient to achieve that target as it only covered CO<sub>2</sub>. The carbon tax in Norway has been amended over the years to enhance its effectiveness.

Finland was the first country to introduce a carbon tax on CO<sub>2</sub> in 1990.<sup>71</sup> Subsequently, as the production of offshore oil and gas increased significantly in Norway, the Brundtland Government introduced a carbon tax in 1991 to persuade oil companies to reduce gas flaring on platforms and install more efficient gas turbines for offshore power generation.

#### *2.3.1 History of the Carbon Tax<sup>72</sup>*

In 1989, Norway participated in the Hague Ministerial Conference on the ozone layer and hosted the Bergen Conference in May 1990.<sup>73</sup> Climate change (i.e. limiting GHGe) was the main issue of discussion at the conference.<sup>74</sup> The conference participation led to increased levels of climate commitments and, eventually, the enactment of the carbon tax in 1991. Norway was one of the first countries in the world to implement a carbon tax. Sweden, Finland and Denmark also introduced a carbon tax in the early 1990s.<sup>75</sup>

The Norwegian carbon tax was the initiative of Prime Minister Jan P. Syse, who held office from 1989-November 1990.<sup>76</sup> The Syse Government established an environmental tax

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<sup>70</sup> G. Bang et al, 'Meeting Kyoto Commitments: European Union Influence on Norway and Germany' (CICERO Working Paper 2004:12, CICERO, December 2004) 9.

<sup>71</sup> A. Baranzini and S. Carattini, 'Taxation of Emissions of Greenhouse Gases' in Brimblecombe, Peter, Lal, Rattan, Stanley, Roy, Trevis, T Jack and B. Freedman, 'Global Environmental Change', (Springer Netherlands, 2014) 544.

<sup>72</sup> The term carbon tax or CO<sub>2</sub> tax is used interchangeably, and it connotes the same meaning.

<sup>73</sup> UNFCCC, *The Bergen Conference and its Proposal of Addressing Climate Change* (Web Page, 1 May 1993) <<https://unfccc.int/resource/ccsites/senegal/fact/fs220.htm>>.

<sup>74</sup> UNFCCC, *The Bergen Conference and its Proposal of Addressing Climate Change* (Web Page, 1 May 1993) <<https://unfccc.int/resource/ccsites/senegal/fact/fs220.htm>>.

<sup>75</sup> Catherine Banet, 'Effectiveness in Climate Regulation: Simultaneous Application of a Carbon Tax and an Emissions Trading Scheme to the Offshore Petroleum Sector in Norway' (2017) 11(1) *Carbon and Climate Law Review* 25, 29.

<sup>76</sup> Government.no, *Jan P. Syse's Government* (Web Page) <<https://www.regjeringen.no/en/the-government/previous-governments/regjeringer-siden-1814/historiske-regjeringer/governments-since-1945/jan-p-syses-government-1989---1990/id438730/>>.



committee<sup>77</sup> which led to the Government proposing a CO<sub>2</sub> tax to cover mineral oil and gasoline.<sup>78</sup> The carbon tax in Norway is regulated by two different acts, the *Act 21 December 1990 no.72 relating to tax on discharge of CO<sub>2</sub> in the petroleum activities on the continental shelf (CO<sub>2</sub> Tax Act 1991)* and *Act no.11 of 19<sup>th</sup> May 1933 concerning Sales tax*.<sup>79</sup>

### 2.3.2 Operation of the Carbon Tax

The carbon tax is a 'unit tax', specifying the cost of per tonne of CO<sub>2</sub> emitted.<sup>80</sup> The rate of the carbon tax started at USD\$40.10 per tonne of CO<sub>2</sub> emitted.<sup>81</sup> This was NOK257 per tonne of CO<sub>2</sub> emitted for offshore natural gas, and NOK226 per tonne for offshore oil on the continental shelf.<sup>82</sup> All Norwegian carbon taxes have increased since then.

The foundation of the carbon tax is from the Pigovian tax.<sup>83</sup> Carbon taxes are effective because they increase the price of carbon-based energy and decrease the demand for it. A carbon tax promotes energy saving and the development of alternative fuels. It encourages switching from coal to natural gas or even renewable energy (RE) sources. The carbon tax has helped Norway to modestly reduce its GHGe. It has been estimated that CO<sub>2</sub> emissions would have increased 21.1% from 1990-1999 if the carbon tax was not implemented.<sup>84</sup> This shows the effectiveness of a carbon tax.

The Government sets the tax rate and determines what the tax covers. In 2019, the tax rate is NOK1.08 per cubic metre of gas or per litre of oil or condensate emitted, NOK462

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<sup>77</sup> C. Bretteville and G.B. Sjøfting, 'From Taxes to Permits? The Norwegian Climate Policy Debate' (CICERO Report 2000:6, CICERO, 2000) 5

<<https://www.duo.uio.no/bitstream/handle/10852/32750/385.pdf?sequence=1&isAllowed=y>>.

<sup>78</sup> C. Bretteville and G.B. Sjøfting, 'From Taxes to Permits? The Norwegian Climate Policy Debate' (CICERO Report 2000:6, CICERO, 2000) 5.

<sup>79</sup> A. Bruvoll and H. M. Dalen, *Pricing of CO<sub>2</sub> emissions in Norway: Documentation of data and methods used in estimations of average CO<sub>2</sub> tax rates in Norwegian sectors in 2006* (Report 2009/16, 2009) 4

<[https://www.ssb.no/a/english/publikasjoner/pdf/doc\\_200916\\_en/doc\\_200916\\_en.pdf](https://www.ssb.no/a/english/publikasjoner/pdf/doc_200916_en/doc_200916_en.pdf)>. This Act was amended in 1993.

<sup>80</sup> A. Baranzini and S. Carattini, 'Taxation of Emissions of Greenhouse Gases' in Brimblecombe, Peter, Lal, Rattan, Stanley, Roy, Trevis, T. Jack and B. Freedman, 'Global Environmental Change', (Springer Netherlands, 2014) 545.

<sup>81</sup> Richard Baron, 'Economic/Fiscal Instruments: Taxation' (Working Paper No. 4, Organisation for Economic Co-operation and Development, 1997) 32  
<<http://www.oecd.org/environment/cc/2392474.pdf>>.

<sup>82</sup> M.S. Andersen, N. Dengsøe and A.B. Pedersen, 'An Evaluation of the Impact of Green Taxes in the Nordic Countries' (Report TemaNord 2000:561, 2000) 46  
<[https://pure.au.dk/portal/files/56716516/NMR2001\\_566.pdf](https://pure.au.dk/portal/files/56716516/NMR2001_566.pdf)>.

<sup>83</sup> B. Lin and Z. Li, 'The Effect of Carbon Tax on per Capita CO<sub>2</sub> Emissions' (2011) 39 *Energy Policy* 5137, 5138.

<sup>84</sup> J. B. Skjaereth, *International Regimes and Norway's Environmental Policy Crossfire and Coherence* (Routledge, 2018) Chapter 7, 4 citing Gemini (2002), "Ti år med CO<sub>2</sub>-avgifter", no. 4.

per tonne of CO<sub>2</sub> for combustion of natural gas, and NOK7.41 per standard cubic metre of natural gas emitted.<sup>85</sup> Norway's nominal carbon tax rate as of November 2018 was US\$59.87 per tonne of CO<sub>2</sub> (equivalent to approximately NOK545).<sup>86</sup> The carbon tax covers CO<sub>2</sub> emissions from diesel, gasoline, liquified petroleum gas (LPG) and natural gas. Norway has the highest carbon tax in the world.<sup>87</sup> The carbon tax applies to about 64% of Norway's total CO<sub>2</sub> emissions.<sup>88</sup> The carbon tax rates are reviewed every year.

## *2.4 Development of Norwegian Emissions Trading Scheme and European Union Emissions Trading Scheme*

### *2.4.1 Kyoto Protocol Targets*

Norway ratified the *Kyoto Protocol 1997 (KP)* in May 2002 which came into force in February 2005.<sup>89</sup> The *KP* target was to reduce the overall emissions by 'at least 5 per cent below 1990 levels' between 2008-2012.<sup>90</sup> The *KP* consists of three mechanisms; namely, for emissions trading,<sup>91</sup> joint implementation<sup>92</sup> and clean development.<sup>93</sup>

Norway agreed to have national commitments under the *KP*, which replaced the stabilisation target.<sup>94</sup> The emissions target for Norway under the *KP* was to ensure that Norway's GHGe did not exceed its '1990-level by more than one per cent in the period 2008-

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<sup>85</sup> Norwegian Petroleum, *Emissions to Air* (Web Page)

<<https://www.norskpetroleum.no/en/environment-and-technology/emissions-to-air/>>.

<sup>86</sup> United Nations, *Committee of Experts on International Cooperation in Tax Matters* (Report, 2 April 2019) 73-74 <[https://www.un.org/esa/ffd/wp-content/uploads/2019/04/18STM\\_CRP4-Environmental-tax-issues.pdf](https://www.un.org/esa/ffd/wp-content/uploads/2019/04/18STM_CRP4-Environmental-tax-issues.pdf)>.

<sup>87</sup> Norwegian Petroleum, *Emissions to Air* (Web Page)

<<https://www.norskpetroleum.no/en/environment-and-technology/emissions-to-air/>>; A. Bruvoll and B.M. Larsen, 'Greenhouse Gas Emissions in Norway: Do Carbon Taxes Work?' (2004) 32 *Energy Policy* 493, 493.

<sup>88</sup> A. Bruvoll and B.M. Larsen, 'Greenhouse Gas Emissions in Norway: Do Carbon Taxes Work?' (2004) 32 *Energy Policy* 493, 498.

<sup>89</sup> Norwegian Ministry of the Environment, Parliament of Norway, *Norway's Report on Demonstrable Progress Under the Kyoto Protocol Status Report as of December 2005* (Report, 2005) 6 <<https://unfccc.int/resource/docs/dpr/nor1.pdf>>.

<sup>90</sup> *Kyoto Protocol to the United Nations Framework Convention on Climate Change 1997*, opened for signature 11 December 1997, 2303 UNTS 162 (entered into force 16 February 2005) art 3(1) ('*Kyoto Protocol*').

<sup>91</sup> This is provided for in *Kyoto Protocol to the United Nations Framework Convention on Climate Change 1998* art 17. The emissions trading mechanism is explained in Chapter 1.

<sup>92</sup> This is provided for in *Kyoto Protocol to the United Nations Framework Convention on Climate Change 1998* art 6. The joint implementation mechanism is explained in Chapter 1.

<sup>93</sup> This is provided for in *Kyoto Protocol to the United Nations Framework Convention on Climate Change 1998* art 12. The clean development mechanism is explained in Chapter 1.

<sup>94</sup> J. B. Skjaereth, *International Regimes and Norway's Environmental Policy Crossfire and Coherence* (Routledge, 2018) Chapter 7, 2.

2012.<sup>95</sup> The *KP* allowed Norway to exceed this target if additional quotas were purchased from other countries.<sup>96</sup>

The stabilisation target only covered CO<sub>2</sub>, while the *KP* involved different types of greenhouse gases.<sup>97</sup> The main instrument for reaching the *KP* target was the cap and trade scheme under the EU ETS. The *KP* was criticised for not setting any emissions reduction targets for developing countries.

However, the *KP* was a starting point as it encouraged the use of a cap and trade scheme. Bondevik's first Government was from 1997-2000 and its second Government was from 2001-2005.<sup>98</sup> During that time, the Ministry of Environment issued a report to the Parliament encouraging the Norwegian Government to examine the ETS.<sup>99</sup> As a result, the *KP* was ratified during Bondevik's second Government. Bondevik has been the most consistent Prime Minister on national action in Norway regarding environmental issues. After the ratification of the *KP*, the Bondevik Government suggested a follow up on the Green Tax Commission, which was rejected by the Parliament as it wanted to focus on a new alternative, the ETS.<sup>100</sup>

The Bondevik Government rejected the use of gas power with CCS and was of the view that Norway, being a rich country, should reduce emissions rather than capturing and

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<sup>95</sup> Norwegian Ministry of the Environment, Parliament of Norway, *Norway's Report on Demonstrable Progress Under the Kyoto Protocol Status Report as of December 2005* (Report, 2005) 6 <<https://unfccc.int/resource/docs/dpr/nor1.pdf>>.

<sup>96</sup> P.E.G. Medina, 'Climate Change Mitigation: A Carbon Tax or An Emissions Trading Scheme? An Analysis of the Norwegian Perspective' (Master Thesis, Norwegian School of Economics Bergen, 2013) 17 <<https://pdfs.semanticscholar.org/da94/82a6cb49dfea95cc1b03594654af811d81cc.pdf>>.

<sup>97</sup> Annex A of the *Kyoto Protocol to the United Nations Framework Convention on Climate Change 1997* provides a list of gases covered under the Kyoto Protocol. The gases covered are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>).

<sup>98</sup> Government.no, *Kjell Magne Bondevik's First Government* (Web Page) <<https://www.regjeringen.no/en/the-government/previous-governments/regjeringer-siden-1814/historiske-regjeringer/governments-since-1945/kjell-magne-bondeviks-first-government-1/id438733/>>; Government.no, *Kjell Magne Bondevik's Second Government* (Web Page) <<https://www.regjeringen.no/en/the-government/previous-governments/regjeringer-siden-1814/historiske-regjeringer/governments-since-1945/kjell-magne-bondeviks-second-government-1/id438739/>>.

<sup>99</sup> Norwegian Ministry of the Environment, Parliament of Norway, *Norwegian Climate Policy: Summary in English: Report No. 54 to the Storting (2000-2001)* (Report, June 2001) 9 <<https://www.regjeringen.no/contentassets/91b54f03dc224f3397c95b04be350f49/en-gb/pdfs/stm200020010054000engpdfs.pdf>>.

<sup>100</sup> Thorvald Moe, 'Norwegian Climate Policies 1990-2010: Principles, Policy Instruments and Political Economy Aspects' (CICERO Policy Note 2010:03) 15.

storing the emissions.<sup>101</sup> Due to that, Parliament had to vote as to whether to impose a CO<sub>2</sub> emission-free requirement on gas-based power stations after Norsk Hydro announced their plans to build gas-based power stations using new technology and zero CO<sub>2</sub> emissions.<sup>102</sup> As the Government changed to a minority coalition, Prime Minister Bondevik opposed building gas-based power stations. This led to Bondevik's resignation in March 2000, after the majority Parliamentary vote was towards building gas-based power stations using the technology that was available.<sup>103</sup>

Subsequently, a minority Labour Government was formed by Jens Stoltenberg. He became Prime Minister of Norway in 2000-2001, and his second Government was from 2005-2013.<sup>104</sup> Stoltenberg is known as the 'main architect' of Norwegian climate policy.<sup>105</sup> Stoltenberg was a strong advocate of the gas argument and strong supporter of CCS. Stoltenberg made a decision to build gas-fired power stations. In his New Year's address in 2007, he stated that 'climate change must be taken seriously' and that Norway had to take responsibility for reducing GHGe.<sup>106</sup>

In 2007, the Norwegian Government released the Climate White Paper with a view to Norway becoming a world leader in climate change.<sup>107</sup> The Government faced a challenge to minimise tensions between Norway's position as a leader in climate change policy and leader in the oil and gas industry.<sup>108</sup> During Stoltenberg's second Government, the Norwegian ETS was linked to the EU ETS. Details of the ETS are discussed in sections 2.5 and 3.3.

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<sup>101</sup> Robyn Eckersley, 'Poles Apart?: The Social Construction of Responsibility for Climate Change in Australia and Norway' (2013) 59(3) *Australian Journal of Politics and History* 382, 387.

<sup>102</sup> Eivind Hovden and Gard Lindseth, 'Discourses in Norwegian Climate Policy: National Action or Globally Thinking' (Report No. 10/02, University of Oslo, 2002) 19.

<sup>103</sup> Eivind Hovden and Gard Lindseth, 'Discourses in Norwegian Climate Policy: National Action or Globally Thinking' (Report No. 10/02, University of Oslo, 2002) 20.

<sup>104</sup> Government.no, *Jens Stoltenberg's First Government* (Web Page) <<https://www.regjeringen.no/en/the-government/previous-governments/regjeringer-siden-1814/historiske-regjeringer/governments-since-1945/jens-stoltenbergs-government-2000---2001/id438738/>>; Government.no, *Jens Stoltenberg's Second Government* (Web Page) <<https://www.regjeringen.no/en/the-government/previous-governments/regjeringer-siden-1814/historiske-regjeringer/governments-since-1945/jens-stoltenbergs-second-government/id449424/>>.

<sup>105</sup> S. Andresen and S. Hals Butenschøn, 'Nowegian Climate Policy: From Pusher to Laggard?' (2001) 1 *Law and Economics* 337, 348.

<sup>106</sup> Government.no, *Prime Minister's New Year's Address 2007* (Web Page, 01 January 2007) <<https://www.regjeringen.no/en/historical-archive/Stoltenbergs-2nd-Government/Office-of-the-Prime-Minister/taler-og-artikler/2007/new-years-address/id445669/>>.

<sup>107</sup> Norwegian Ministry of the Environment, Parliament of Norway, *Norwegian Climate Policy: Summary in English: Report No. 34 (2006-2007) to the Storting* (Report, 2006-2007) <[https://www.regjeringen.no/contentassets/c215be6cd2314c7b9b64755d629ae5ff/en-gb/pdfs/stm200620070034000en\\_pdfs.pdf](https://www.regjeringen.no/contentassets/c215be6cd2314c7b9b64755d629ae5ff/en-gb/pdfs/stm200620070034000en_pdfs.pdf)>.

<sup>108</sup> Robyn Eckersley, 'Poles Apart?: The Social Construction of Responsibility for Climate Change in Australia and Norway' (2013) 59(3) *Australian Journal of Politics and History* 382, 387.

When the Labour party came into power in 2013, electing Erna Solberg as the Prime Minister of Norway, she prioritised five areas of climate policy, to: (a) reduce emissions from the transport sector; (b) strengthen Norway's position as supplier of RE; (c) develop low-emission and clean production technology; (d) promote environmentally friendly ways in the shipping industry; and (e) promote CCS.<sup>109</sup>

The Solberg Government also re-established the Green Tax Commission in 2014<sup>110</sup> to evaluate environmental taxes to reduce GHGe. The Commission proposed that the non-EU ETS sectors should be subjected to some form of tax.<sup>111</sup> The Commission also noted that economic instruments play an important role in the development of environmental technology.<sup>112</sup>

#### *2.4.2 Phases of European Union Emissions Trading Scheme and Norwegian Emissions Trading Scheme Development*

##### *2.4.2(a) Phases of the European Union Emissions Trading Scheme*

In 1998, a Commission on Emission Allowances was established to analyse the ETS as a response to the *KP* emissions reduction requirements.<sup>113</sup> As a result, Norway developed a domestic ETS similar to the EU ETS. The Norwegian domestic ETS was subsequently linked to the EU ETS in order to fulfil Norway's emissions reduction targets. The EU ETS was developed in phases.

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<sup>109</sup> Norwegian Ministry of Climate and Environment, Parliament of Norway, *Status report as of January 2018 Norway's Seventh National Communication Under the Framework Convention on Climate Change* (Report, January 2018) 11  
<[http://unfccc.int/files/national\\_reports/annex\\_i\\_natcom/submitted\\_natcom/application/pdf/529371\\_norway-nc7-br3-1-nc7\\_-\\_br3\\_-\\_final.pdf](http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/529371_norway-nc7-br3-1-nc7_-_br3_-_final.pdf)>.

<sup>110</sup> Norwegian Ministry of Climate and Environment, Parliament of Norway, *Status report as of January 2018 Norway's Seventh National Communication Under the Framework Convention on Climate Change* (Report, January 2018) 78  
<[http://unfccc.int/files/national\\_reports/annex\\_i\\_natcom/submitted\\_natcom/application/pdf/529371\\_norway-nc7-br3-1-nc7\\_-\\_br3\\_-\\_final.pdf](http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/529371_norway-nc7-br3-1-nc7_-_br3_-_final.pdf)>.

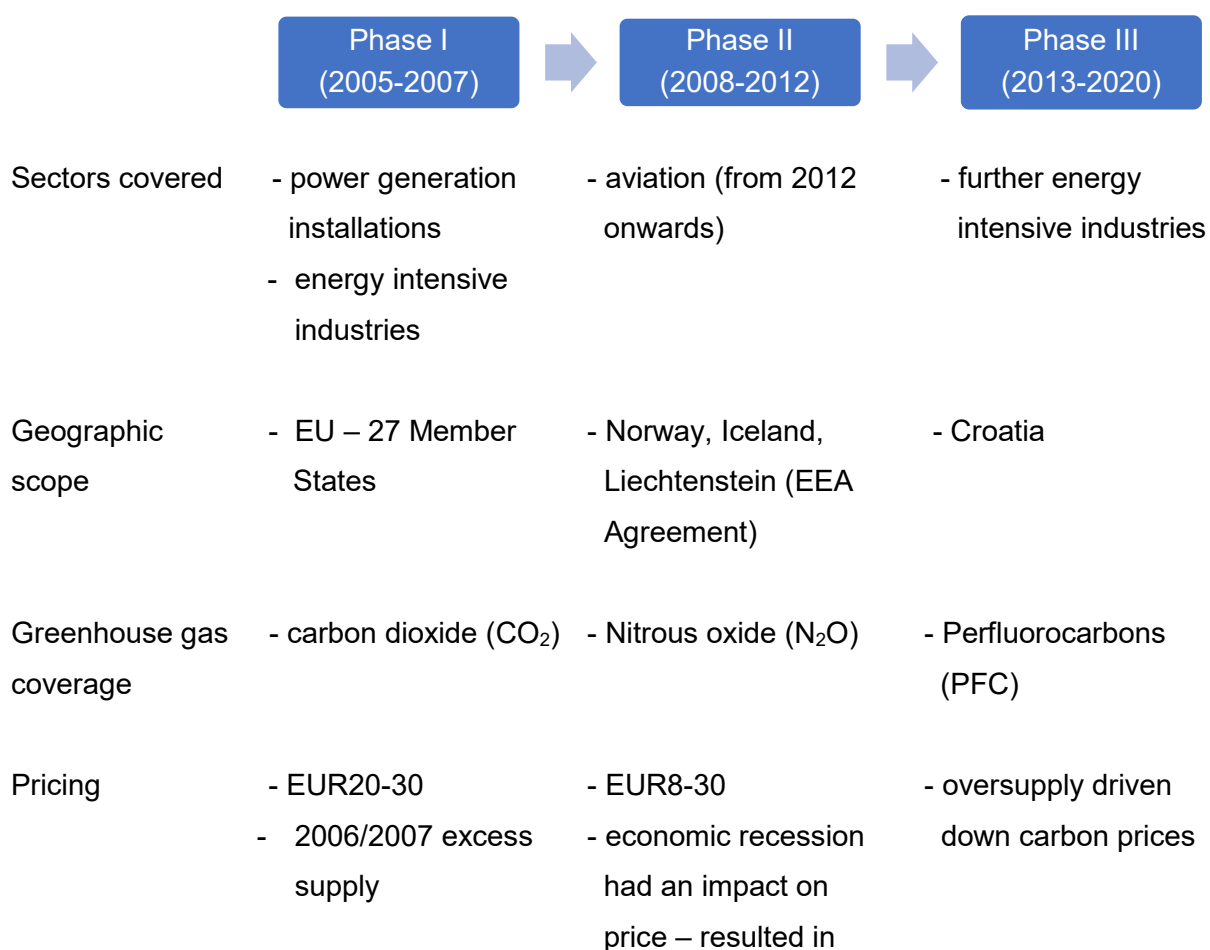
<sup>111</sup> Norwegian Ministry of Climate and Environment, Parliament of Norway, *Status report as of January 2018 Norway's Seventh National Communication Under the Framework Convention on Climate Change* (Report, January 2018) 78  
<[http://unfccc.int/files/national\\_reports/annex\\_i\\_natcom/submitted\\_natcom/application/pdf/529371\\_norway-nc7-br3-1-nc7\\_-\\_br3\\_-\\_final.pdf](http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/529371_norway-nc7-br3-1-nc7_-_br3_-_final.pdf)>.

<sup>112</sup> Norwegian Ministry of Climate and Environment, Parliament of Norway, *Status report as of January 2018 Norway's Seventh National Communication Under the Framework Convention on Climate Change* (Report, January 2018) 79  
<[http://unfccc.int/files/national\\_reports/annex\\_i\\_natcom/submitted\\_natcom/application/pdf/529371\\_norway-nc7-br3-1-nc7\\_-\\_br3\\_-\\_final.pdf](http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/529371_norway-nc7-br3-1-nc7_-_br3_-_final.pdf)>.

<sup>113</sup> P. Muller & P. Slominski, 'Theorizing third country agency in EU rule transfer: linking the EU Emission Trading System with Norway, Switzerland and Australia' (2016) 23(6) *Journal of European Public Policy* 814, 821 citing Holten, T. (2011) 'Actors, interests and values. The Norwegian Emissions Trading System from and institutional perspective', unpublished master theses, Norwegian University of Life Sciences.

*Directive 2003/87/EC* established a scheme for the EU's emissions trading.<sup>114</sup> This Directive targeted large industrial emitters from 2005. The goal of the EU ETS is to reduce GHGs in a cost effective and economic manner.<sup>115</sup> The recent Directive on the EU ETS is *Directive 2018/410/EC* which came into force on 8 April 2018.<sup>116</sup> The adoption of Directives over the years explains the development of ETS in phases.

This ETS was the first EU ETS introduced, comprising two phases: Phase I (the preparatory phase) from 2005-2007, and Phase II from 2008-2012.<sup>117</sup> Subsequently, Phase III (2013-2020) was developed and is currently moving towards Phase IV.

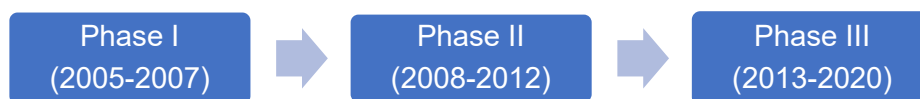


<sup>114</sup> S. Kallbekken, 'The Cost of Sectoral Differentiation: The Case of the EU Emissions Trading Scheme' (CICERO Working Paper 2004:08, CICERO, September 2004) 3 <[https://pub.cicero.oslo.no/cicero-xmlui/bitstream/handle/11250/192314/CICERO\\_Working\\_Paper\\_2004-08.pdf?sequence=1&isAllowed=y](https://pub.cicero.oslo.no/cicero-xmlui/bitstream/handle/11250/192314/CICERO_Working_Paper_2004-08.pdf?sequence=1&isAllowed=y)>.

<sup>115</sup> *Directive 2003/87/EC* art 1.

<sup>116</sup> European Commission, *Revision for Phase 4 (2021-2030)* (Web Page) <[https://ec.europa.eu/clima/policies/ets/revision\\_en](https://ec.europa.eu/clima/policies/ets/revision_en)>.

<sup>117</sup> S. Kallbekken, 'The Cost of Sectoral Differentiation: The Case of the EU Emissions Trading Scheme' (CICERO Working Paper 2004:08, CICERO, September 2004) 3.



gradual decrease in price

Allowances	- free allocation	- mainly free allocation (10% auctioned) - no harmonised method of distributing allowances	- ½ of total allowances auctioned - free allowances distributed via harmonised benchmarks
Penalty for non-compliance	- EUR40 per tonne	- EUR100 per tonne	- penalty rate will be increased from the earlier phase according to the European index of consumer prices
Trade	- permitted	- permitted	- permitted
Acquittal	- EU ETS permits must be surrendered to the regulator (acquitted) after emitting GHGe	- same	- same

#### 2.4.2(a)(i) Phase I of European Union Emissions Trading Scheme (2005-2007)

Phase I was the pilot phase where most emissions allowances were given out for free. Up to 5% of emission allowances were auctioned in Phase I which increased to 10% during Phase II.<sup>118</sup> Member States had to prepare a National Action Plan (NAP) stating the amount of EU emissions allowances to be granted. These NAPs were assessed by the Commission,

<sup>118</sup> Directive 2003/87/EC art 10; European Commission, 'EU ETS Handbook' (European Union, 2015) 28.

which approved the number of allowances to be allocated based on the criteria in the EU ETS Directive.

Despite drawbacks, Phase I established a price for carbon and a system for monitoring, reporting and verifying emissions. As there was no proper emissions data available, too many allowances were allocated, leading to an oversupply which contributed to a significant drop in allowance prices. The lessons learnt from Phase I's failures helped to improve the process in Phase II.

#### *2.4.2(a)(ii) Phase II of European Union Emissions Trading Scheme (2008-2012)*

The EU ETS made several alterations to the scheme's design, after moving out from the pilot phase. The scheme was tightened by giving power to the European Commission to reject or modify the NAPs and increasing the number of allowances to be auctioned. In the second Phase, about 10% of allowances were auctioned.<sup>119</sup> The aviation sector and nitrous oxide emissions from the production of nitric acid were included in this Phase. The EU ETS was also expanded in this Phase to include Norway, Iceland and Liechtenstein.

#### *2.4.2(a)(iii) Phase III of European Union Emissions Trading Scheme (2013-2020)*

In Phase III, an EU wide cap was developed and refined to a system using the linear reduction factor. This cap was set to reduce the total amount of allowances issued per year. The rules on allocation of allowances became stricter in this phase onwards. As a result, rules for allowance allocation and auctioning were also introduced.<sup>120</sup> Phase III became more stringent in its allocation of allowances as most were auctioned: 57% of allowances were auctioned and the balance of allowances were allocated for free.<sup>121</sup> Further, sector coverage was expanded to include perfluorocarbons (PFC).

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<sup>119</sup> European Commission, *Phases 1 and 2 (2005-2012)* (Web Page) <[https://ec.europa.eu/clima/policies/ets/pre2013\\_en](https://ec.europa.eu/clima/policies/ets/pre2013_en)>.

<sup>120</sup> *Directive 2003/87/EC* art 9 and 10.

<sup>121</sup> International Carbon Action Partnership, 'EU Emissions Trading System (EU ETS)', (Web Page, 08 January 2020) 3 <[https://icapcarbonaction.com/en/?option=com\\_etsmap&task=export&format=pdf&layout=list&system%5B%5D=43](https://icapcarbonaction.com/en/?option=com_etsmap&task=export&format=pdf&layout=list&system%5B%5D=43)>.



#### 2.4.2(a)(iv) Phase IV of European Union Emissions Trading Scheme (2021-2030)

In Phase IV, the annual reduction factor is increased by 2.2% in line with the 2030 targets.<sup>122</sup> There are no changes made to the sectors and greenhouse gases covered under the EU ETS in this phase. Further, the use of offsets and credits is not expected in this phase.<sup>123</sup>

#### 2.4.2(b) History of the European Union Emissions Trading Scheme

Before the EU ETS was developed, a 'burden sharing' agreement was adopted in 1998.<sup>124</sup> This agreement divided responsibilities between Member States to meet the EU's 8% emissions reduction target under the *KP*.<sup>125</sup> After a series of negotiations, the Effort Sharing Decision (ESD) was introduced, operating between 2013 and 2020, which replaced the 'burden sharing' agreement that operated from 1998.<sup>126</sup> This instrument aims to reduce emissions by 10% by 2020 and 30% by 2030<sup>127</sup> in the sectors not covered by the EU ETS and

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<sup>122</sup> European Commission, *Emissions Cap and Allowances* (Web Page) <[https://ec.europa.eu/clima/policies/ets/cap\\_en](https://ec.europa.eu/clima/policies/ets/cap_en)>.

<sup>123</sup> International Carbon Action Partnership, 'EU Emissions Trading System (EU ETS)', (Web Page, 08 January 2020) 4 <[https://icapcarbonaction.com/en/?option=com\\_etsmap&task=export&format=pdf&layout=list&system%5B%5D=43](https://icapcarbonaction.com/en/?option=com_etsmap&task=export&format=pdf&layout=list&system%5B%5D=43)>.

<sup>124</sup> R. K. W. Wurzel, James Connelly and Duncan Liefferink (eds), *The European Union in International Climate Change Politics*, (Routledge, 2016) 6.

<sup>125</sup> R. K. W. Wurzel et al (eds), *The European Union in International Climate Change Politics*, (Routledge, 2016) 39.

<sup>126</sup> R. K. W. Wurzel et al (eds), *The European Union in International Climate Change Politics*, (Routledge, 2016) 7; E. Elvemo Myhrer, 'Policy Entrepreneurship Curbed by Member State Preferences: DG Climate Action and the Effort Sharing Policy' (CICERO Report 2018:10, CICERO, 11 July 2018) 7 <<https://pub.cicero.oslo.no/cicero-xmlui/bitstream/handle/11250/2508224/CICERO%20Report%202018%2010%20web.pdf?sequence=1&isAllowed=y>>; European Commission, *Implementation of the Effort Sharing Decision* (Web Page) <[https://ec.europa.eu/clima/policies/effort/implementation\\_en](https://ec.europa.eu/clima/policies/effort/implementation_en)>.

<sup>127</sup> *Decision No. 406/2009/EC of the European Parliament and of the Council on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020 art 1; Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) 525/2013 art 1.*

the non-EU ETS sectors.<sup>128</sup> These sectors include transport, buildings, agriculture, and waste.<sup>129</sup> The Effort Sharing Regulation (EU) 2018/842<sup>130</sup> was adopted in May 2018.<sup>131</sup>

In the early 1990s, the European Commission proposed to introduce a carbon tax. However, due to strong opposition from the fossil fuel industry and key Member States, the focus shifted to an ETS.<sup>132</sup> The proposal was withdrawn by the European Commission in 2001<sup>133</sup> as the EU was sceptical about introducing an international ETS. Many issues were considered before the EU ETS was adopted: (a) targets/caps; (b) sector coverage; (c) allocation of allowances; and (d) linking with other systems.<sup>134</sup>

There are a number of factors that contributed to the establishment of the EU ETS:

- (1) the *Single European Act 1986 (SEA 1986)* and concept of the European common market;
- (2) unfavourable content and political fallout of the *KP*;
- (3) actions taken by the EU Member States (i.e. in introducing their own environmental taxes and trading schemes); and
- (4) acceptable design of the EU ETS which gained support from the EU Government, industry and non-government organisations.<sup>135</sup>

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<sup>128</sup> European Commission, *Effort Sharing: Member States' Emission Targets* (Web Page) <[https://ec.europa.eu/clima/policies/effort\\_en](https://ec.europa.eu/clima/policies/effort_en)>.

<sup>129</sup> European Commission, *Effort Sharing: Member States' Emission Targets* (Web Page) <[https://ec.europa.eu/clima/policies/effort\\_en](https://ec.europa.eu/clima/policies/effort_en)>.

<sup>130</sup> *Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013 [2018] OJ L 156/26 ('Regulation 2018/842')*.

<sup>131</sup> European Commission, *Effort Sharing 2021-2030: Targets and Flexibilities* (Web Page) <[https://ec.europa.eu/clima/policies/effort/proposal\\_en](https://ec.europa.eu/clima/policies/effort/proposal_en)>; According to *Regulation (EU) 2018/342 of the European Parliament and of the Council* art 2(1), this Regulation applies to GHGe from 'IPCC sources of energy, industrial processes and product use, agriculture and waste as determined pursuant to Regulation (EU) No. 525/2013, excluding greenhouse gas emissions from the activities listed in Annex I to Directive 2003/87/EC.' A EU Regulation is a legally binding legislative Act for all Member States.

<sup>132</sup> A. T. Gullberg, 'The European Electricity Sector and the EU ETS Review' (CICERO Working Paper 2008:01, CICERO, March 2008) 1 <[https://pub.cicero.oslo.no/cicero-xmlui/bitstream/handle/11250/192282/CICERO\\_Working\\_Paper\\_2008-01.pdf?sequence=1&isAllowed=y](https://pub.cicero.oslo.no/cicero-xmlui/bitstream/handle/11250/192282/CICERO_Working_Paper_2008-01.pdf?sequence=1&isAllowed=y)>.

<sup>133</sup> S. Speck et al, *The Use of Economic Instruments in Nordic and Baltic Environmental Policy 2001-2005* (TemaNord, 2006) 33 <<http://norden.diva-portal.org/smash/get/diva2:701846/FULLTEXT01.pdf>>.

<sup>134</sup> P. Markussen and G.T. Svendsen, 'Industry Lobbying and the Political Economy of GHG Trade in the European Union' (2005) 33(2) *Energy Policy* 245, 247.

<sup>135</sup> A. Denny Ellerman, Frank J. Convery and Christian De Perthuis, *Pricing Carbon: The European Union Emissions Trading Scheme* (Cambridge University Press, 2010) 29-30.

The *SEA 1986* added new momentum to European integration and the completion of an internal market, which formed the institutional and economic basis for the EU ETS.<sup>136</sup> The key institutions involved in legislating to establish the EU ETS are the European Parliament, the European Commission, and the European Council.<sup>137</sup> The European Parliament and Council can amend the legislative proposal<sup>138</sup> and approve any legislation concerning the EU ETS.<sup>139</sup>

The European Commission has the power to initiate any legislative proposals or amendments with regard to the EU ETS and its relevant Directives,<sup>140</sup> and ensures that Member States implement the legislation. Member States who fail to comply with the legislation may face infringement proceedings brought by the European Commission.<sup>141</sup> The European Commission determines the proceedings and can also impose sanctions for non-compliance by the Member States.

The EU ETS journey has been on a 'rocky road' so far.<sup>142</sup> It was a 'product of two failures': (1) the Commission's failure to gain European support for introducing a carbon tax; and (2) the failure of the parties to the *UNFCCC* to include favourable policy initiatives in the *KP*.<sup>143</sup> Zeben characterises the EU ETS as a 'multi-level regulatory tool',<sup>144</sup> because the functioning of the EU ETS is dependent on the cooperation of regulators at different levels of governance.<sup>145</sup>

The next section discusses the development of the Norwegian ETS before it was linked to the EU ETS.

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<sup>136</sup> Eur-Lex, *The Single European Act* (Web Page, 04 April 2018) <<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM:xy0027>>.

<sup>137</sup> European Union, *EU Institutions and Bodies in Brief* (Web Page) <[https://europa.eu/european-union/about-eu/institutions-bodies\\_en](https://europa.eu/european-union/about-eu/institutions-bodies_en)>.

<sup>138</sup> European Commission, 'EU ETS Handbook' (European Union, 2015) 9.

<sup>139</sup> European Commission, 'EU ETS Handbook' (European Union, 2015) 9.

<sup>140</sup> European Commission, 'EU ETS Handbook' (European Union, 2015) 9.

<sup>141</sup> European Commission, 'EU ETS Handbook' (European Union, 2015) 11.

<sup>142</sup> T. Laing et al, 'Assessing the Effectiveness of the EU Emissions Trading System' (Grantham Research Institute on Climate Change and the Environment Working Paper No. 126, UK, 2013) 2 <<http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2014/02/WP106-effectiveness-eu-emissions-trading-system.pdf>>.

<sup>143</sup> A. D. Ellerman et al, *Pricing Carbon: The European Union Emissions Trading Scheme* (Cambridge University Press, 2010) 16.

<sup>144</sup> J. V. Zeben, *The Allocation of Regulatory Competence in the EU Emissions Trading Scheme* (Cambridge University Press, 2014) 5.

<sup>145</sup> J. V. Zeben, *The Allocation of Regulatory Competence in the EU Emissions Trading Scheme* (Cambridge University Press, 2014) 5.

### *2.4.3 Development of the Norwegian Domestic Emissions Trading Scheme*

The Norwegian ETS and the EU ETS have similar development phases: Phase I (2005-2007), Phase II (2008-2012) and Phase III (2013-2020),<sup>146</sup> and also has similar features because the domestic ETS was intentionally designed to be compatible with the EU ETS.<sup>147</sup> One notable difference between the Norwegian ETS and EU ETS is that Norwegian installations which paid CO<sub>2</sub> tax were not under the ETS during Phase I (2005-2007).<sup>148</sup> During Phase I, Norway developed its domestic ETS separately as a pilot phase before it was integrated with the EU ETS.

The oil and gas industry in Norway is subjected to the carbon tax as well as the ETS- 'double regulation'.<sup>149</sup> When offshore petroleum installations were also subjected to the Norwegian ETS, tax rates were reduced to compensate for the increasing cost.<sup>150</sup> The concept of 'double regulation' is discussed further in section 3.3.2.

### *2.5 Key Features of the European Union Emissions Trading Scheme and the Norwegian Emissions Trading Scheme*

This section discusses the key features of the EU ETS and the Norwegian ETS comprising of targets/cap, sector coverage, allocation of allowances, and ability to mix with other instruments (i.e linking).

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<sup>146</sup> Environmental Defense Fund, *Norway The World's Carbon Markets: A Case Study Guide to Emissions Trading* (Web Page, May 2013) 1  
<[https://www.edf.org/sites/default/files/EDF\\_IETA\\_Norway\\_Case\\_Study\\_May\\_2013.pdf](https://www.edf.org/sites/default/files/EDF_IETA_Norway_Case_Study_May_2013.pdf)>.

<sup>147</sup> Environmental Defense Fund, *Norway The World's Carbon Markets: A Case Study Guide to Emissions Trading* (Web Page, May 2013) 1  
<[https://www.edf.org/sites/default/files/EDF\\_IETA\\_Norway\\_Case\\_Study\\_May\\_2013.pdf](https://www.edf.org/sites/default/files/EDF_IETA_Norway_Case_Study_May_2013.pdf)>.

<sup>148</sup> Norwegian Ministry of the Environment, Parliament of Norway, *Norway's Report on Demonstrable Progress Under the Kyoto Protocol Status Report as of December 2005* (Report, 2005) 8  
<<https://unfccc.int/resource/docs/dpr/nor1.pdf>>.

<sup>149</sup> Catherine Banet, 'Effectiveness in Climate Regulation: Simultaneous Application of a Carbon Tax and an Emissions Trading Scheme to the Offshore Petroleum Sector in Norway' (2017) 11(1) *Carbon and Climate Law Review* 25, 35.

<sup>150</sup> Environmental Defense Fund, *Norway The World's Carbon Markets: A Case Study Guide to Emissions Trading* (Web Page, May 2013) 4  
<[https://www.edf.org/sites/default/files/EDF\\_IETA\\_Norway\\_Case\\_Study\\_May\\_2013.pdf](https://www.edf.org/sites/default/files/EDF_IETA_Norway_Case_Study_May_2013.pdf)>.

## 2.5.1 Key Features of the European Union Emissions Trading Scheme

### 2.5.1(a) Targets/Cap

The EU committed to reduce CO<sub>2</sub> emissions by at least 20% by 2020 (the 20:20:20 goal) compared to 1990 levels, and by at least 40% by 2030.<sup>151</sup> This target led to the introduction of legislation aiming to reduce GHGe including: (a) revision of the EU ETS,<sup>152</sup> (b) Effort Sharing Agreement for the non-ETS sectors, (c) RE targets, and (d) CCS.<sup>153</sup>

The EU ETS was created to reach the above-mentioned emissions reduction target, and to fulfil its *KP* commitments. The design of the EU ETS was 'Kyoto compatible'.<sup>154</sup> It was the major climate policy instrument of the EU; the EU did not have a carbon tax instrument like Norway prior to the ETS. The objectives of the EU ETS were set out in *Directive 2003/87/EC* art 1 and amended in the *Directive 2018/410/EC* as establishing a 'system for greenhouse gas emission allowance trading within the Union, in order to promote reductions of greenhouse gas emissions in a cost-effective and economically efficient manner.'

The EU ETS, the world's largest transboundary cap and trade system, began operation in 2005. It was the centrepiece of the EU's climate policies, with an emissions cap and trading of EU emissions allowances. One of the main objectives of the EU ETS is to efficiently reduce GHGe and promote investment in low carbon technologies.<sup>155</sup> It covers 45% of CO<sub>2</sub> emissions in the EU<sup>156</sup> and 12,000 large energy intensive installations.<sup>157</sup>

According to the European Commission, the EU ETS is based on six fundamental principles: (a) cap and trade system; (b) focus on large CO<sub>2</sub> emitters; (c) implementation of

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<sup>151</sup> European Commission, 'The EU Emissions Trading System (EU ETS)' (Web Page) 2 <[https://ec.europa.eu/clima/sites/clima/files/factsheet\\_ets\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/factsheet_ets_en.pdf)>.

<sup>152</sup> *Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community* [2009] OJ L 140/63 ('*Directive 2009/29/EC*').

<sup>153</sup> *Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide and amending Council Directive 85/337/EEC, European Parliament and Council Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC, 2008/1/EC and Regulation (EC) No 1013/2006* [2009] OJ L 140/114 ('*Directive 2009/31/EC*').

<sup>154</sup> Zahar, Peel and Godden, *Australian Climate Law in Global Context* (Cambridge University Press, 2013) 178.

<sup>155</sup> T. Laing, M. Sato, M. Grubb and C. Combetti, 'Assessing the Effectiveness of the EU Emissions Trading System' (Grantham Research Institute on Climate Change and the Environment Working Paper No. 126, UK, 2013) 2.

<sup>156</sup> KonKraft, 'Climate and The Norwegian Continental Shelf KonKraft Report No. 2016-2' (Web Page) 27 <[http://konkraft.no/wp-content/uploads/2016/08/Klimarapport\\_engelsk\\_komprimert\\_web.pdf](http://konkraft.no/wp-content/uploads/2016/08/Klimarapport_engelsk_komprimert_web.pdf)>.

<sup>157</sup> A. T. Gullberg, 'The European Electricity Sector and the EU ETS Review' (CICERO Working Paper 2008:01, CICERO, March 2008) 1.

the scheme in phases; (d) allocation of allowances updated periodically; (e) a strong compliance framework; and (f) linking of the allowance market with compatible trading schemes in other countries.<sup>158</sup>

The EU ETS targets heavy emitters by setting a cap or a limit on emissions which is tightened over time to reduce emissions. These limits are reduced over time following the linear reduction factor (LRF). In Phase III, the cap reduces by a LRF of 1.74% each year of the total amount of allowances issued.<sup>159</sup> The main difference between Phase III and the two earlier phases is the introduction of an EU wide cap which is annually reduced by a LRF, replacing the previous system of national caps.<sup>160</sup>

In Phase IV, the annual reduction factor is 2.2%, in line with the 2030 targets.<sup>161</sup> The sectors under this Phase of the EU ETS must reduce their emissions by '43% compared to 2005 levels'.<sup>162</sup> The less the installations emit, the less they pay for their emissions. The EU ETS encourages the emitters to emit less and innovate more. The authors Skjaerseth and Wettestad state that the logic behind the EU ETS is to create monetary incentives by being able to buy and sell allowances and make a profit, thus achieving the optimal result of reducing emissions.<sup>163</sup>

Currently, there is negotiation on a bilateral agreement between the Member States for a collective delivery with the EU, meaning joint fulfilment of climate goals for 2030. This measure would allow for flexibility in compliance also within the non-ETS sectors. Joint fulfilment would allow the achievement of the 2030 reduction target for emissions that fall outside the scope of the EU ETS with the use of flexibility mechanisms as necessary, in addition to domestic emission reductions.

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<sup>158</sup> European Commission, 'EU Action Against Climate Change: EU Emissions Trading – An Open Scheme Promoting Global Innovation' (Web Page) 6  
<<https://ec.europa.eu/environment/pdfs/2007/pub-2007-015-en.pdf>>.

<sup>159</sup> European Commission, *Emissions Cap and Allowances* (Web Page)  
<[https://ec.europa.eu/clima/policies/ets/cap\\_en](https://ec.europa.eu/clima/policies/ets/cap_en)>.

<sup>160</sup> European Commission, *EU Emissions Trading System* (Web Page)  
<[https://ec.europa.eu/clima/policies/ets\\_en](https://ec.europa.eu/clima/policies/ets_en)>.

<sup>161</sup> European Commission, *Emissions Cap and Allowances* (Web Page)  
<[https://ec.europa.eu/clima/policies/ets/cap\\_en](https://ec.europa.eu/clima/policies/ets/cap_en)>.

<sup>162</sup> European Commission, *Revision for Phase 4 (2021-2030)* (Web Page)  
<[https://ec.europa.eu/clima/policies/ets/revision\\_en](https://ec.europa.eu/clima/policies/ets/revision_en)>.

<sup>163</sup> J.B. Skjaerseth and J. Wettestad, *EU Emissions Trading Initiation, Decision-making and Implementation* (Ashgate, 2008) 2.

### 2.5.1(b) Sector Coverage

About 11,500 installations were covered in Phase I.<sup>164</sup> Different sectors have different emissions reduction commitments. Activities included in the scheme are energy activities, production and processing of ferrous metals, mineral activities and activities producing paper and pulp.<sup>165</sup>

The Commission of the European Communities chose to limit the coverage of the ETS to keep it simple and minimise distortions in the market. The Commission explained the reason for not including certain sectors such as the chemical sector and waste incineration sectors in the explanatory memorandum:<sup>166</sup> First, because the CO<sub>2</sub> emissions are less significant and, second, as there is a high number of chemical installations, it would be complex to include it.<sup>167</sup>

The Directive only covered CO<sub>2</sub> emissions in the first phase.<sup>168</sup> This is because CO<sub>2</sub> accounted for a large amount of GHGe. The Directive was limited to CO<sub>2</sub> to ensure proper monitoring of emissions.<sup>169</sup> The list was then expanded to cover other greenhouse gases besides carbon dioxide, including methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride.<sup>170</sup>

In 2009, a Directive<sup>171</sup> was passed extending the EU ETS. It was applied to Phase III of the EU ETS.<sup>172</sup> *Directive 2009/29/EC* introduced three main changes: (1) the EU ETS was extended to cover further industries (i.e. petrochemical, aluminium and ammonia sectors) and

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<sup>164</sup> P.E.G. Medina, 'Climate Change Mitigation: A Carbon Tax or An Emissions Trading Scheme? An Analysis of the Norwegian Perspective' (Master Thesis, Norwegian School of Economics Bergen, 2013) 26.

<sup>165</sup> Annex I of *Directive 2003/87/EC*.

<sup>166</sup> Commission of the European Communities, 'Proposal for a Directive of the European Parliament and of the Council establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC: Explanatory Memorandum' (Web Page) 10 <<http://ec.europa.eu/transparency/regdoc/rep/1/2001/EN/1-2001-581-EN-F1-1.Pdf>>.

<sup>167</sup> Commission of the European Communities, 'Proposal for a Directive of the European Parliament and of the Council establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC: Explanatory Memorandum' (Web Page) 10 <<http://ec.europa.eu/transparency/regdoc/rep/1/2001/EN/1-2001-581-EN-F1-1.Pdf>>.

<sup>168</sup> S. Kallbekken, 'The Cost of Sectoral Differentiation: The Case of the EU Emissions Trading Scheme' (CICERO Working Paper 2004:08, CICERO, September 2004) 3.

<sup>169</sup> Commission of the European Communities, 'Proposal for a Directive of the European Parliament and of the Council establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC: Explanatory Memorandum' (Web Page) 9 <<http://ec.europa.eu/transparency/regdoc/rep/1/2001/EN/1-2001-581-EN-F1-1.Pdf>>.

<sup>170</sup> *Directive 2003/87/EC* Annex II.

<sup>171</sup> *Directive 2009/29/EC*.

<sup>172</sup> *Directive 2009/29/EC* was passed amending *Directive 2003/87/EC*.

gases (nitrous oxide and perfluorocarbons); (2) EU emission permit ceilings were introduced which decreases every year during Phase III; and (3) higher percentage of allowances allocated through auctions.<sup>173</sup>

### *2.5.1(c) Allocation of Allowances*

The installations in the EU ETS have to possess an emission allowance permit equivalent to their emissions. One emission allowance gives the right to emit one tonne of CO<sub>2</sub>. These emission allowances are the EU ETS currency.<sup>174</sup> The EU allocates allowances to the Member States, which are then allocated by each Member State for free or by an auction carried out on a common platform where companies can buy their permits. In Phase I, about 95% of the allowances were allocated free of charge and this was reduced in Phase II. The allocation of allowances is stated in the NAP of each country.

Every Member State has to develop a NAP indicating the quantity of allowances that it intends to allocate for that period.<sup>175</sup> The Directive provides 11 points on the development of NAPs.<sup>176</sup> This plan will then be reviewed by the Committee and will be approved or rejected.<sup>177</sup> The emission allowances issued will only be valid for the particular trading period.<sup>178</sup> The allowances that are invalid, not surrendered or cancelled, will be cancelled by the authority.<sup>179</sup> These allowances do not disappear as they are replaced with allowances issued for the subsequent trading periods.<sup>180</sup>

Each year, installations have to submit an emissions report.<sup>181</sup> Their emissions need to match the allowances they have. Installations that do not surrender sufficient allowances to cover their emissions faces an excess emissions penalty.<sup>182</sup> In Phase I, the penalty was €40

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<sup>173</sup> S. Borghesi, *The European Emission Trading Scheme and Renewable Energy Policies: Credible Targets for Incredible Results?* (Nota Di Lavoro, 141.2010) 13  
<<https://ageconsearch.umn.edu/record/98099/files/NDL2010-141.pdf>>.

<sup>174</sup> European Commission, 'The EU Emissions Trading System (EU ETS)' (Web Page) 2  
<[https://ec.europa.eu/clima/sites/clima/files/factsheet\\_ets\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/factsheet_ets_en.pdf)>.

<sup>175</sup> *Directive 2003/87/EC* art 9(1).

<sup>176</sup> *Directive 2003/87/EC* Annex III.

<sup>177</sup> *Directive 2003/87/EC* art 9(3); *Directive 2003/87/EC* art 23(1).

<sup>178</sup> *Directive 2003/87/EC* art 13(1).

<sup>179</sup> *Directive 2003/87/EC* art 13(2).

<sup>180</sup> *Directive 2003/87/EC* art 13(2).

<sup>181</sup> *Directive 2003/87/EC* art 14.

<sup>182</sup> *Directive 2003/87/EC* art 16(3).



for each tonne of CO<sub>2</sub> emitted by the installation for which it did not surrender sufficient allowances.<sup>183</sup> This was subsequently increased to €100.<sup>184</sup>

Only certain industries receive free allowances, as they emit more CO<sub>2</sub> compared to others by way of production. This is done to maintain fairness and to encourage these sectors to invest in cleaner and less polluting technologies. If an installation has more allowances, it can sell these allowances to others which require it or keep it for the future.<sup>185</sup> Companies can buy and sell units within the overall cap.

After the launch of Phase I, the price of emission allowances increased; the power sector was buying a high volume of emission allowances to cover their emissions. In 2007, the price of allowances dropped significantly as there was a surplus of allowances. This was due to over-allocation of allowances which was said to be the drawback of the EU ETS. The price volatility was also due to the economic recession which brought decreased demand for allowances as a result of reduced output in the energy intensive sectors. The goal of the EU ETS is to move towards 100% auctioning to make the system fair, transparent, and efficient.

The EU emissions allowance prices changed significantly in the first 10 years of the EU ETS. There was a point when the emissions allowance price was €0.10, at the end of Phase I in 2007.<sup>186</sup> The EU emissions allowance prices also dipped in Phase II of the EU ETS.<sup>187</sup> Subsequently, it started to recover from 2014 and to date, it stands at about €25-26.<sup>188</sup>

The Union Registry administers the EU ETS allowances accounts.<sup>189</sup> It covers all 31 countries participating in the EU ETS. Companies or individuals must open an account in the Union Registry in order to participate in the EU ETS. The European Union Transaction Log (EUTL) checks, records, and authorises the transactions between accounts in the Union

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<sup>183</sup> *Directive 2003/87/EC* art 16(4).

<sup>184</sup> *Directive 2003/87/EC* art 16(3).

<sup>185</sup> European Commission, *EU Emissions Trading System (EU ETS)* (Web Page) <[https://ec.europa.eu/clima/policies/ets\\_en](https://ec.europa.eu/clima/policies/ets_en)>.

<sup>186</sup> A. D. Ellerman et al, 'The European Union Emissions Trading System: Ten Years and Counting' (2016) 10(1) *Review of Environmental Economics and Policy* 89, 98-99.

<sup>187</sup> A. D. Ellerman et al, 'The European Union Emissions Trading System: Ten Years and Counting' (2016) 10(1) *Review of Environmental Economics and Policy* 89, 98-99.

<sup>188</sup> European Energy Exchange, *European Emissions Allowances* (Web Page) <<https://www.eex.com/en/market-data/environmental-markets/spot-market/european-emission-allowances#!/2019/06/19>>.

<sup>189</sup> European Commission, *Union Registry* (Web Page) <[https://ec.europa.eu/clima/policies/ets/registry\\_en](https://ec.europa.eu/clima/policies/ets/registry_en)>.

Registry.<sup>190</sup> Participation in the scheme is mandatory for installations that fall under Annex I of the *Directive 2003/87/EC*. However, installations were allowed to opt-out during the preparatory phase.<sup>191</sup> Further, Member States can include installations into the EU ETS.<sup>192</sup>

The auctioning of allowances is governed by the Auctioning Regulation, *Commission Regulation (EU) No. 1031/2010 of 12<sup>th</sup> November 2010*.<sup>193</sup> This Regulation sets out the timing, administration matters, and other aspects of auctioning of allowances pursuant to Directive 2003/87/EC.<sup>194</sup> *Regulation No. 1031/2010* was amended by the *Commission Regulation (EU) No. 1210/2011 of 23<sup>rd</sup> November 2011*.

There are two auctioning platforms in place: (a) the European Energy Exchange, and (b) the ICE Futures Europe.<sup>195</sup> Auctioning undertaken in Phase III is either through the common auction platform or through an 'opt-out' platform. Member States can choose to opt-out from the common platform and appoint their own platform.<sup>196</sup> Some countries (i.e. German, Poland and United Kingdom) have decided to do so.

### *2.5.1(c)(i) Surplus of Emission Allowances*

Since 2009, there has been a surplus of emission allowances, mainly due to the economic crisis and high imports of international credits.<sup>197</sup> This situation resulted in lower carbon prices. To address this issue, the auction volume of allowances was reduced by the European Commission (i.e. due to 'back-loading' of allowances).<sup>198</sup> The 'back-loading'

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<sup>190</sup> European Commission, *Union Registry* (Web Page)

<[https://ec.europa.eu/clima/policies/ets/registry\\_en](https://ec.europa.eu/clima/policies/ets/registry_en)>.

<sup>191</sup> *Directive 2003/87/EC* art 27.

<sup>192</sup> *Directive 2003/87/EC* art 24.

<sup>193</sup> Emissions-EUETS, *EU ETS Auctioning Regulation* (Web Page) <<https://www.emissions-euets.com/auctioning-regulation>>.

<sup>194</sup> *Commission Regulation (EU) No. 1031/2010* art 1.

<sup>195</sup> European Commission, *Auctioning* (Web Page) <[https://ec.europa.eu/clima/policies/ets/auctioning\\_en](https://ec.europa.eu/clima/policies/ets/auctioning_en)>.

<sup>196</sup> European Commission, *Auctioning* (Web Page) <[https://ec.europa.eu/clima/policies/ets/auctioning\\_en](https://ec.europa.eu/clima/policies/ets/auctioning_en)>.

<sup>197</sup> European Commission, *Market Stability Reserve* (Web Page) <[https://ec.europa.eu/clima/policies/ets/reform\\_en](https://ec.europa.eu/clima/policies/ets/reform_en)>.

<sup>198</sup> European Commission, *Market Stability Reserve* (Web Page) <[https://ec.europa.eu/clima/policies/ets/reform\\_en](https://ec.europa.eu/clima/policies/ets/reform_en)>. 'Back-loading' is where the auctioning of allowances was delayed. It is done to remove the surplus of allowances. Source: European Parliament, 'Reform of the EU Carbon Market: From Backloading to the Market Stability Reserve', (Web Page, October 2014) <[http://www.europarl.europa.eu/RegData/etudes/BRIE/2014/538951/EPRS\\_BRI\(2014\)538951\\_REV1\\_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/BRIE/2014/538951/EPRS_BRI(2014)538951_REV1_EN.pdf)>.

measure was introduced to rebalance the supply and demand of allowances.<sup>199</sup> A Market Stability Reserve (MSR) was introduced in early 2019 to manage the surplus of allowances and adjust the supply of allowances to be auctioned.<sup>200</sup>

### *2.5.1(c)(ii) Benchmarking Allocation*

Ellerman, Convery, and Perthuis are of the view that benchmarking allocation is essential to the EU ETS.<sup>201</sup> Benchmarking allocation can penalise energy-inefficient producers with high emissions and reward the ones emitting less being energy-efficient.<sup>202</sup> However, benchmarking allocation was not adopted in the EU ETS due to: (1) poor data collection and impossible deadlines, (2) different types of goods produced and different types of processes involved, and (3) no existing standard and legal support to impose the benchmark.<sup>203</sup>

### *2.5.1(d) Linking with Other Systems*

An opportunity is provided by the Directive to link other greenhouse gas trading schemes with the EU ETS.<sup>204</sup> In 2008, the Norwegian ETS was integrated with the EU ETS.<sup>205</sup> This move gained wide Parliamentary and industry (oil and gas) support. In order to be linked with the EU ETS, certain conditions have to be met, which include: (1) ensuring system compatibility, (2) understanding the mandatory nature of the system, and (3) possessing an absolute cap on emissions.<sup>206</sup>

Linking brings several benefits, it: (1) reduces the cost of lowering emissions, (2) increases market liquidity, (3) stabilises the carbon price, (4) harmonises carbon prices in

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<sup>199</sup> The Oxford Institute for Energy Studies, 'The EU ETS Phase IV Reform: Implications for System Functioning and for the Carbon Price Signal' (Web Page, September 2018) 5-6  
<<https://www.oxfordenergy.org/wpcms/wp-content/uploads/2018/09/The-EU-ETS-phase-IV-reform-implications-for-system-functioning-and-for-the-carbon-price-signal-Insight-38.pdf>>.

<sup>200</sup> European Commission, *Market Stability Reserve* (Web Page)  
<[https://ec.europa.eu/clima/policies/ets/reform\\_en](https://ec.europa.eu/clima/policies/ets/reform_en)>.

<sup>201</sup> Benchmarking means 'an emission rate that characterizes efficient production and that, it is argued, should be the basis for allocation with appropriate adjustment for the level of past or expected production.' in A. D. Ellerman et al, *Pricing Carbon: The European Union Emissions Trading Scheme* (Cambridge University Press, 2010) 64.

<sup>202</sup> A. D. Ellerman et al, *Pricing Carbon: The European Union Emissions Trading Scheme* (Cambridge University Press, 2010) 64.

<sup>203</sup> A. D. Ellerman et al, *Pricing Carbon: The European Union Emissions Trading Scheme* (Cambridge University Press, 2010) 64-65.

<sup>204</sup> *Directive 2003/87/EC* art 25.

<sup>205</sup> Thorvald Moe, 'Norwegian Climate Policies 1990-2010: Principles, Policy Instruments and Political Economy Aspects' (CICERO Policy Note 2010:03) 21.

<sup>206</sup> European Commission, *International Carbon Market* (Web Page)  
<[https://ec.europa.eu/clima/policies/ets/markets\\_en](https://ec.europa.eu/clima/policies/ets/markets_en)>.

other jurisdictions, and (5) supports global cooperation on climate change.<sup>207</sup> Recently, in January 2020, the EU ETS was linked with Switzerland's ETS.<sup>208</sup> At one point, the EU and Australia were considering linking their systems together. However, due to the 2014 repeal of the Australian ETS system and carbon pricing mechanism, this became impossible.

The Norwegian ETS link with the EU ETS is beneficial for Norway as it assists Norway to modestly reduce its GHGe and maintain stable emissions, despite its active involvement in the fossil fuel industry. GHGe in Norway might be much higher without the link with the EU ETS.

### 2.5.2 Key Features of the Norwegian Emissions Trading Scheme

#### 2.5.2(a) Targets/Cap

Norway participated in a 'one-way linkage' with the EU ETS in Phase I (pilot phase).<sup>209</sup> The ETS target was based on the application of the *KP* targets during this Phase. The emissions target for Norway under the *KP* was 'one per cent over 1990 levels for the first commitment period (2008-2012)'.<sup>210</sup>

The Norwegian Ministry of Environment aimed for the Norwegian ETS to make an annual reduction of between 500,000 and one million tonnes.<sup>211</sup> In 2007, the Norwegian Carbon Credit Procurement Program was established to ensure that Norway met its target

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<sup>207</sup> European Commission, *International Carbon Market* (Web Page) <[https://ec.europa.eu/clima/policies/ets/markets\\_en](https://ec.europa.eu/clima/policies/ets/markets_en)>; S.E. Weishaar, *Emissions Trading Design: A Critical Overview* (Edward Elgar Publishing, 2014) 191-192.

<sup>208</sup> Council of the European Union, 'Linking of Switzerland to the EU Emissions Trading System – Entry into Force on 1 January 2020', *European Council* (Web Page, 9 December 2019) <<https://www.consilium.europa.eu/en/press/press-releases/2019/12/09/linking-of-switzerland-to-the-eu-emissions-trading-system-entry-into-force-on-1-january-2020/>>.

<sup>209</sup> IETA, *Norway: An Emissions Trading Case Study* (Web Page, May 2015) 5-7 <[https://www.ieta.org/resources/Resources/Case\\_Studies\\_Worlds\\_Carbon\\_Markets/2015/norway\\_case\\_study\\_may2015.pdf](https://www.ieta.org/resources/Resources/Case_Studies_Worlds_Carbon_Markets/2015/norway_case_study_may2015.pdf)>.

<sup>210</sup> Environmental Defense Fund, *Norway The World's Carbon Markets: A Case Study Guide to Emissions Trading* (Web Page, May 2013) 3 <[https://www.edf.org/sites/default/files/EDF\\_IETA\\_Norway\\_Case\\_Study\\_May\\_2013.pdf](https://www.edf.org/sites/default/files/EDF_IETA_Norway_Case_Study_May_2013.pdf)>.

<sup>211</sup> P.E.G. Medina, 'Climate Change Mitigation: A Carbon Tax or An Emissions Trading Scheme? An Analysis of the Norwegian Perspective' (Master Thesis, Norwegian School of Economics Bergen, 2013) 17 citing E.; E.I. (2008, June 8). *Economic Instruments – Tradeable Permits: Emissions Trading Scheme (Norway)*. Hentet May 29, 2013 fra Economic Instruments in Environmental Policy: <http://www.economicinstruments.com/index.php/climate-change/article/100->

under the first commitment period of the *KP*.<sup>212</sup> In 2008, Norway became part of Phase II of the EU ETS which broadened the scheme to cover at least 40% of Norwegian GHGe.<sup>213</sup>

### 2.5.2(b) Sector Coverage

The Norwegian ETS only covered 51 installations.<sup>214</sup> During the first phase between 2005-2007, emissions from industrial sources were covered.<sup>215</sup> The national ETS covered industries that were exempted from the CO<sub>2</sub> tax. It covered only CO<sub>2</sub> emissions from oil refineries, gas refineries, the petrochemical industry, gas-fired power stations, coke, iron, steel, cement, glass, and ceramic products.<sup>216</sup>

In Phase I, sectors covered under the CO<sub>2</sub> tax were not included in this phase.<sup>217</sup> After the amendments in 2007, sectors subject to the CO<sub>2</sub> tax were included in the ETS. This was done to make the Norwegian ETS compatible with the EU ETS. Due to the amendments, the Norwegian ETS covered more entities, including the petroleum industry. The Norwegian ETS covered 60% of emissions in Norway.<sup>218</sup> In Phase II, the coverage was expanded beyond CO<sub>2</sub> to cover nitrous oxide (N<sub>2</sub>O).<sup>219</sup>

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<sup>212</sup> Norwegian Ministry of Climate and Environment, Parliament of Norway, *Status report as of January 2018 Norway's Seventh National Communication Under the Framework Convention on Climate Change* (Report, January 2018) 81  
<[http://unfccc.int/files/national\\_reports/annex\\_i\\_natcom/submitted\\_natcom/application/pdf/529371\\_norway-nc7-br3-1-nc7\\_-\\_br3\\_-\\_final.pdf](http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/529371_norway-nc7-br3-1-nc7_-_br3_-_final.pdf)>.

<sup>213</sup> Norwegian Ministry of Climate and Environment, Parliament of Norway, *Status report as of January 2018 Norway's Seventh National Communication Under the Framework Convention on Climate Change* (Report, January 2018) 79  
<[http://unfccc.int/files/national\\_reports/annex\\_i\\_natcom/submitted\\_natcom/application/pdf/529371\\_norway-nc7-br3-1-nc7\\_-\\_br3\\_-\\_final.pdf](http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/529371_norway-nc7-br3-1-nc7_-_br3_-_final.pdf)>.

<sup>214</sup> Norwegian Ministry of the Environment, Parliament of Norway, *Norwegian National Allocation Plan for The Emissions Trading System in 2008-2012* (Report, March 2008) 21  
<[https://www.regjeringen.no/globalassets/upload/md/vedlegg/planer/nap\\_final\\_esa\\_260308.pdf](https://www.regjeringen.no/globalassets/upload/md/vedlegg/planer/nap_final_esa_260308.pdf)>.

<sup>215</sup> Norwegian Ministry of the Environment, Parliament of Norway, *Norway's Report on Demonstrable Progress Under the Kyoto Protocol Status Report as of December 2005* (Report, 2005) 8  
<<https://unfccc.int/resource/docs/dpr/nor1.pdf>>.

<sup>216</sup> S. Aakre and A. Torvanger, 'Case Studies on Climate Change Response Policies and Strategies of Selected Annex I Countries: Norway and Sweden' (CICERO Report December 2007:10) 33  
<[https://pub.cicero.oslo.no/cicero-xmlui/bitstream/handle/11250/191968/CICERO\\_Report\\_2007-10.pdf?sequence=1&isAllowed=y](https://pub.cicero.oslo.no/cicero-xmlui/bitstream/handle/11250/191968/CICERO_Report_2007-10.pdf?sequence=1&isAllowed=y)>.

<sup>217</sup> 'Norway The World's Carbon Markets: A Case Study Guide to Emissions Trading', *Environmental Defense Fund* (Web Page, May 2013) 3  
<[https://www.edf.org/sites/default/files/EDF\\_IETA\\_Norway\\_Case\\_Study\\_May\\_2013.pdf](https://www.edf.org/sites/default/files/EDF_IETA_Norway_Case_Study_May_2013.pdf)>.

<sup>218</sup> 'Norway The World's Carbon Markets: A Case Study Guide to Emissions Trading', *Environmental Defense Fund* (Web Page, May 2013) 2  
<[https://www.edf.org/sites/default/files/EDF\\_IETA\\_Norway\\_Case\\_Study\\_May\\_2013.pdf](https://www.edf.org/sites/default/files/EDF_IETA_Norway_Case_Study_May_2013.pdf)>.

<sup>219</sup> 'Norway The World's Carbon Markets: A Case Study Guide to Emissions Trading', *Environmental Defense Fund* (Web Page, May 2013) 2  
<[https://www.edf.org/sites/default/files/EDF\\_IETA\\_Norway\\_Case\\_Study\\_May\\_2013.pdf](https://www.edf.org/sites/default/files/EDF_IETA_Norway_Case_Study_May_2013.pdf)>.

### 2.5.2(c) Allocation of Allowances

Allowances were given for free in Phase I and subsequently reduced in Phase II.<sup>220</sup> The oil and gas sector received no free allowances as most emissions came from this sector. Norway had to submit a NAP for Phase II in order to be eligible for the EU ETS linking. The NAP had to be approved by the European Free Trade Association Surveillance Authority to enable the Norwegian entities to transfer their allowances from the Norwegian ETS to the EU ETS.<sup>221</sup>

### 2.5.2(d) Linkage with the EU ETS

In 2007, Norway amended its domestic ETS to make it compatible with *Directive 2003/87/EC* and to facilitate joining Phase II of the EU ETS.<sup>222</sup> Subsequently, in 2008, Norway was linked with Phase II of the EU ETS.<sup>223</sup>

## 2.5.3 Evaluation of the European Union Emissions Trading Scheme

### 2.5.3(a) Advantages and Disadvantages of the European Union Emissions Trading Scheme

The EU ETS is a useful tool to achieve its *Paris Agreement (PA)* targets. The EU ETS has many advantages,<sup>224</sup> including:

- (a) it ensures environmental effectiveness by targeting emissions reductions – It sets an emissions cap which is tighten over time across the sectors that are covered with the aim of reducing GHGe;
- (b) it is cost effective – by allowing trading of allowances within the cap;

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<sup>220</sup> 'Norway The World's Carbon Markets: A Case Study Guide to Emissions Trading', *Environmental Defense Fund* (Web Page, May 2013) 2

<[https://www.edf.org/sites/default/files/EDF\\_IETA\\_Norway\\_Case\\_Study\\_May\\_2013.pdf](https://www.edf.org/sites/default/files/EDF_IETA_Norway_Case_Study_May_2013.pdf)>.

<sup>221</sup> Norwegian Ministry of the Environment, Parliament of Australia, *Norwegian National Allocation Plan for The Emissions Trading System in 2008-2012* (Report, March 2008) 6

<[https://www.regjeringen.no/globalassets/upload/md/vedlegg/planer/nap\\_final\\_esa\\_260308.pdf](https://www.regjeringen.no/globalassets/upload/md/vedlegg/planer/nap_final_esa_260308.pdf)>.

<sup>222</sup> 'Norway The World's Carbon Markets: A Case Study Guide to Emissions Trading', *Environmental Defense Fund* (Web Page, May 2013) 1

<[https://www.edf.org/sites/default/files/EDF\\_IETA\\_Norway\\_Case\\_Study\\_May\\_2013.pdf](https://www.edf.org/sites/default/files/EDF_IETA_Norway_Case_Study_May_2013.pdf)>.

<sup>223</sup> Norwegian Ministry of Climate and Environment, Parliament of Norway, *Status report as of January 2018 Norway's Seventh National Communication Under the Framework Convention on Climate Change* (Report, January 2018) 79

<[http://unfccc.int/files/national\\_reports/natcom/annex\\_i\\_natcom/submitted\\_natcom/application/pdf/529371\\_norway-nc7-br3-1-nc7\\_-\\_br3\\_-\\_final.pdf](http://unfccc.int/files/national_reports/natcom/annex_i_natcom/submitted_natcom/application/pdf/529371_norway-nc7-br3-1-nc7_-_br3_-_final.pdf)>.

<sup>224</sup> A. Eden et al, 'Benefits of Emissions Trading: Taking Stock of the Impacts of Emissions Trading Systems Worldwide', *International Carbon Action Partnership* (Web Page, 2018) 4-6

<[https://icapcarbonaction.com/en/?option=com\\_attach&task=download&id=575](https://icapcarbonaction.com/en/?option=com_attach&task=download&id=575)>; 'Benefits of Emissions Trading', *International Emissions Trading Association* (Web Page, 2015)

<<https://www.ieta.org/resources/Resources/101s/ieta-emissions-trading-101-library-april2015.pdf>>; Zahar, Peel and Godden, *Australian Climate Law in Global Context* (Cambridge University Press, 2013) 172.

- (c) it is flexible – gives emitters the flexibility to trade their allowances. The emitters can buy and sell units as long as it falls within the overall cap;
- (d) it encourages low-carbon development;
- (e) it generates revenue for the Government; and
- (f) it allows linking with other systems.

There have been shortcomings in the implementation of the EU ETS. Prominent disadvantages<sup>225</sup> of the EU ETS include:

- (a) price volatility – caused by over-allocation of emission allowances. Allowances were allocated for free ('grandfathering')<sup>226</sup> or via auction. The free allocation of allowances created disputes and attracted criticism as to the effectiveness and purpose of the EU ETS. This is because the practice of 'grandfathering' went against the 'polluter pays' principle and contradicts *Treaty on the European Union (2002/C325/01)* art 174(2) which states that 'environmental damage should as a priority be rectified at source and that the polluter should pay.' However, allowances were allocated for free during the start-up of the EU ETS. Due to the oversupply of allowances, carbon prices dropped with some industries having the view that it was cheaper to pollute;
- (b) governance problems leading to over allocation of emission allowances;
- (c) monitoring problems – susceptibility to fraud;
- (d) potential bias towards one party; and
- (e) carbon leakage – When there are increased costs due to climate policies, there is a tendency for carbon leakage to happen. Carbon leakage is defined as 'the increase in CO<sub>2</sub> emissions outside the countries taking domestic mitigation action divided by the reduction in the emissions of these countries'.<sup>227</sup> The recent EU ETS *Directive 2018/410/EC* contains some measures to address the issue of carbon leakage.

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<sup>225</sup> S. Borghesi and M. Montini, 'The Best (and Worst) of GHG Emission Trading Systems: Comparing the EU ETS with Its Followers' (2016) 4(27) *Frontiers in Energy Research* 3; Zahar, Peel and Godden, *Australian Climate Law in Global Context* (Cambridge University Press, 2013) 172.

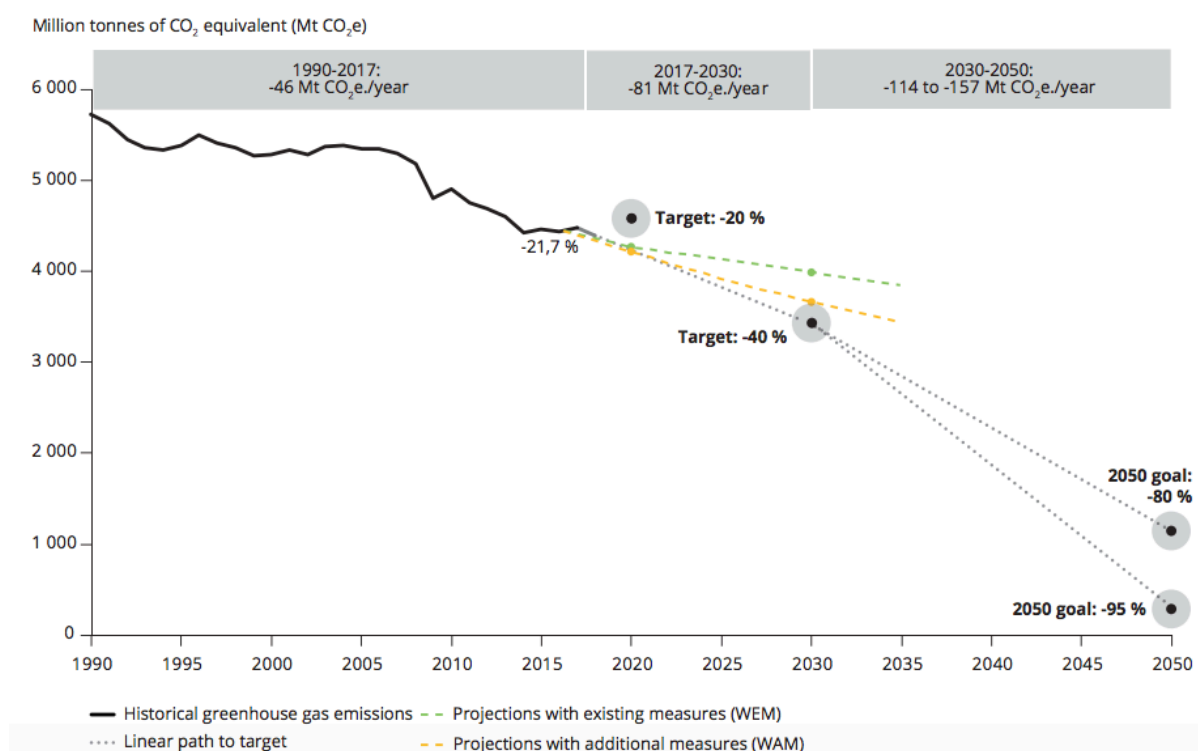
<sup>226</sup> Grandfathering refers to 'free allocation of allowances to enterprises based on their historical emissions'. Source: S.E. Weishaar, *Emissions Trading Design: A Critical Overview* (Edward Elgar Publishing, 2014) 106.

<sup>227</sup> Intergovernmental Panel on Climate Change, *Climate Change 2007 Mitigation*, ed B. Metz, O. Davidson, P. Bosch, R. Dave and L. Meyer (Cambridge University Press, 2007) 665.

### 2.5.3(b) Effectiveness of the European Union Emissions Trading Scheme

The EU ETS is an effective instrument, reducing GHGe and encouraging industries to invest in new technologies.<sup>228</sup> This relates to the drop in RE generation costs creating opportunities to switch from high carbon-intensive plants to low-emissions. The European Environmental Agency graph below in Figure 7 shows a downward GHGe trend demonstrating the effectiveness of the EU ETS.

**Figure 7: Greenhouse Gas (GHG) Emissions trends, projections and targets in the EU, 1990-2050**<sup>229</sup>



### 2.5.3(c) Success Rate of the European Union Emissions Trading Scheme

The EU ETS faced ‘teething’ problems initially which are slowly being rectified over time. Currently, the EU ETS is the largest ETS in the world. It has proved its success by placing an effective price on carbon. In 2016, emissions were reduced by 2.9% from participating

<sup>228</sup> Andrei Marcu et al, *2018 State of the EU ETS Report* (Report, 2018) 18-19  
[https://www.ictsd.org/sites/default/files/20180416\\_2018\\_state\\_of\\_eu\\_ets\\_report\\_-\\_final\\_all\\_logos\\_.pdf](https://www.ictsd.org/sites/default/files/20180416_2018_state_of_eu_ets_report_-_final_all_logos_.pdf).

<sup>229</sup> European Environment Agency, *Trends and Projections in Europe 2019: Tracking progress towards Europe’s climate and energy targets* (Report No. 15/2019, 2019) 20  
<https://www.eea.europa.eu/publications/trends-and-projections-in-europe-1>.



installations.<sup>230</sup> To stabilise the European carbon market, the MSR was introduced in early 2019. It is projected that, in 2020, the EU's emissions would be '21% lower than in 2005' and in 2030, '43% lower'.<sup>231</sup>

To ensure the EU ETS is able to face upcoming challenges, there are a number of significant issues that will need to be monitored: (a) management of allowances through the MSR, (b) reduction of policy uncertainty, (c) management of the risk of carbon leakage, (d) alignment of the EU ETS with *PA* goals, and (e) provision of financial support and assistance for a transition towards a low carbon economy.<sup>232</sup>

The EU ETS is a useful tool and, as Weishaar points out, a tool is used to achieve a goal: 'a hammer is used to hammer; a greenhouse gas emissions trading system is used to reduce greenhouse gases.'<sup>233</sup> The EU ETS has gone through some revisions and aspires to be more effective in Phase IV.

### *2.5.3(d) Lessons Learnt from the European Union Emissions Trading Scheme*

Across a number of years, the EU ETS has made various improvisations to enhance the system. Pohlmann notes that there are a number of lessons that can be learnt from the EU ETS experience: (a) it is essential to have harmonised rules and procedures to reduce internal market distortions; (b) it is important to have centralised setting of an emissions cap and a transparent process of reducing the overall cap; (c) have a standard process on allowance allocation; (d) increasing coverage on sectors can help market liquidity and price volatility; (e) have strong compliance and enforcement mechanisms; and (f) have additional climate policy instruments to work together with the EU ETS.<sup>234</sup>

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<sup>230</sup> European Commission, *Carbon Market Report: ETS Surplus Falling to Lowest Level Since 2013* (Web Page) <[https://ec.europa.eu/clima/policies/ets\\_en](https://ec.europa.eu/clima/policies/ets_en)>.

<sup>231</sup> European Commission, *EU Emissions Trading System (EU ETS)* (Web Page) <[https://ec.europa.eu/clima/policies/ets\\_en](https://ec.europa.eu/clima/policies/ets_en)>.

<sup>232</sup> A. Marcu et al, *2018 State of the EU ETS Report* (Report, 2018) 2 <[https://www.ictsd.org/sites/default/files/20180416\\_2018\\_state\\_of\\_eu\\_ets\\_report\\_-\\_final\\_all\\_logos\\_.pdf](https://www.ictsd.org/sites/default/files/20180416_2018_state_of_eu_ets_report_-_final_all_logos_.pdf)>.

<sup>233</sup> S.E. Weishaar, *Emissions Trading Design: A Critical Overview* (Edward Elgar Publishing, 2014) 5.

<sup>234</sup> M. Pohlmann, 'The European Union Emissions Trading Scheme' in D. Freestone and C. Streck, *Legal Aspects of Carbon Trading: Kyoto, Copenhagen, and Beyond* (Oxford University Press, 2009) 337, 365-366.

### 3.0 Current Climate Change Mitigation Legislation and Policies in Norway

As mentioned earlier in this chapter, Norway has managed to reduce and maintain a relatively stable level of emissions. This section discusses the current climate change mitigation legislation and policies which contribute to the success of Norway in reducing/maintaining GHGe, namely the *PCA 1981*, carbon tax, the ETS, and the *CCA 2017*.

The sections below discuss how Norway regulates GHGe. There is regulation on pollution as seen in the *PAA 1996*<sup>235</sup> but it is not specifically directed towards GHGe. *PAA 1996* ch 7 imposes liability for pollution damage.<sup>236</sup> *PAA 1996* s 7-2 applies to 'liability for pollution damage from a facility when such damage occurs in Norway or inside the outer limits of the Norwegian continental shelf or affects a Norwegian vessel, Norwegian hunting or catching equipment or Norwegian facility in adjacent sea areas.' Failure to comply with the provision of the Act leads to fines or imprisonment.<sup>237</sup> The *PAA 1996* acknowledges the broader parameters of the petroleum industry and does not hold the petroleum industry accountable for the harm caused by its GHGe.

The two main instruments used to reduce GHGe in Norway are the carbon tax and the ETS, both of which are market-based instruments. These instruments are flexible, cost effective and efficient in reducing the rigidity in the command and control system by imposing a price on pollution. As noted by Gunningham, economic instruments are more efficient than command and control regulation.<sup>238</sup> In Norway, it is a mixture of command and control regulation and incentivising measures. These instruments incorporate the 'polluter pays' principle.

#### 3.1 Pollution Control Act 1981

The *PCA 1981* was the first piece of legislation concerning waste and pollution issues used to regulate GHGe in Norway.<sup>239</sup> Its objective is to 'protect the outdoor environment

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<sup>235</sup> *Petroleum Activities Act 1996* (Norway) (Act 29 November 1996 No. 72 relating to petroleum activities).

<sup>236</sup> According to *Petroleum Activities Act 1996* s 7-1, pollution damage is 'damage or loss caused by pollution as a consequence or effluence or discharge of petroleum from a facility, including a well, and costs of reasonable measures to avert or limit such damage or such loss, as well as damage or loss as a consequence of such measures.'

<sup>237</sup> *Petroleum Activities Act 1996* (Norway) s 10-17.

<sup>238</sup> N. Gunningham, 'Environment Law, Regulation and Governance: Shifting Architectures' (2009) 21(2) *Journal of Environmental Law* 179, 185.

<sup>239</sup> Norwegian Ministry of Climate and Environment, Parliament of Norway, *Status report as of January 2018 Norway's Seventh National Communication Under the Framework Convention on*

against pollution and to reduce existing pollution, to reduce the quantity of waste and to promote better waste management'.<sup>240</sup> It was the first piece of legislation concerning waste and pollution issues. According to *PCA 1981* s 6, 'pollution' means:

- (1) the introduction of solids, liquids or gases to air, water or ground,
- (2) noise and vibrations,
- (3) light and other radiation to the extent decided by the pollution control authority,
- (4) effects on temperature

which cause or may cause damage or nuisance to the environment.

This Act does not specifically define what gases it regulates. Arguably GHGe falls within the definition of pollution. However, the Norwegian Ministry of Climate and Environment affirms that the *PCA 1981* applies to GHGe.<sup>241</sup>

The *PCA 1981* requires a permit to be obtained for GHGe from petroleum operations,<sup>242</sup> prohibiting pollution without a permit<sup>243</sup> from the authority. Every person has a duty to avoid polluting the environment.<sup>244</sup> Some forms of pollution that are classified as 'ordinary' are permitted under the Act, such as pollution from '(1) fisheries, agriculture and forestry, etc., (2) housing, holiday homes, offices, business premises or assembly rooms, schools, hotels and warehouses, and the like, and (3) temporary construction activity'.<sup>245</sup> The Act places the responsibility on the emitter to control actions that cause high pollution levels. Emphasis is also placed on measures to prevent or limit emissions.<sup>246</sup>

The Pollution Control Authority, which reports directly to the Norwegian Ministry of the Environment, is responsible for ensuring compliance with the Act and monitors pollution.<sup>247</sup>

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*Climate Change* (Report, January 2018) 13, 91

<[http://unfccc.int/files/national\\_reports/annex\\_i\\_natcom/submitted\\_natcom/application/pdf/529371\\_norway-nc7-br3-1-nc7\\_-\\_br3\\_-\\_final.pdf](http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/529371_norway-nc7-br3-1-nc7_-_br3_-_final.pdf)>.

<sup>240</sup> *Pollution Control Act 1981* (Norway) s 1. This Act is available in English at <https://www.regjeringen.no/en/dokumenter/pollution-control-act/id171893/>.

<sup>241</sup> Norwegian Ministry of Climate and Environment, Parliament of Norway, *Status report as of January 2018 Norway's Seventh National Communication Under the Framework Convention on Climate Change* (Report, January 2018) 13, 91

<[http://unfccc.int/files/national\\_reports/annex\\_i\\_natcom/submitted\\_natcom/application/pdf/529371\\_norway-nc7-br3-1-nc7\\_-\\_br3\\_-\\_final.pdf](http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/529371_norway-nc7-br3-1-nc7_-_br3_-_final.pdf)>.

<sup>242</sup> Norwegian Ministry of Climate and Environment, Parliament of Norway, *Status report as of January 2018 Norway's Seventh National Communication Under the Framework Convention on Climate Change* (Report, January 2018) 93

<[http://unfccc.int/files/national\\_reports/annex\\_i\\_natcom/submitted\\_natcom/application/pdf/529371\\_norway-nc7-br3-1-nc7\\_-\\_br3\\_-\\_final.pdf](http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/529371_norway-nc7-br3-1-nc7_-_br3_-_final.pdf)>.

<sup>243</sup> According to *Pollution Control Act 1981* s 11, '(T)he pollution control authority may on application issue a permit for any activity that may lead to pollution.'

<sup>244</sup> *Pollution Control Act 1981* (Norway) s 7.

<sup>245</sup> *Pollution Control Act 1981* (Norway) s 8.

<sup>246</sup> *Pollution Control Act 1981* (Norway) s 2.

<sup>247</sup> *Pollution Control Act 1981* (Norway) s 48.

Any person that does anything that generates pollution or waste has a duty to provide the Pollution Control Authority or other public bodies with any information necessary to enable them to carry out their tasks.<sup>248</sup> A person who fails to comply with the Act may face a fine or imprisonment depending on the severity of the pollution.<sup>249</sup>

### 3.2 Carbon Tax – CO<sub>2</sub> Tax Act 1991<sup>250</sup>

The CO<sub>2</sub> Tax Act 1991 was used to achieve the stabilisation target.<sup>251</sup> The tax was introduced on CO<sub>2</sub> emissions from oil and gas production, being the highest contributor of CO<sub>2</sub> emissions. The CO<sub>2</sub> tax 'shall be paid to the Treasury on the burning of petroleum and discharge of natural gas in connection with petroleum activities on the continental shelf'.<sup>252</sup> The Organisation for Economic Co-operation and Development is of the view that the 'CO<sub>2</sub> tax is not exactly a tax on CO<sub>2</sub> emissions but an excise duty on certain products whose combustion emits CO<sub>2</sub>'.<sup>253</sup> However, the Act clearly states that it is a tax.

This tax is charged on petroleum that is burnt and natural gas which is discharged into the air.<sup>254</sup> The tax also applies to CO<sub>2</sub> that is separated from the petroleum and discharged into the air, and on installations related to the production or transportation of petroleum.<sup>255</sup> The production licensees must pay the CO<sub>2</sub> tax.<sup>256</sup> Failure to do so may result in a fine or imprisonment of up to three months.<sup>257</sup> GHGe from processing industries and agriculture were

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<sup>248</sup> *Pollution Control Act 1981* (Norway) s 49.

<sup>249</sup> *Pollution Control Act 1981* (Norway) s 78.

<sup>250</sup> This Act is also known as Act 21 December 1990 no. 72 relating to tax on discharge of CO<sub>2</sub> in the petroleum activities on the continental shelf. The term carbon tax or CO<sub>2</sub> tax is used interchangeably, and it connotes the same meaning.

<sup>251</sup> Sjur Kasa, 'Social and Political Barriers to Green Tax Reform: The Case of CO<sub>2</sub> Taxes in Norway' (CICERO Policy Note 1999:5, CICERO, 1999) 6 <[https://pub.cicero.oslo.no/cicero-xmlui/bitstream/handle/11250/191820/CICERO\\_Policy\\_Note\\_1999-05.pdf?sequence=1&isAllowed=y](https://pub.cicero.oslo.no/cicero-xmlui/bitstream/handle/11250/191820/CICERO_Policy_Note_1999-05.pdf?sequence=1&isAllowed=y)>.

<sup>252</sup> *CO<sub>2</sub> Tax Act 1991* (Norway) s 1.

<sup>253</sup> Paul O'Brien, 'Norway – Sustainable Development: Climate Change and Fisheries Policies' (OECD Economics Department Working Papers No. 805, OECD Publishing, Paris, 2010) 15 <<https://www.oecd-ilibrary.org/docserver/5km68fzsk9xs-en.pdf?expires=1585797247&id=id&accname=guest&checksum=8CAE70D3383DCF477374FB27E42AAA7C>>.

<sup>254</sup> *CO<sub>2</sub> Tax Act 1991* (Norway) s 2.

<sup>255</sup> *CO<sub>2</sub> Tax Act 1991* (Norway) s 2.

<sup>256</sup> *CO<sub>2</sub> Tax Act 1991* (Norway) s 4.

<sup>257</sup> *CO<sub>2</sub> Tax Act 1991* (Norway) s 7.

exempted from the CO<sub>2</sub> tax.<sup>258</sup> Similarly, the fishing industry, transport by air and sea, cement manufacturing and land based use of tax were also exempted.<sup>259</sup>

According to the Norwegian Ministry of Environment, the tax covers 'about 60 per cent of Norwegian CO<sub>2</sub> emissions'.<sup>260</sup> In the recent National Budget 2020, the Norwegian Government proposed to increase the CO<sub>2</sub> tax (i.e carbon tax) by 5% in 2020.<sup>261</sup> Despite the operation of a carbon tax in Norway, companies still find it an attractive place to invest.

### *3.3 Emissions Trading Scheme*

The ETS has played a prominent role in environmental policy development over the last few decades, particularly in Norway and the EU. It is preferable due to its cost-effectiveness, flexibility, predictability, and political advantages.<sup>262</sup> The *KP* was the main motivational driver of the ETS concept in the context of regulation to reduce GHGe. Norway developed a domestic ETS from 1998 and linked it to the EU ETS in 2008.<sup>263</sup> There was increased focus on an ETS due to the country's energy profile, the economic interest in the oil and gas industry, and commitment to addressing climate change.<sup>264</sup> Chapter 1 outlined the different models of emissions trading mechanisms.<sup>265</sup> This section explains how the Norwegian ETS and the EU ETS follow the 'cap and trade' model.

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<sup>258</sup> Norwegian Ministry of the Environment, Parliament of Norway, *Norwegian Climate Policy: Summary in English: Report No. 54 to the Storting (2000-2001)* (Report, June 2001) 13 <<https://www.regjeringen.no/contentassets/91b54f03dc224f3397c95b04be350f49/en-gb/pdfs/stm200020010054000engpdfs.pdf>>.

<sup>259</sup> A. Bruvoll and B.M. Larsen, 'Greenhouse Gas Emissions in Norway: Do Carbon Taxes Work?' (2004) 32 *Energy Policy* 493, 498.

<sup>260</sup> Norwegian Ministry of the Environment, Parliament of Norway, *Norway's Report on Demonstrable Progress Under the Kyoto Protocol Status Report as of December 2005* (Report, 2005) 8 <<https://unfccc.int/resource/docs/dpr/nor1.pdf>>.

<sup>261</sup> Royal Ministry of Finance, Parliament of Norway, *The National Budget 2020: A Summary* (Report, 2019-2020) <[https://www.regjeringen.no/contentassets/dd85dd71ed1847bbb518e5a8d4f5a97e/national\\_budget\\_2020.pdf](https://www.regjeringen.no/contentassets/dd85dd71ed1847bbb518e5a8d4f5a97e/national_budget_2020.pdf)>.

<sup>262</sup> R. Baldwin, 'Regulation Lite: The Rise of Emissions Trading' (2008) 2 *Regulation & Governance* 193, 195-196.

<sup>263</sup> Norwegian Ministry of the Environment, Parliament of Norway, *Norway's Report on Demonstrable Progress Under the Kyoto Protocol Status Report as of December 2005* (Report, 2005) 8 <<https://unfccc.int/resource/docs/dpr/nor1.pdf>>.

<sup>264</sup> G. Bang et al, 'Meeting Kyoto Commitments: European Union Influence on Norway and Germany' (CICERO Working Paper 2004:12, CICERO, December 2004) 9.

<sup>265</sup> The different models of emissions trading was discussed briefly in Chapter 1.

### 3.3.1 Greenhouse Gas Emissions Trading Act 2004<sup>266</sup>

The Norwegian ETS effectively only operated in Phase I as it was subsequently linked to the EU ETS.<sup>267</sup> The *GGETA 2004* entered into force in 2005 to support the Norwegian ETS and remains in force aiming to limit GHGe cost effectively even after the linkage.<sup>268</sup> This was done to meet Norway's *KP* targets.

The Act applies to the following CO<sub>2</sub> emissions:

- (a) energy production, (b) refining of mineral oil, (c) coke production, (d) production and processing of iron and steel, including roasting and sintering of iron ore, (e) production of cement, lime, glass, glass fibre, and ceramic products, (f) production of paper, board and pulp from timber or other fibrous material.<sup>269</sup>

The Act also applies to the energy sector and heavy industry sectors while the transport sector and combustion from waste is exempted.<sup>270</sup>

An operator that emits is required to report its emissions to the Pollution Control Authority by 1 March each year.<sup>271</sup> If an operator fails to report on time, their trading allowances are suspended until the report is submitted,<sup>272</sup> and the operator can be liable to fines or a term of imprisonment not exceeding three months.<sup>273</sup>

The Norwegian Emissions Trading Registry was set up to manage the allocation of allowances. The number of allowances allocated between 1 January 2008 and 31 December 2012 was determined by the King.<sup>274</sup> Allowances were allocated for free between 2008 and 2012.<sup>275</sup> The Pollution Control Authority then determined the amount of free allowances to be allocated to each operator<sup>276</sup> and the Climate and Pollution Agency designated the allowances to the operators within the national cap.

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<sup>266</sup> *Greenhouse Gas Emissions Trading Act 2004* (Norway) Act of 17 December 2004 No. 99 relating to Greenhouse Gas Emission Allowance Trading and the Duty to Surrender Emission Allowances.

<sup>267</sup> See section 2.4.3 on the development of the Norwegian domestic ETS.

<sup>268</sup> *Greenhouse Gas Emissions Trading Act 2004* (Norway) s 1.

<sup>269</sup> *Greenhouse Gas Emissions Trading Act 2004* (Norway) s 3.

<sup>270</sup> *Greenhouse Gas Emissions Trading Act 2004* (Norway) s 3.

<sup>271</sup> *Greenhouse Gas Emissions Trading Act 2004* (Norway) s 16.

<sup>272</sup> *Greenhouse Gas Emissions Trading Act 2004* (Norway) s 19.

<sup>273</sup> *Greenhouse Gas Emissions Trading Act 2004* (Norway) s 22.

<sup>274</sup> *Greenhouse Gas Emissions Trading Act 2004* (Norway) s 6.

<sup>275</sup> *Greenhouse Gas Emissions Trading Act 2004* (Norway) s 7.

<sup>276</sup> *Greenhouse Gas Emissions Trading Act 2004* (Norway) s 8.

An operator that falls within one of the above-mentioned sectors has to open an account in the Norwegian Emissions Trading Registry,<sup>277</sup> and is required to surrender allowances.<sup>278</sup> Failure to do so may result in a fine being imposed.<sup>279</sup> In addition, installations need to obtain a discharge permit for surrendering of allowances as required in *PCA 1981* s 11.<sup>280</sup>

### 3.3.2 European Union Emissions Trading Scheme

The EU ETS has been explained in detail in section 2.4. The concept of 'double regulation' applies in Norway. The term 'double regulation' means both a carbon tax and an ETS. This is applicable to activities from offshore petroleum where the reserves are allocated. It is done intentionally to strictly apply the 'polluter pays' principle, as most emissions are from the petroleum industry. 'Double regulation' started when Norway joined Phase II of the EU ETS. Those engaged in petroleum activities had to pay CO<sub>2</sub> tax and surrender allowances. This resulted in companies paying up to NOK500 per tonne of CO<sub>2</sub>-e emitted which is considerably higher compared to carbon prices in other countries.<sup>281</sup>

As a result, the Norwegian Government has taken some adjustment approaches to deal with the overlap and avoid double counting of emissions, it: (a) reduced CO<sub>2</sub> tax rates, providing certain exemptions and deductions; and (b) made specific adjustment in the offshore petroleum sector.<sup>282</sup> The carbon tax was reduced for the petroleum sector after Norway joined the EU ETS in accordance with the *Directive 2003/96/EC*<sup>283</sup> on Energy Tax. Industrial processes are exempted from the CO<sub>2</sub> tax as discussed above in section 3.2. The concept of 'double regulation' was not burdensome, 'as long as it aims to maintain an overall reasonable CO<sub>2</sub> price, it does not result in double burden.'<sup>284</sup> Since both instruments apply to the

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<sup>277</sup> *Greenhouse Gas Emissions Trading Act 2004* (Norway) s 12.

<sup>278</sup> *Greenhouse Gas Emissions Trading Act 2004* (Norway) s 4.

<sup>279</sup> *Greenhouse Gas Emissions Trading Act 2004* (Norway) s 13.

<sup>280</sup> *Greenhouse Gas Emissions Trading Act 2004* (Norway) s 4.

<sup>281</sup> Catherine Banet, 'Effectiveness in Climate Regulation: Simultaneous Application of a Carbon Tax and an Emissions Trading Scheme to the Offshore Petroleum Sector in Norway' (2017) 11(1) *Carbon and Climate Law Review* 25, 33.

<sup>282</sup> Catherine Banet, 'Effectiveness in Climate Regulation: Simultaneous Application of a Carbon Tax and an Emissions Trading Scheme to the Offshore Petroleum Sector in Norway' (2017) 11(1) *Carbon and Climate Law Review* 25, 33-34.

<sup>283</sup> *Council Directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity* [2003] OJ L 283/51 ('*Directive 2003/96/EC*').

<sup>284</sup> Catherine Banet, 'Effectiveness in Climate Regulation: Simultaneous Application of a Carbon Tax and an Emissions Trading Scheme to the Offshore Petroleum Sector in Norway' (2017) 11(1) *Carbon and Climate Law Review* 25, 38.

petroleum industry, the carbon tax for this sector was lowered,<sup>285</sup> to reduce and avoid excessive costs for the industry.<sup>286</sup>

### *3.4 Paris Agreement Targets and A Carbon Budget<sup>287</sup>*

In order to implement the *PA* targets, the *CCA 2017* was passed during Solberg's term. This Act provides for Norway to become a low-emission society by 2050. Solberg also encouraged the Government to work together with the EU on a joint fulfilment in order to meet its 2030 commitment.<sup>288</sup> This was done mainly through the EU ETS. As for the non-ETS sectors, Norway cooperates with the EU under Effort Sharing Regulation.<sup>289</sup> The carbon tax was also adopted to help Norway meet these objectives.

The *CCA 2017* is a short piece of legislation which was adopted on 16 June 2017 and came into force on 1 January 2018.<sup>290</sup> It promoted the 'implementation of Norway's climate targets' transforming to a low emission society by 2050.<sup>291</sup> The Act includes a target to reduce GHGe by at least 40% below 1990 levels by 2030.<sup>292</sup> It was introduced to integrate with the EU ETS targets and caps, establishing legally binding targets for reducing emissions in 2030 and 2050. The Act has an 'overarching function' to work together with existing environmental legislation.<sup>293</sup>

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<sup>285</sup> M. Ptak, 'Norwegian Tax System from the Point of View of Climate Change Policy' (2014) 9(1) *Quarterly Journal of Economics and Economic Policy* 71, 84.

<sup>286</sup> H. Lindhjem et al, *The Use of Economic Instruments in Nordic Environmental Policy 2006-2009* (Report, 2009) 65-68 <[https://read.nordic-ilibrary.org/governance/the-use-of-economic-instruments-in-nordic-environmental-policy-2006-2009\\_tn2009-578#page4](https://read.nordic-ilibrary.org/governance/the-use-of-economic-instruments-in-nordic-environmental-policy-2006-2009_tn2009-578#page4)>.

<sup>287</sup> A carbon budget is defined as a 'tolerable quantity of greenhouse gas emissions that can be emitted in total over a specified time'. Source: WWF, 'Understanding Carbon Budgets' (Web Page, 2014) 2  
<[http://awsassets.wwf.org.za/downloads/understanding\\_carbon\\_budgets\\_final\\_nov\\_2014.pdf](http://awsassets.wwf.org.za/downloads/understanding_carbon_budgets_final_nov_2014.pdf)>.

<sup>288</sup> Norwegian Ministry of Climate and Environment, Parliament of Norway, *Status report as of January 2018 Norway's Seventh National Communication Under the Framework Convention on Climate Change* (Report, January 2018) 11  
<[http://unfccc.int/files/national\\_reports/annex\\_i\\_natcom/submitted\\_natcom/application/pdf/529371\\_norway-nc7-br3-1-nc7\\_-\\_br3\\_-\\_final.pdf](http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/529371_norway-nc7-br3-1-nc7_-_br3_-_final.pdf)>.

<sup>289</sup> Norwegian Ministry of Climate and Environment, Parliament of Norway, *Status report as of January 2018 Norway's Seventh National Communication Under the Framework Convention on Climate Change* (Report, January 2018) 11  
<[http://unfccc.int/files/national\\_reports/annex\\_i\\_natcom/submitted\\_natcom/application/pdf/529371\\_norway-nc7-br3-1-nc7\\_-\\_br3\\_-\\_final.pdf](http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/529371_norway-nc7-br3-1-nc7_-_br3_-_final.pdf)>.

<sup>290</sup> Government.no, *Climate Change Act* (Web Page, 16 June 2017)  
<<https://www.regjeringen.no/en/dokumenter/climate-change-act/id2593351/>>.

<sup>291</sup> *Climate Change Act 2017* (Norway) s 1. The translated version of this Act is found at <https://www.regjeringen.no/en/dokumenter/climate-change-act/id2593351/>.

<sup>292</sup> *Climate Change Act 2017* (Norway) s 3.

<sup>293</sup> Norwegian Ministry of Climate and Environment, Parliament of Norway, *Status report as of January 2018 Norway's Seventh National Communication Under the Framework Convention on Climate Change* (Report, January 2018) 10



Based on this legislation, the Government has to submit to the Storting (Parliament) updated climate targets in 2020. Subsequently, every five years, the climate targets will be reviewed based on the 'best available scientific knowledge and as far as possible be quantified and measurable'.<sup>294</sup> The climate target set has to be compatible with Norway's NDC under the *PA* and any joint implementation with the EU.<sup>295</sup>

Every year, the Government has to report to the Storting on developments in emissions and the measures taken to achieve climate targets, projections in emissions and uptake and implementation of climate targets; advise on steps taken to address climate change; and provide an overview of the emissions from the non-ETS sector and provide a report on Norway's carbon budget.<sup>296</sup>

The *CCA 2017* is beneficial as Norway's long term goals can be achieved with regular reporting, carbon budgets and an independent committee on climate change. However, the Act makes no specific mention of 'carbon budgets' or a committee on climate change. As such, it may be that the Act needs some revision to be more comprehensive.

The main purpose of the *CCA 2017* is to reduce emissions. However, it does not impose a duty on the Government to reduce emissions but, rather, sets a goal.<sup>297</sup> The Act also does not provide details or measures on how emissions should be reduced. The result and effect of this Act is as yet, unknown. In my view, the legislation will be effective, benefitting from revisions to make it more clear and comprehensive.

#### **4.0 Evaluating Greenhouse Gas Emissions Reduction Effect of Legislation and Policies**

Have Norway's legislation and policies to date reduced GHGe in the fossil fuel industry and economy wide? Based on the statistics provided earlier in this chapter, it is evident that Norway's legislation and policies are assisting Norway to modestly reduce its GHGe in the fossil fuel industry, with a relatively stable level of emissions since 2017. The three acts: *PCA 1981*; *GGETA 2004*; and *CCA 2017* include legally binding criteria for holding emitters legally accountable for their emissions. This is an important level of enforcement, making the system transparent and predictable. It is clear from the history of climate policy that Norway plays an

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<[http://unfccc.int/files/national\\_reports/annex\\_i\\_natcom/submitted\\_natcom/application/pdf/529371\\_norway-nc7-br3-1-nc7\\_-\\_br3\\_-\\_final.pdf](http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/529371_norway-nc7-br3-1-nc7_-_br3_-_final.pdf)>.

<sup>294</sup> *Climate Change Act 2017* (Norway) s 5.

<sup>295</sup> *Climate Change Act 2017* (Norway) s 5.

<sup>296</sup> *Climate Change Act 2017* (Norway) s 6.

<sup>297</sup> *Climate Change Act 2017* (Norway) s 3 and 4.

active role in the international arena. Norway safeguards itself by being a leader in the fossil fuel industry.

The market-based instruments (carbon tax and ETS) also demonstrate the ability to reduce emissions. These instruments work as a pathway to climate sustainability and towards achieving the *PA* targets. Norway has shown its willingness to pay for its emissions,<sup>298</sup> closely following the 'polluter pays' principle, which can be seen through its carbon taxation system and ETS. About 80% of Norway's GHGe are regulated by carbon taxes or the Norwegian / EU ETS, or both.<sup>299</sup> It is said that Norway's GHGe would be 10-15% higher than what they are currently if there were no carbon tax or ETS.<sup>300</sup> A command and control approach, strict legislation, and a flexible trading scheme have helped Norway to stabilise its level of emissions. GHGe in Norway are also stable due to its oil fields reaching maturity and declining, with reducing levels of production and an economic downturn.

In order to achieve the 2°C goal, no more than one third of the fossil fuel reserves can be used before 2050.<sup>301</sup> A gradual phase-out of fossil fuel production moving towards RE could be a solution. Norway is rich with hydropower making it easy to generate electricity, as opposed to Australia which generates most electricity from the burning of coal. Also, using CCS could reduce net GHGe from the fossil fuel industry. Norway has been researching and investing in CCS since 1996. The usage of RE and gas for processing in the fossil fuel industry is helping the fossil fuel industry to modestly reduce emissions.<sup>302</sup>

Norway has made modest GHGe reductions so far but is not on track to achieve the *PA* target, which is to reduce GHGe by at least 40% below 2005 levels by 2030. This raises the question as to whether the current mitigation instruments and legislation can help Norway to reach its *PA* targets. The *CCA 2017* may make a difference but it is too early to say.

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<sup>298</sup> S. Andresen and S. Hals Butenschøn, 'Nowegian Climate Policy: From Pusher to Laggard?' (2001) 1 *Law and Economics* 337, 352.

<sup>299</sup> United Nations Framework Convention on Climate Change, *Talanoa-dialogue: Norway* (Web Page, 2 April 2018) 1  
<[https://unfccc.int/sites/default/files/resource/119\\_TalanoaSubmissionNorway1apr2018END\\_rev.pdf](https://unfccc.int/sites/default/files/resource/119_TalanoaSubmissionNorway1apr2018END_rev.pdf)>.

<sup>300</sup> United Nations Framework Convention on Climate Change, *Talanoa-dialogue: Norway* (Web Page, 2 April 2018) 2  
<[https://unfccc.int/sites/default/files/resource/119\\_TalanoaSubmissionNorway1apr2018END\\_rev.pdf](https://unfccc.int/sites/default/files/resource/119_TalanoaSubmissionNorway1apr2018END_rev.pdf)>.

<sup>301</sup> International Energy Agency, *World Energy Outlook 2012: Executive Summary* (Report, 2012) 3  
<[http://www.realinstitutoelcano.org/wps/wcm/connect/b09541804d9b4866bff7ff7bf08704f4/WEOutlook2012\\_eng.pdf?MOD=AJPERES&CACHEID=b09541804d9b4866bff7ff7bf08704f4](http://www.realinstitutoelcano.org/wps/wcm/connect/b09541804d9b4866bff7ff7bf08704f4/WEOutlook2012_eng.pdf?MOD=AJPERES&CACHEID=b09541804d9b4866bff7ff7bf08704f4)>.

<sup>302</sup> Energy Facts Norway, *The Norwegian Energy System* (Web Page)  
<<https://energifaktanorge.no/en/>>.

## Conclusion

This chapter reviewed the background and the evolution of legislation and policy in Norway, explaining the carbon tax and ETS. Norway's carbon tax and ETS are a fusion of instruments creating a 'hybrid system' to reduce GHGe. Significant preference is shown towards market-based instruments rather than command and control regulation.<sup>303</sup> Understandably, pricing carbon remains a major challenge to reduce GHGe. The Norwegian approach focuses on promoting solutions to impact on a global scale instead of just achieving domestic GHGe reduction targets.<sup>304</sup> Recently, it has been reported that the Norwegian Global Pension Fund will cease investing in coal after the Norwegian Parliament approved tighter rules.<sup>305</sup> The divestment from coal could be because Norway is promoting its gas industry to reduce global emissions by displacing coal.

As petroleum activities represent the largest source of CO<sub>2</sub> emissions in Norway, 'double regulation' is needed in this area. Further, the Norwegian Continental Shelf (NCS) petroleum industry is maturing, resulting in increasing emissions per unit extracted. Europe is the main importer of oil and gas from Norway. If European countries replace coal with gas, Norway's GHGe will continue to rise, making it difficult to achieve its *PA* targets. This move may trigger the birth of new climate policies.

The three Acts: *PCA 1981*; *GGETA 2004*; and *CCA 2017* hold emitters legally accountable for their emissions. The carbon tax and ETS set the framework for investing in RE and CCS. Norway appears to be doing better than Australia in limiting GHGe despite being actively involved in the fossil fuel industry. However, it is not actually meeting its international promises. The examination of climate legislation and policy in Norway establishes a framework leading to comparative discussion in Chapters 4-6. This will show how Norway is maintaining a lower, and slightly reducing, level of GHGe while being actively involved in the fossil fuel industry.

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<sup>303</sup> S.E. Weishaar, *Emissions Trading Design: A Critical Overview* (Edward Elgar Publishing, 2014) 12.

<sup>304</sup> R. K. W. Wurzel et al (eds), *The European Union in International Climate Change Politics*, (Routledge, 2016) 189.

<sup>305</sup> Stephanie Chalmers, 'Norway's \$US1 trillion sovereign wealth fund to dump billions in coal investments', *ABC News* (Web Page, 13 June 2019) <<https://www.abc.net.au/news/2019-06-13/norway-sovereign-wealth-fund-to-ditch-billions-in-coal-stakes/11205134>>.

## *Chapter 4: Comparison of Norway's Carbon Tax and Emissions Trading Scheme with Australia's Carbon Pricing Mechanism*

### **Introduction**

This Chapter highlights the differences between the Norwegian carbon tax and emissions trading scheme (ETS) and Australia's carbon pricing mechanism (CPM). It is a unique comparison because there are some valuable lessons to be learned. The rationale of doing this is to understand what Australia can further learn about re-introducing a price on carbon. The comparison may seem unusual at first glance. Although there are different mechanisms used in both countries to reduce greenhouse gas emissions (GHGe), the differences in terms of both instruments design features are worth analysing. This is because Norway's oil and gas production are higher than Australia, but GHGe are substantially lower compared to Australia. Also, while the countries are different geographically and climatically, the Norwegian experience is, nonetheless, worth discussing as there are some specific features to warrant the comparison. This thesis will discuss general proposals for reform without detailed discussion of historical and current political and economic circumstances.

Norway had a functioning domestic carbon tax from 1991 and an ETS as early as 2005, which was linked to the EU ETS in 2008. Besides a carbon tax, the ETS is one of the mechanisms helping Norway to maintain or modestly reduce its GHGe. This chapter will address how the ETS is helping Norway in reducing GHGe and what significant design features does it have in comparison with the proposed Australian ETS.

As explained in Chapters 2 and 3, Australia was about to have an ETS that was not implemented due to a change of Government. Norway had been more progressive and had a functioning domestic ETS for more than a decade. This Chapter will analyse a direct comparison of the Australian equivalent 'carbon tax' and the Norwegian carbon tax, and the proposed Australian ETS and the current Norwegian ETS experiences. This chapter will not comment on the economics of emissions trading. This chapter will summarise the lessons learnt from the comparison of Australia and Norway and discuss the viability/feasibility of re-introducing a carbon tax and/or ETS in Australia.

## 1.0 Carbon Tax and Emissions Trading Scheme Design Features

This section provides a basic comparison of a carbon tax and ETS design features. It then highlights the Australian CPM features which includes an equivalent 'carbon tax' component and an ETS component in Section 1.2.

### 1.1 Comparison of the Carbon Tax and Emissions Trading Scheme Design Features

Each instrument, a carbon tax and an ETS, has certain basic design features of its own comprising of its functions, scope, price or cap, price stability, point of regulation, enforcement, risk mitigation, cross border linkage, flexibility, administration, cost, government intervention and perception. The discussion below explains the differences of a carbon tax and an ETS design features.<sup>1</sup>

A carbon tax and an ETS are similar in one sense: both are regulated by the Government and increase Government revenue. Both an ETS and a carbon tax aim at reducing emissions and apply to upstream,<sup>2</sup> downstream<sup>3</sup> and midstream<sup>4</sup> production activities. However, there are substantial differences between the design features of a carbon tax and an ETS, which make the two mechanisms distinct from each other.

A significant difference between a carbon tax and an ETS lies in terms of its function. The former sets a price on carbon without a cap on emissions, while the latter sets a cap on total emissions and, usually, requires emitters to pay for a permit price for each tonne of CO<sub>2</sub>

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<sup>1</sup> For easier understanding of the carbon tax and emissions trading scheme, the differences are presented in a tabular form in Appendix A. Also refer to Chapter 1, section 2.0.

<sup>2</sup> 'The upstream petroleum (oil and gas) sector encompasses exploration and appraisal, development and construction, and production. For natural gas and LPG, the definition of upstream includes processing and delivery to export terminals or domestic gas transmission pipeline in take.' Source: Australian Government Productivity Commission, Parliament of Australia, *Review of Regulatory Burden on the Upstream Petroleum (Oil and Gas) Sector* (Research Report, April 2009) XVI <<https://www.pc.gov.au/inquiries/completed/upstream-petroleum/report/upstream-petroleum.pdf>>.

<sup>3</sup> Downstream connotes 'industry operations beyond the initial extraction and processing stages including refining and marketing - opposite to upstream.' Source: Australian Government Productivity Commission, Parliament of Australia, *Review of Regulatory Burden on the Upstream Petroleum (Oil and Gas) Sector* (Research Report, 2009) XVIII <<https://www.pc.gov.au/inquiries/completed/upstream-petroleum/report/upstream-petroleum.pdf>>.

<sup>4</sup> The midstream industry 'processes, stores, markets and transports commodities such as crude oil, natural gas, natural gas liquids (NGLs, mainly ethane, propane and butane) and sulphur.' Source: PSAC, *Industry Overview* (Web Page) <<http://www.pvac.ca/business/industry-overview/>>.

emitted.<sup>5</sup> Carbon taxes focus on the emissions output (i.e the amount of GHGe emitted).<sup>6</sup> In theory, the amount of tax affects the level of emissions and, so, may be raised to reduce emissions. The ETS cap on emissions may affect the price for permits and so may be adjusted if the price is perceived to be too high.

A carbon tax provides a level of certainty on the price of emissions (i.e on the costs of compliance) as the tax rate is set by the Government but does not provide environmental certainty (i.e. does not set a cap on emissions and as such, the reductions in GHGe cannot be determined). In contrast, an ETS provides environmental certainty but the price of carbon fluctuates as the price is determined by the market leaving the cost of compliance to be determined by market forces.<sup>7</sup>

An ETS does not set a fixed price on carbon; instead, the price is determined by the market, as opposed to a carbon tax where the tax rate is set by the Government. Besides that, an ETS sets an initial cap on emissions which is tightened over time. In contrast, there is no cap on emissions in a carbon tax. The former requires allowances to be allocated to the participants either for free or through an auction. Meanwhile, under a carbon tax regime, there are no allowances issued to the participants.

A carbon tax is easier to enforce and monitor as opposed to an ETS, which requires extensive reporting of emissions and surrendering of allowances according to those emissions.<sup>8</sup> Another difference is that an ETS allows trading of permits, while trading is not permitted under a carbon tax. In terms of mitigating risk, an ETS can include a price ceiling, price floor, and banking and borrowing of allowances. By comparison, a carbon tax has lower risk on price and the Government can adjust the rate of tax to make it easier to comply with. The tax generated can be used for social benefits by giving subsidies.

An ETS has some advantages. It provides the opportunity of cross border linking; this is impractical under a carbon tax due to different legal systems. The ETS has a more certain

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<sup>5</sup> Zahar, Peel and Godden, *Australian Climate Law in Global Context* (Cambridge University Press, 2013) 171.

<sup>6</sup> The Climate Reality Project, '2017 Handbook on Carbon Pricing Instruments' (Web Page, 2017) 15 <[https://www.climaterealityproject.org/sites/clinaterealityproject.org/files/HandbookonCarbonFinancing\\_Final\\_May16.pdf](https://www.climaterealityproject.org/sites/clinaterealityproject.org/files/HandbookonCarbonFinancing_Final_May16.pdf)>.

<sup>7</sup> The Climate Reality Project, '2017 Handbook on Carbon Pricing Instruments' (Web Page, 2017) 24 <[https://www.climaterealityproject.org/sites/clinaterealityproject.org/files/HandbookonCarbonFinancing\\_Final\\_May16.pdf](https://www.climaterealityproject.org/sites/clinaterealityproject.org/files/HandbookonCarbonFinancing_Final_May16.pdf)>.

<sup>8</sup> The Climate Reality Project, '2017 Handbook on Carbon Pricing Instruments' (Web Page, 2017) 23 <[https://www.climaterealityproject.org/sites/clinaterealityproject.org/files/HandbookonCarbonFinancing\\_Final\\_May16.pdf](https://www.climaterealityproject.org/sites/clinaterealityproject.org/files/HandbookonCarbonFinancing_Final_May16.pdf)>.

outcome on emissions reduction as a cap is set on the CO<sub>2</sub> emissions. The outcome on emissions reduction under a carbon tax is less certain because there is no cap on emissions. The two mechanisms are flexible: an ETS is flexible as the supply of emissions can be adjusted; the carbon tax is flexible as the tax rate can be adjusted.

A carbon tax is easier to administer as opposed to an ETS which is more complex. In terms of cost, it is difficult to estimate the cost incurred under an ETS as estimation is based on emissions and allowance prices. In contrast, it is easier to estimate the cost incurred under a carbon tax as the estimation is based on the tax rate multiplied by the monitored/reported volume. Government intervention is higher under a carbon tax, and less under an ETS. As a result of these differences, an ETS is generally well perceived by Government and industry as opposed to a carbon tax.

### *1.2 Australian Carbon Pricing Mechanism Features*

This section will discuss the features of the Australian CPM. When the CPM was introduced in 2011, the Prime Minister during that term, Julia Gillard, stated that the CPM was not a carbon tax. However, the statement made by Gillard was not entirely correct given how the CPM functioned. The Australian CPM had two components, an equivalent 'carbon tax' and an ETS. It had a threshold figure of 25,000 tonnes of CO<sub>2</sub>-e per entity before the entity became subject to the Australian ETS.<sup>9</sup> The threshold figure was not applicable to the equivalent 'carbon tax' component of the CPM, instead it applied only to the ETS component.

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<sup>9</sup> *Clean Energy Act* s 20(4)(b) (repealed); *National Greenhouse and Energy Reporting Act 2007* (Cth) s 13(1)(d)(i).

**Table 2: Coverage of the Carbon Pricing Mechanism<sup>10</sup>**

**TABLE 13.1: COVERAGE OF THE CARBON PRICING MECHANISM**

CARBON PRICING MECHANISM	EQUIVALENT CARBON PRICE	NO CARBON PRICE <sup>2</sup>
Emissions above the annual 25 kt CO <sub>2</sub> -e threshold from: <ul style="list-style-type: none"> <li>• electricity generation</li> <li>• direct combustion<sup>1</sup></li> <li>• industrial processes</li> <li>• waste deposited since July 2012</li> <li>• fugitive emissions.</li> </ul>	Transport fuels used for: <ul style="list-style-type: none"> <li>• domestic aviation</li> <li>• marine transport</li> <li>• rail transport</li> <li>• business in off-road transport</li> <li>• non-transport business uses.</li> </ul> Synthetic greenhouse gases.	Emissions from: <ul style="list-style-type: none"> <li>• agriculture</li> <li>• LULUCF</li> <li>• waste deposited before July 2012</li> <li>• fugitive emissions from decommissioned mines</li> <li>• conventional road transport</li> <li>• entities in sectors covered by the carbon pricing mechanism that fall below the 25 kt CO<sub>2</sub>-e threshold</li> </ul>

**Notes:** (1) Direct combustion excludes diesel, which is covered by the equivalent carbon price (unless opted in). (2) Sources in the agriculture, land and waste sectors are eligible to create carbon offsets under the CFI.

There are a few important points to note from the table above. The CPM was primarily seen as the ETS covering stationary sources of emissions as stated in the first column from the left applying to power stations, other stationary electricity generation sources, fugitive emissions, industrial processes, transportation and landfill sectors.<sup>11</sup> Emissions from these sources are easier to measure. A few sectors were exempted from this scheme: agriculture, transport fuel industries, and small businesses.<sup>12</sup>

The second column which is the ‘equivalent carbon price’, was the ‘carbon tax’ element of the package. It was applied to mobile sources of GHGe, mainly transport systems using fuels. The design of the legislation was to set a tax that would price carbon at a similar level to the ETS scheme covering stationary sources. The CPM was designed in this way as emissions from mobile sources are harder to measure.

The third column was labelled ‘no carbon price’ because the measurement of emissions was more difficult due to the diffuse nature of the sources and sinks, especially

<sup>10</sup> Australian Government Climate Change Authority, Parliament of Australia, *Reducing Australia’s Greenhouse Gas Emissions – Targets and Progress Review* (Final Report, February 2014) 190 <<http://www.climatechangeauthority.gov.au/files/files/Target-Progress-Review/Targets%20and%20Progress%20Review%20Final%20Report.pdf>>.

<sup>11</sup> Multi-Party Climate Change Committee, Australian Government, *Multi-Party Climate Change Committee Clean Energy Agreement 1*, 7 <[https://www.pfpi.net/wp-content/uploads/2011/07/mpccc\\_cleanenergy\\_agreement-pdf.pdf](https://www.pfpi.net/wp-content/uploads/2011/07/mpccc_cleanenergy_agreement-pdf.pdf)>.

<sup>12</sup> Greg Combet, *Securing a Clean Energy Future: Implementing the Australian Government’s Climate Change Plan* (CanPrint Communications Pty Ltd, 2012) 8 <[https://archive.budget.gov.au/2012-13/ministerial\\_statements/ms\\_climate\\_change.pdf](https://archive.budget.gov.au/2012-13/ministerial_statements/ms_climate_change.pdf)>.



from agriculture and land use. The Carbon Farming Initiative applied to emissions from the agriculture sector.<sup>13</sup> This area will not be discussed further, as it is beyond the scope of this thesis.

The Australian CPM was designed as a unique, hybrid mechanism. The equivalent 'carbon tax' component of the Australian CPM bore a few differences in its design features when compared with the Norwegian carbon tax which is discussed in the next section.

## **2.0 Comparison of Australia's Equivalent 'Carbon Tax' and the Norwegian Carbon Tax**

This section will discuss the differences between Australia's equivalent 'carbon tax' and the Norwegian carbon tax. The sections below discuss these differences in terms of its price, continuity, implementing legislation, greenhouse gas coverage, sector coverage, implementing agencies, and penalty for non-compliance.<sup>14</sup>

### *2.1 Carbon Tax Element of Carbon Price*

The Australian carbon price was fixed at AUD23 per tonne of CO<sub>2</sub>-e emitted between 2012 and 2014<sup>15</sup> and during that time permits were not tradeable. Excise rates for fuel applied. The carbon emission rates from transport fuels were calculated and was set at an equivalent price per tonne of CO<sub>2</sub>.<sup>16</sup> The *Clean Energy Act 2011* (Cth) (repealed) (*CEA 2011*) provided for an 'opt-in scheme' which enabled large users of fuel to opt in voluntarily to the CPM effective from 1 July 2013.<sup>17</sup> This provided large users of fuel to save a little as opposed to paying the equivalent carbon price under the fuel tax and excise system. In contrast, the Norwegian carbon tax is heavily priced which started at USD40.10 per tonne of CO<sub>2</sub>-e emitted.<sup>18</sup> Large users of fuel are also subjected to the heavy carbon tax making it expensive to pollute.

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<sup>13</sup> The relevant legislation on Carbon Farming Initiative is the *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth) as amended in 2014.

<sup>14</sup> For easier understanding of the Australian equivalent 'carbon tax' and the Norwegian carbon tax, the differences are presented in a tabular form in Appendix B.

<sup>15</sup> *Clean Energy Act 2011* (Cth) s 100 (repealed).

<sup>16</sup> *Clean Energy (Fuel Tax Legislation Amendment) Act 2011* (Cth) s 43-8; *Clean Energy (Excise Tariff Legislation Amendment) Act 2011* (Cth).

<sup>17</sup> *Clean Energy Act 2011* (Cth) s 19, 30 and 92A (repealed).

<sup>18</sup> Richard Baron, 'Economic/Fiscal Instruments: Taxation' (Working Paper No. 4, Organisation for Economic Co-operation and Development, 1997) 32  
<<http://www.oecd.org/environment/cc/2392474.pdf>>.

## 2.2 Implementing Legislation

The *CEA 2011* was the implementing legislation of the Australian equivalent 'carbon tax'. Meanwhile, *CO<sub>2</sub> Tax Act 1991*<sup>19</sup> is the implementing legislation of the Norwegian carbon tax. However, the Australian equivalent 'carbon tax' was repealed in 2014; while the Norwegian carbon tax is still operational.

## 2.3 Greenhouse Gas Coverage

In terms of greenhouse gas coverage, all direct scope 1 emissions: (carbon dioxide, methane, nitrous oxide, sulphur hexafluoride, hydrofluorocarbon, and perfluorocarbon) were covered under the Australian equivalent 'carbon tax'.<sup>20</sup> The Norwegian carbon tax only covers carbon dioxide.

## 2.4 Sector Coverage

The Australian equivalent 'carbon tax' covered mobile sources mainly transport fuels from domestic aviation, marine and rail transport, business in off-road transport, and non-transport business uses.<sup>21</sup> The Norwegian carbon tax, on the other hand, applies to the production of oil and gas: (a) this tax is charged on petroleum that is burnt and natural gas discharged into the air; (b) CO<sub>2</sub> that is separated from petroleum and discharged into the air; and (c) installations related with the production or transportation of petroleum.<sup>22</sup>

The Norwegian carbon tax also applies to heating oil, diesel, gasoline, liquefied petroleum gas (LPG), and natural gas. However, GHGe from the processing industries, agriculture, international air and maritime transport, fishing in distant waters, freight and passenger transport within the domestic shipping sector were exempted from this tax.<sup>23</sup>

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<sup>19</sup> Act 21 December 1990 no. 72 relating to tax on discharge of CO<sub>2</sub> in the petroleum activities on the continental shelf.

<sup>20</sup> *Clean Energy Act 2011* (Cth) s 5 (repealed); *National Greenhouse and Energy Reporting Act 2007* (Cth) s 7A.

<sup>21</sup> Australian Government Climate Change Authority, Parliament of Australia, *Reducing Australia's Greenhouse Gas Emissions – Targets and Progress Review* (Final Report, February 2014) 190 <<http://www.climatechangeauthority.gov.au/files/files/Target-Progress-Review/Targets%20and%20Progress%20Review%20Final%20Report.pdf>>.

<sup>22</sup> *CO<sub>2</sub> Tax Act 1991* (Norway) s 2.

<sup>23</sup> Norwegian Ministry of the Environment, Parliament of Norway, *Norwegian Climate Policy: Summary in English: Report No. 54 to the Storting (2000-2001)* (Final Report, June 2001) 13 <<https://www.regjeringen.no/contentassets/91b54f03dc224f3397c95b04be350f49/en-gb/pdfs/stm200020010054000engpdfs.pdf>>; A. Bruvoll and B.M. Larsen, 'Greenhouse Gas Emissions in Norway: Do Carbon Taxes Work?' (2004) 32 *Energy Policy* 493, 498.

## *2.5 Implementing Agencies*

The equivalent 'carbon tax' was administered by the Clean Energy Regulator and the Climate Change Authority. The Norwegian carbon tax is administered by the Norwegian Petroleum Directorate.

## *2.6 Penalty for Non-Compliance*

If emitters did not comply with the Australian equivalent 'carbon tax' or do not comply with the Norwegian carbon tax, a penalty would apply. There would be civil penalties for non-compliance with the former, and, for the latter, fines and up to three months imprisonment.<sup>24</sup>

The two mechanisms (carbon tax and ETS) are distinct from each other in terms of their function and design features. It is useful to consider the differences because there are distinct lessons to be learned from each mechanism which is discussed in section 4.0. The next part of this chapter compares the Australian and Norwegian ETSs.

## **3.0 Comparison of The Australian and Norwegian Emissions Trading Schemes**

This section will discuss and analyse the main design differences between the Australian ETS (proposed and now repealed) and the current Norwegian ETS which is linked to the European Union Emissions Trading Scheme (EU ETS). This is to understand how the proposed Australian ETS could potentially be strengthened, if implemented in the future. Some of the main design features will be discussed in more detail in the sections below. My tabulation and characterization of the two schemes in tabular form is attached in Appendix C.

The discussion below offers a comparison of the design features of both ETS, in terms of its validity (time started and ended operation), price ceiling and price floor, greenhouse gas coverage, sector coverage, threshold figure and cap, allocation of allowances, banking, borrowing, limits on foreign allowances, use of other domestic offsets or credits, the governing body, implementing legislation, penalty for non-compliance, Market Stability Reserve (MSR),<sup>25</sup> leakage control of allowance, and possible linking with other greenhouse gas trading systems. Significant design features will be discussed in more detail in sections 3.1-3.9.

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<sup>24</sup> *CO<sub>2</sub> Tax Act 1991* (Norway) s 7.

<sup>25</sup> This is a mechanism to balance the existing surplus of allowances. MSR has been explained in Chapter 3 section 2.5.1(c)(i).

The Australian ETS was to start on 1 July 2015. However, it was repealed.<sup>26</sup> The Norwegian ETS on the other hand, is still ongoing as it is linked to the EU ETS.<sup>27</sup> The proposed Australian ETS set a fixed price of AUD23 per tonne of CO<sub>2</sub>-e as of July 2012 for the first three years and subsequently, AUD20 per tonne of CO<sub>2</sub>-e between 2015-2018 rising 5% annually.<sup>28</sup> The carbon price was to be determined by the market from 1 July 2015 under the Australian ETS. By comparison, the Norwegian/EU ETS carbon price was determined by the market at the start itself. The carbon price for Phase I (2005-2007) of the Norwegian/EU ETS was between EUR20-30,<sup>29</sup> Phase II (2008-2012) was between EUR8-30,<sup>30</sup> and Phase III (2013-2020) was EUR15.82 (an average price of 2018)<sup>31</sup>.

In terms of the governing body, the Australian ETS was governed by the Clean Energy Regulator, Climate Change Authority and Productivity Commissions. The Norwegian ETS which is linked to the EU ETS is administered by the European Commission. The *CEA 2011* was the main implementing legislation for the Australian ETS and *Directive 2003/87/EC*<sup>32</sup> for the Norwegian ETS (linked to the EU ETS).

In the event of non-compliance, a penalty or imprisonment applied under the Australian ETS. As for the Norwegian/EU ETS, a fee of EUR40 is applicable per tonne in Phase I<sup>33</sup> and EUR100 per tonne in Phase II<sup>34</sup>. The penalty rate for Phase III is not determined but will be increased from the earlier Phase according to the European index of consumer prices.<sup>35</sup>

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<sup>26</sup> Zahar, Peel and Godden, *Australian Climate Law in Global Context* (Cambridge University Press, 2013) 193. This is explained in Chapter 2 section 2.5.

<sup>27</sup> The linkage with the EU ETS is explained in Chapter 3 section 2.5.2(d).

<sup>28</sup> *Clean Energy Act 2011* (Cth) s 100 (repealed).

<sup>29</sup> The Oxford Institute of Energy Studies, *The EU ETS Phase IV Reform: Implications for System Functioning and for the Carbon Price Signal* (September 2018) 3  
<<https://www.oxfordenergy.org/wpcms/wp-content/uploads/2018/09/The-EU-ETS-phase-IV-reform-implications-for-system-functioning-and-for-the-carbon-price-signal-Insight-38.pdf>>.

<sup>30</sup> Environmental Defense Fund, 'European Union: An Emissions Trading Case Study' (Web Page) 14  
<[https://www.ieta.org/resources/Resources/Case\\_Studies\\_Worlds\\_Carbon\\_Markets/euets\\_case\\_study\\_may2015.pdf](https://www.ieta.org/resources/Resources/Case_Studies_Worlds_Carbon_Markets/euets_case_study_may2015.pdf)>.

<sup>31</sup> International Carbon Action Partnership, 'EU Emissions Trading System (EU ETS)' (Web Page, 8 January 2020) 2  
<[https://icapcarbonaction.com/en/?option=com\\_etsmap&task=export&format=pdf&layout=list&system%5B%5D=43](https://icapcarbonaction.com/en/?option=com_etsmap&task=export&format=pdf&layout=list&system%5B%5D=43)>.

<sup>32</sup> *Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC [2003] OJ C 75E/33 ('Directive 2003/87/EC').*

<sup>33</sup> *Directive 2003/87/EC* art 16(4).

<sup>34</sup> *Directive 2003/87/EC* art 16(3).

<sup>35</sup> *Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community [2009] OJ L 140/63, art 1(20).*

Besides the penalty, there is also a 'name and shame' sanction.<sup>36</sup> Member States can publish the names of operators who breach the requirements of surrendering allowances.<sup>37</sup>

As for limits on the use of foreign allowances, the Australian ETS would have permitted 50% foreign allowances and fully 100% from 2020 onwards, and 12.5% of the *Kyoto Protocol* (KP) units.<sup>38</sup> The Norwegian/EU ETS allows the use of international credits from the Clean Development Mechanism and Joint Implementation under the KP.<sup>39</sup>

As for other domestic offsets or credits, the Australian ETS recognised the Australian Carbon Credit Units (ACCU) under the Carbon Farming Initiative. In comparison, under the Norwegian/EU ETS, Phase I permitted unlimited use of Clean Development Mechanism credits and Joint Implementation credits as provided in the Directive.<sup>40</sup> However, in practice, no credits were used. Phase II allowed the use of credits up to a certain percentage as stated in each country's National Allocation Plan (NAP), while Phase III allowed the total use of credits for Phase II and III which may amount to 50% of the overall reduction.<sup>41</sup> Phase IV does not envisage the use of offsets.<sup>42</sup>

Another distinct feature between the Australian ETS and the Norwegian/EU ETS is the existence of a MSR.<sup>43</sup> This system started in the EU ETS in January 2019 to balance the

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<sup>36</sup> European Commission, European Union, *EU ETS Handbook* (2015) 134  
<[https://ec.europa.eu/clima/sites/clima/files/docs/ets\\_handbook\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/ets_handbook_en.pdf)>

<sup>37</sup> *Directive 2003/87/EC* art 16(2).

<sup>38</sup> Environmental Defense Fund, 'Australia The World's Carbon Markets: A Case Study Guide to Emissions Trading', (Web Page, May 2013) 6  
<[https://www.edf.org/sites/default/files/EDF\\_IETA\\_Australia\\_Case\\_Study\\_May\\_2013.pdf](https://www.edf.org/sites/default/files/EDF_IETA_Australia_Case_Study_May_2013.pdf)>.

<sup>39</sup> *Directive 2004/101/EC of the European Parliament and of the Council of 27 October 2004 amending Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community, in respect of the Kyoto Protocol's project mechanism's* [2004] OJ L 338/18; International Carbon Action Partnership, 'EU Emissions Trading System (EU ETS)', (Web Page, 08 January 2020)  
<[https://icapcarbonaction.com/en/?option=com\\_etsmap&task=export&format=pdf&layout=list&systems%5B%5D=43](https://icapcarbonaction.com/en/?option=com_etsmap&task=export&format=pdf&layout=list&systems%5B%5D=43)>.

<sup>40</sup> International Carbon Action Partnership, 'EU Emissions Trading System (EU ETS)', (Web Page, 08 January 2020)  
<[https://icapcarbonaction.com/en/?option=com\\_etsmap&task=export&format=pdf&layout=list&systems%5B%5D=43](https://icapcarbonaction.com/en/?option=com_etsmap&task=export&format=pdf&layout=list&systems%5B%5D=43)>.

<sup>41</sup> International Carbon Action Partnership, 'EU Emissions Trading System (EU ETS)', (Web Page, 08 January 2020)  
<[https://icapcarbonaction.com/en/?option=com\\_etsmap&task=export&format=pdf&layout=list&systems%5B%5D=43](https://icapcarbonaction.com/en/?option=com_etsmap&task=export&format=pdf&layout=list&systems%5B%5D=43)>.

<sup>42</sup> International Carbon Action Partnership, 'EU Emissions Trading System (EU ETS)', (Web Page, 08 January 2020)  
<[https://icapcarbonaction.com/en/?option=com\\_etsmap&task=export&format=pdf&layout=list&systems%5B%5D=43](https://icapcarbonaction.com/en/?option=com_etsmap&task=export&format=pdf&layout=list&systems%5B%5D=43)>.

<sup>43</sup> *Decision (EU) 2015/1814 of the European Parliament and of the Council of 06 October 2015 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading scheme and amending Directive 2003/87/EC* [2015] OJ L 264/1.

existing surplus of allowances, which is not applicable under the Australian ETS. In order to control the leakage of allowances, the Norwegian/EU ETS included the sectors that are exposed to risk of carbon leakage on an official list. A formula<sup>44</sup> is used to calculate the amount of free allowances. Under the Australian ETS, trade exposed industries were given concessions to avoid the leakage of allowances.

In terms of linking with other greenhouse gas trading systems, both systems allowed it. The Australian ETS allowed linking from the flexible carbon price period. This means linking was to be allowed after 3 years of fixed carbon price. The significant differences between the Australian ETS (proposed and now repealed) and the Norwegian/EU ETS design features comprising threshold figure and cap, price ceiling, greenhouse gas coverage, sector coverage, allocation of allowances, banking, borrowing, mechanism to address the surplus of allowances, and linking with other systems are explained below.

### *3.1 Threshold Figure and Cap*

The Australian ETS sets a threshold figure of 25,000 tonnes of CO<sub>2</sub> for all the sectors covered under the scheme (sector coverage is discussed in section 3.4).<sup>45</sup> When a facility<sup>46</sup> emits scope 1<sup>47</sup> GHGe over the threshold, it would have to surrender eligible emissions units<sup>48</sup> and pay for each tonne of CO<sub>2</sub> emitted above the threshold figure. In contrast, under the Norwegian/EU ETS, the threshold is set based on the sector. Stationary installations and the aviation sector have different thresholds applicable to them. Stationary installations are categorised into three categories (small, medium, and large emitters) with different thresholds applying to each category:

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<sup>44</sup> The formula is 'production quantity (in tonnes of product) is multiplied with the benchmark value for that particular product (measured in emissions per tonne of product)'. Source: European Commission, *Carbon Leakage* (Web Page)

<[https://ec.europa.eu/clima/policies/ets/allowances/leakage\\_en](https://ec.europa.eu/clima/policies/ets/allowances/leakage_en)>.

<sup>45</sup> *National Greenhouse and Energy Reporting Act 2007* (Cth) s 13(1)(d)(i). The 25,000 tonnes of CO<sub>2</sub>-e is the size of the emissions entity that would be caught by the National Greenhouse and Energy Reporting Scheme reporting and the ETS.

<sup>46</sup> *National Greenhouse and Energy Reporting Act 2007* (Cth) s 9 provides that a facility is 'an activity or series of activities (including ancillary activities), that involve greenhouse gas emissions, the production of energy or the consumption of energy and that: (a) form a single undertaking or enterprise and meet the requirements of the regulations; or (b) are declared by the Regulator to be a facility under Section 54 or 54A.'

<sup>47</sup> Scope 1 emissions are 'the emissions released to the atmosphere as a direct result of an activity, or series of activities at a facility level.' Source: Australian Government Clean Energy Regulator, *Greenhouse Gases and Energy* (Web Page, 20 July 2018)  
<<http://www.cleanenergyregulator.gov.au/NGER/About-the-National-Greenhouse-and-Energy-Reporting-scheme/Greenhouse-gases-and-energy>>.

<sup>48</sup> According to Clean Energy Act 2011 (Cth) s 5, 'eligible emissions unit' means: '(a) a carbon unit; or (b) an eligible international emissions unit; or (c) an eligible Australian carbon credit unit.'

- (1) category A installation – average annual emissions are equal to or less than 50,000 tonnes of CO<sub>2</sub>-e;
- (2) category B installation – average annual emissions are between 50,000 tonnes of CO<sub>2</sub>-e – 500,000 tonnes of CO<sub>2</sub>-e;
- (3) category C installation – average annual emissions are more than 500,000 tonnes of CO<sub>2</sub>-e.<sup>49</sup>

Each installation and aircraft operator are required to have an approved monitoring plan to report and monitor annual emissions.<sup>50</sup> The level of reporting for each category is different. Category A installations face lesser reporting rules and are subject to Annex I of the *Commission Regulation No 601/2012*,<sup>51</sup> while category B and C installations face stricter reporting rules. Category A installations have to report every four years, while category B installations every two years, and category C installations have to report every year.<sup>52</sup> As for the aviation sector, the threshold is calculated based on the methodologies provided in Annex II and III of the *Commission Regulation No 601/2012*.<sup>53</sup> The calculations for the threshold figure would not be discussed further as it is beyond the scope of the thesis.

As for the cap, the emissions were not capped across the economy by the *CEA 2011* under the Australian ETS. The cap was to be set from 2018 onwards and the cap setting was left to the regulations under the *CEA 2011*.<sup>54</sup> The cap in Australia was to be set five years in advance.<sup>55</sup> This was done to provide businesses with a level of certainty and ability to plan for their future. When there was no regulation on the prescribed cap made, default caps would take effect.<sup>56</sup> At the outset, the Australian ETS was not a cap and trade scheme; it was proposed to become a cap and trade scheme when it transited to an ETS after 3 years of a fixed carbon price.

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<sup>49</sup> *Commission Regulation (EU) No 601/2012 of 21 June 2012 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council* [2012] OJ L 181/30, art 19(2); European Commission, European Union, *EU ETS Handbook* (2015) 87 <[https://ec.europa.eu/clima/sites/clima/files/docs/ets\\_handbook\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/ets_handbook_en.pdf)>.

<sup>50</sup> European Commission, *Monitoring, reporting and verification of EU ETS emissions* (Web Page) <[https://ec.europa.eu/clima/policies/ets/monitoring\\_en#tab-0-0](https://ec.europa.eu/clima/policies/ets/monitoring_en#tab-0-0)>.

<sup>51</sup> *Commission Regulation (EU) No 601/2012 of 21 June 2012 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council* [2012] OJ L 181/30.

<sup>52</sup> *Commission Regulation (EU) No 601/2012 of 21 June 2012 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council* [2012] OJ L 181/30, art 69(1)(a)-(c).

<sup>53</sup> *Commission Regulation (EU) No 601/2012 of 21 June 2012 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council* [2012] OJ L 181/30.

<sup>54</sup> *Clean Energy Act 2011* (Cth) s 13 and 14 (repealed).

<sup>55</sup> *Clean Energy Act 2011* (Cth) s 16(1) (repealed).

<sup>56</sup> *Clean Energy Act 2011* (Cth) s 17 and 18 (repealed).

In comparison, the Norwegian/EU ETS is a cap and trade system from the time it commenced in 2005. Under Phases I and II of the EU ETS, the cap was based on the NAP of each Member State. In these Phases, the Member States had the freedom to decide the amount of EU emissions allowances to be issued. The majority of emissions allowances were allocated for free in Phase I (2005-2007) and II (2008-2012) and based on their historic emissions. This system created confusion leading to an oversupply of emissions allowances.

As a result, in Phase III (2013-2020) of the EU ETS, an overall (EU-wide) cap on GHGe was applied to all participants in the system, replacing the previous system of national caps.<sup>57</sup> This was done to enable the Member States to achieve the greenhouse gas reduction target in a more effective manner. In this Phase, the EU ETS placed a ceiling on the maximum amount of EU emissions allowances that would be issued. The reason behind the emissions cap was to guarantee that the total emissions are kept at the pre-defined level and do not rise above the cap. From Phase II onwards, the Norwegian ETS followed the EU ETS emissions cap: Phase I – 2,058 MtCO<sub>2</sub>-e; Phase II – 1,859 MtCO<sub>2</sub>-e; Phase III – 2,084 MtCO<sub>2</sub>-e (in 2019, 1,855 MtCO<sub>2</sub>-e after deducting 1.74% of the linear reduction factor (LRF)); and Phase IV – a LRF of 2.2% will be applicable.<sup>58</sup>

The EU-wide cap is tightened over time using the LRF.<sup>59</sup> The EU ETS legislation creates allowances which provides rights for participants under the scheme to emit GHGe equivalent to 1 tonne of CO<sub>2</sub>-e.<sup>60</sup> The number of allowances available depends on the cap that is set.<sup>61</sup> If a facility has insufficient allowances to surrender, then the facility must cut its emissions or buy allowances from other participants. If there are extra allowances, the facility can either keep the allowances for the next year or sell them to other participants. Over time, the cap is tightened and fewer allowances are issued.

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<sup>57</sup> Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community [2009] OJ L 140/63, art 9; European Commission, European Union, *EU ETS Handbook* (2015) 16 <[https://ec.europa.eu/clima/sites/clima/files/docs/ets\\_handbook\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/ets_handbook_en.pdf)>; European Commission, *Emissions Cap and Allowances* (Web Page) <[https://ec.europa.eu/clima/policies/ets/cap\\_en](https://ec.europa.eu/clima/policies/ets/cap_en)>.

<sup>58</sup> European Commission, European Union, *EU ETS Handbook* (2015) 19 <[https://ec.europa.eu/clima/sites/clima/files/docs/ets\\_handbook\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/ets_handbook_en.pdf)>; International Carbon Action Partnership, 'EU Emissions Trading System (EU ETS)', (Web Page, 08 January 2020) <[https://icapcarbonaction.com/en/?option=com\\_etsmap&task=export&format=pdf&layout=list&system%5B%5D=43](https://icapcarbonaction.com/en/?option=com_etsmap&task=export&format=pdf&layout=list&system%5B%5D=43)>.

<sup>59</sup> The LRF was discussed in Chapter 3 section 2.5.1(a).

<sup>60</sup> European Commission, European Union, *EU ETS Handbook* (2015) 16 <[https://ec.europa.eu/clima/sites/clima/files/docs/ets\\_handbook\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/ets_handbook_en.pdf)>.

<sup>61</sup> European Commission, European Union, *EU ETS Handbook* (2015) 16 <[https://ec.europa.eu/clima/sites/clima/files/docs/ets\\_handbook\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/ets_handbook_en.pdf)>.



### 3.2 Price Ceiling and Price Floor

The Australian CPM (both equivalent 'carbon tax' and ETS components) fixed the price of carbon at \$23 per tonne of CO<sub>2</sub> for 3 years from 2012, rising 2.5% every year.<sup>62</sup> During the fixed price phase, an unlimited number of permits would be available for purchase.<sup>63</sup> The rationale behind fixing the price for this phase was to ensure stability and predictability in the system.<sup>64</sup> The 'fixed price' acts as a 'safety valve' to maintain the price and to prevent emitters from unexpected compliance costs.<sup>65</sup>

From 1 July 2015 onwards, the price of carbon under the Australian ETS was to be determined by the carbon markets<sup>66</sup> following the cap and trade ETS, rising 5% annually (the flexible charge period). During that time, the carbon unit's lowest price would be \$15 and the price ceiling,<sup>67</sup> \$20.<sup>68</sup> The price ceiling is set to prevent the price from rising beyond the set level. A price floor on the other hand prevents prices from falling below a set level.<sup>69</sup> The price ceiling and price floor would act as a safety valve.<sup>70</sup>

The Australian ETS proposed that, effective from 1 July 2018, a floating price phase for the carbon price units were to be determined by the carbon markets.<sup>71</sup> The price ceiling and price floor was to apply for the first three years of the flexible period, meaning 2015-2018,

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<sup>62</sup> The price of carbon units is set starting at \$23 from 2012-2013, \$24.15 from 2013-2014, and \$25.40 from 2014-2015. Source: Multi-Party Climate Change Committee, Australian Government, *Multi-Party Climate Change Committee Clean Energy Agreement 4* <[https://www.pfpi.net/wp-content/uploads/2011/07/mpccc\\_cleanenergy\\_agreement-pdf.pdf](https://www.pfpi.net/wp-content/uploads/2011/07/mpccc_cleanenergy_agreement-pdf.pdf)>.

<sup>63</sup> Multi-Party Climate Change Committee, Australian Government, *Multi-Party Climate Change Committee Clean Energy Agreement 4* <[https://www.pfpi.net/wp-content/uploads/2011/07/mpccc\\_cleanenergy\\_agreement-pdf.pdf](https://www.pfpi.net/wp-content/uploads/2011/07/mpccc_cleanenergy_agreement-pdf.pdf)>.

<sup>64</sup> *Securing a clean energy future: The Australian Government's Climate Change Plan* (Report, 2011) 25 <<http://large.stanford.edu/courses/2012/ph240/aslani2/docs/CleanEnergyPlan-20120628-3.pdf>>.

<sup>65</sup> F. Jotzo and R. Betz, 'Australia's emissions trading scheme: opportunities and obstacles for linking' (2009) 9(4) *Climate Policy* 402, 405.

<sup>66</sup> D. Lockie, *Clean Energy Law in Australia* (LexisNexis Australia, 2012) 11.

<sup>67</sup> Price ceiling is a mechanism which reduces price volatility. It 'allows emitters to purchase unlimited allowances directly from the government at a ceiling price, effectively capping the trading price.' Source: The Climate Reality Project, '2017 Handbook on Carbon Pricing Instruments' (Web Page) 21 <[https://www.climatealityproject.org/sites/climatealityproject.org/files/HandbookonCarbonFinancing\\_Final\\_May16.pdf](https://www.climatealityproject.org/sites/climatealityproject.org/files/HandbookonCarbonFinancing_Final_May16.pdf)>.

<sup>68</sup> D. Lockie, *Clean Energy Law in Australia* (LexisNexis Australia, 2012) 11.

<sup>69</sup> The Climate Reality Project, '2017 Handbook on Carbon Pricing Instruments' (Web Page) 21 <[https://www.climatealityproject.org/sites/climatealityproject.org/files/HandbookonCarbonFinancing\\_Final\\_May16.pdf](https://www.climatealityproject.org/sites/climatealityproject.org/files/HandbookonCarbonFinancing_Final_May16.pdf)>.

<sup>70</sup> *Securing a clean energy future: The Australian Government's Climate Change Plan* (Report, 2011) 27 <<http://large.stanford.edu/courses/2012/ph240/aslani2/docs/CleanEnergyPlan-20120628-3.pdf>>.

<sup>71</sup> D. Lockie, *Clean Energy Law in Australia* (LexisNexis Australia, 2012) 11.

and subsequently be reviewed by the Climate Change Authority in 2017.<sup>72</sup> During the flexible charge period, the Government was to set an overall cap on pollution and fix a number of carbon permits issued each year.<sup>73</sup>

The Norwegian/EU ETS does not have either a price ceiling or a price floor for trading allowances; the price is determined by the market. In the first two Phases, most allowances were allocated for free. It was mainly in Phase III that the auctioning of allowances began. The auctioning was done through a common auction platform and was governed by the Auctioning Regulation.<sup>74</sup> This led to price volatility leaving a sense of uncertainty for companies to invest. The price volatility had been influenced by the immature market, price driving factors, and supply and demand factors.<sup>75</sup>

### *3.3 Greenhouse Gas Coverage*

In terms of greenhouse gas coverage, the Australian ETS covered carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbon, and perfluorocarbons.<sup>76</sup> This situation is different in the Norwegian ETS (linked to the EU ETS) which started with carbon dioxide in Phase I, nitrous oxide in Phase II and perfluorocarbons in Phase III.<sup>77</sup> There have been no changes made to the coverage of greenhouse gases in Phase IV.

### *3.4 Sector Coverage*

In terms of sector coverage, the Australian ETS covered large emitters emitting more than 25,000 tonnes of CO<sub>2</sub>-e per year from electricity generation, direct combustion, industrial

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<sup>72</sup> *Securing a clean energy future: The Australian Government's Climate Change Plan* (Report, 2011) 27 <<http://large.stanford.edu/courses/2012/ph240/aslani2/docs/CleanEnergyPlan-20120628-3.pdf>>.

<sup>73</sup> *Securing a clean energy future: The Australian Government's Climate Change Plan* (Report, 2011) 26 <<http://large.stanford.edu/courses/2012/ph240/aslani2/docs/CleanEnergyPlan-20120628-3.pdf>>.

<sup>74</sup> *Commission Regulation (EU) No 1031/2010 of 12 November 2010 on the timing, administration and other aspects of auctioning of greenhouse gas emission allowances pursuant to Directive 2003/87/EC of the European Parliament and of the Council establishing a scheme for greenhouse gas emission allowances trading within the Community* [2010] OJ L 302/1. This Regulation was amended by the EU Commission Regulation No.1210/2011.

<sup>75</sup> Regina Betz, 'What is Driving Price Volatility in the EU ETS', *Centre for Energy & Environmental Markets* (Web Page, October/November 2006) 4 <[http://www.ceem.unsw.edu.au/sites/default/files/uploads/publications/PagesfromAETFReviewOctNov06\\_web-2-1.pdf](http://www.ceem.unsw.edu.au/sites/default/files/uploads/publications/PagesfromAETFReviewOctNov06_web-2-1.pdf)>.

<sup>76</sup> *Clean Energy Act 2011* (Cth) s 5 (repealed); *National Greenhouse and Energy Reporting Act 2007* (Cth) s 7A.

<sup>77</sup> European Commission, European Union, *EU ETS Handbook* (2015) 20 <[https://ec.europa.eu/clima/sites/clima/files/docs/ets\\_handbook\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/ets_handbook_en.pdf)>.

processes, and fugitive emissions.<sup>78</sup> The Australian ETS had a broad coverage of the emissions sources including emissions from stationary energy, industrial processes, fugitive emissions, waste, some emissions from business transport, synthetic greenhouse gases, combustion of biofuels and biomass.<sup>79</sup> The agriculture, conventional road transport fuel industries and small businesses were exempted from this scheme.<sup>80</sup>

The Norwegian ETS/EU ETS on the other hand covered power generation installations and energy-intensive manufacturing industries in Phase I. The large emissions intensive industries included oil refineries, coke ovens, iron and steel plants, cement factories, glass, lime, bricks, ceramics, pulp, paper and board.<sup>81</sup> The aviation sector was included in Phase II.<sup>82</sup> Meanwhile in Phase III, further energy intensive industries were included such as aluminium and petrochemical plants.<sup>83</sup> There are no changes made to the scope covered in Phase IV. Those engaged in petroleum activities in Norway faced 'double regulation' (that is, both a carbon tax and an ETS).

### *3.5 Allocation of Allowances*

The Australian ETS fixed the price of carbon for the first three years. During this period, entities were able to purchase permits from the Government at a fixed price. These permits could not be traded or banked for future use. After the fixed period, allowances could be traded. The allowances were allocated for free and by auction.<sup>84</sup>

The Norwegian/EU ETS requires each installation under the scheme to possess emission allowance permits. One emission allowance permit gives the right to emit one tonne

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<sup>78</sup> Greg Combet, *Securing a Clean Energy Future: Implementing the Australian Government's Climate Change Plan* (CanPrint Communications Pty Ltd, 2012) 7 <[https://archive.budget.gov.au/2012-13/ministerial\\_statements/ms\\_climate\\_change.pdf](https://archive.budget.gov.au/2012-13/ministerial_statements/ms_climate_change.pdf)>; *Clean Energy Act 2011* (Cth) s 20 (repealed).

<sup>79</sup> *Securing a clean energy future: The Australian Government's Climate Change Plan* (Report, 2011) 104 <<http://large.stanford.edu/courses/2012/ph240/aslani2/docs/CleanEnergyPlan-20120628-3.pdf>>.

<sup>80</sup> Greg Combet, *Securing a Clean Energy Future: Implementing the Australian Government's Climate Change Plan* (CanPrint Communications Pty Ltd, 2012) 8 <[https://archive.budget.gov.au/2012-13/ministerial\\_statements/ms\\_climate\\_change.pdf](https://archive.budget.gov.au/2012-13/ministerial_statements/ms_climate_change.pdf)>.

<sup>81</sup> European Commission, European Union, *EU ETS Handbook* (2015) 18 <[https://ec.europa.eu/clima/sites/clima/files/docs/ets\\_handbook\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/ets_handbook_en.pdf)>.

<sup>82</sup> *Directive 2008/101/EC of the European Parliament and of The Council of 19 November 2008 amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community* [2009] OJ L 8/3, art 3 ('*Directive 2008/101/EC*').

<sup>83</sup> European Commission, European Union, *EU ETS Handbook* (2015) 18 <[https://ec.europa.eu/clima/sites/clima/files/docs/ets\\_handbook\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/ets_handbook_en.pdf)>.

<sup>84</sup> Environmental Defense Fund, 'Australia - The World's Carbon Markets: A Case Study Guide to Emissions Trading', (Web Page, May 2013) 4 <[https://www.edf.org/sites/default/files/EDF\\_IETA\\_Australia\\_Case\\_Study\\_May\\_2013.pdf](https://www.edf.org/sites/default/files/EDF_IETA_Australia_Case_Study_May_2013.pdf)>.

of CO<sub>2</sub>. The EU gives out the allowances to the Member States by free allocation or via auction. In Phase I, most of the allowances were given out for free, 10% auctioned in Phase II, and ½ of total allowances auctioned in Phase III.<sup>85</sup> In the current phase (Phase III), a majority of the allowances are offered by auction.

### 3.6 Banking

Under the Australian ETS, banking<sup>86</sup> of permits was not permitted for the first three years (2012-2014) when the carbon price was fixed.<sup>87</sup> The permits held during this period will automatically be surrendered at the end of each compliance year.<sup>88</sup> Unlimited banking of permits was to be allowed when the carbon price is determined by the markets, after 2015.<sup>89</sup> There are three types of emission allowance units permitted in Australia: (a) carbon emission units; (b) international emission units; and (c) Australian carbon credit units. In contrast, under the Norwegian/EU ETS, unlimited banking of permits is allowed. Participants under the Norwegian/EU ETS can 'bank' and carry forward their surplus allowances at the end of that year to the next phase.<sup>90</sup>

### 3.7 Borrowing

Borrowing<sup>91</sup> of permits was not permitted under the Australian ETS during the initial three years of its operation where the carbon price was fixed.<sup>92</sup> The same applied to the permits that would be held during this period, which would be automatically surrendered at the

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<sup>85</sup> International Carbon Action Partnership, 'EU Emissions Trading System (EU ETS)', (Web Page, 08 January 2020)

<[https://icapcarbonaction.com/en/?option=com\\_etsmap&task=export&format=pdf&layout=list&systems%5B%5D=43](https://icapcarbonaction.com/en/?option=com_etsmap&task=export&format=pdf&layout=list&systems%5B%5D=43)>.

<sup>86</sup> Banking is defined as 'the possibility for agents to save unused permits for future use'. Source: J. Chevallier, 'Banking and Borrowing in the EU ETS: A Review of Economic Modelling, Current Provisions and Prospects for Future Design' (2012) 26(1) *Journal of Economic Surveys* 157, 157.

<sup>87</sup> *Clean Energy Act 2011* (Cth) s 122(6); Environmental Defense Fund, 'Australia - The World's Carbon Markets: A Case Study Guide to Emissions Trading', (Web Page, May 2013) <[https://www.edf.org/sites/default/files/EDF\\_IETA\\_Australia\\_Case\\_Study\\_May\\_2013.pdf](https://www.edf.org/sites/default/files/EDF_IETA_Australia_Case_Study_May_2013.pdf)>.

<sup>88</sup> *Securing a clean energy future: The Australian Government's Climate Change Plan* (Report, 2011) 103 <<http://large.stanford.edu/courses/2012/ph240/aslani2/docs/CleanEnergyPlan-20120628-3.pdf>>.

<sup>89</sup> *Clean Energy Act 2011* (Cth) s 122(4)(b); *Securing a clean energy future: The Australian Government's Climate Change Plan* (Report, 2011) 104 <<http://large.stanford.edu/courses/2012/ph240/aslani2/docs/CleanEnergyPlan-20120628-3.pdf>>.

<sup>90</sup> European Commission, European Union, *EU ETS Handbook* (2015) 133 <[https://ec.europa.eu/clima/sites/clima/files/docs/ets\\_handbook\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/ets_handbook_en.pdf)>.

<sup>91</sup> Borrowing is defined as 'the possibility to borrow permits from future allocations for use in the current period.' Source: J. Chevallier, 'Banking and Borrowing in the EU ETS: A Review of Economic Modelling, Current Provisions and Prospects for Future Design' (2012) 26(1) *Journal of Economic Surveys* 157, 157.

<sup>92</sup> *Clean Energy Act 2011* (Cth) s 122(6).

end of each compliance year, as for banking.<sup>93</sup> After 2015 when the carbon price was to be determined by the market, limited borrowing of permits was to be allowed under the Australian ETS. A liable entity would be allowed to surrender its permits from the following year to 'discharge up to 5 per cent of their liability' (i.e. allowed borrowing of permits up to 5%).<sup>94</sup>

Under the Norwegian/EU ETS, participants are permitted to borrow allowances from the future allocation year (i.e. the next year).<sup>95</sup> Borrowing of allowances is only allowed within a trading period (phases).<sup>96</sup> Participants in one trading period are not allowed to borrow allowances from another trading period.<sup>97</sup>

### *3.8 Mechanism to Address Surplus of Allowances*

The MSR was a mechanism introduced in the EU ETS.<sup>98</sup> This mechanism did not exist in the Australian ETS. The MSR was introduced and began operation in January 2019 to address the surplus of allowances in the EU ETS.<sup>99</sup> The allowances that are back-loaded as a result of the MSR will not be auctioned; rather, they would be transferred to the reserve.<sup>100</sup> By doing this, the European Commission anticipates that it will reduce the surplus of allowances.

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<sup>93</sup> *Securing a clean energy future: The Australian Government's Climate Change Plan* (Report, 2011) 103 <<http://large.stanford.edu/courses/2012/ph240/aslani2/docs/CleanEnergyPlan-20120628-3.pdf>>.

<sup>94</sup> *Securing a clean energy future: The Australian Government's Climate Change Plan* (Report, 2011) 104 <<http://large.stanford.edu/courses/2012/ph240/aslani2/docs/CleanEnergyPlan-20120628-3.pdf>>; Multi-Party Climate Change Committee, Australian Government, *Multi-Party Climate Change Committee Clean Energy Agreement* 11 <[https://www.pfpi.net/wp-content/uploads/2011/07/mpccc\\_cleanenergy\\_agreement-pdf.pdf](https://www.pfpi.net/wp-content/uploads/2011/07/mpccc_cleanenergy_agreement-pdf.pdf)>; Environmental Defense Fund, 'Australia The World's Carbon Markets: A Case Study Guide to Emissions Trading', (Web Page, May 2013) 6 <[https://www.edf.org/sites/default/files/EDF\\_IETA\\_Australia\\_Case\\_Study\\_May\\_2013.pdf](https://www.edf.org/sites/default/files/EDF_IETA_Australia_Case_Study_May_2013.pdf)>.

<sup>95</sup> European Commission, European Union, *EU ETS Handbook* (2015) 133 <[https://ec.europa.eu/clima/sites/clima/files/docs/ets\\_handbook\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/ets_handbook_en.pdf)>.

<sup>96</sup> European Commission, *EU ETS Handbook* (European Union, 2015) 133 <[https://ec.europa.eu/clima/sites/clima/files/docs/ets\\_handbook\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/ets_handbook_en.pdf)>. The EU ETS has a few trading periods (phases): Phase I (2005-2007); Phase II (2008-2012); Phase III (2013-2020); and Phase IV (2021-2030).

<sup>97</sup> European Commission, *EU ETS Handbook* (European Union, 2015) 133 <[https://ec.europa.eu/clima/sites/clima/files/docs/ets\\_handbook\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/ets_handbook_en.pdf)>.

<sup>98</sup> *Decision (EU) 2015/1814 of the European Parliament and of the Council of 06 October 2015 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading scheme and amending Directive 2003/87/EC* [2015] OJ L 264/1.

<sup>99</sup> European Commission, *Market Stability Reserve* (Web Page) <[https://ec.europa.eu/clima/policies/ets/reform\\_en](https://ec.europa.eu/clima/policies/ets/reform_en)>.

<sup>100</sup> European Commission, *Market Stability Reserve* (Web Page) <[https://ec.europa.eu/clima/policies/ets/reform\\_en](https://ec.europa.eu/clima/policies/ets/reform_en)>.

### 3.9 Linking with Other Systems

The Australian ETS allowed linking to other credible international carbon markets and ETS, from the flexible price period. Australia had plans to link the ETS with the EU ETS in 2015 and no later than 1 July 2018 after it started operation.<sup>101</sup> In order to facilitate such linkage, the Australian Government had to make changes to the Australian ETS. The view to link at that time during Gillard Government showed the level of seriousness on GHGe reductions. However, the CPM (both equivalent 'carbon tax' and ETS components) were repealed by the Abbott Government in 2014. This was mainly due to political instability and opposing views on the CPM.

The EU ETS, on the other hand, provided the opportunity to link with other greenhouse gas trading systems as stated in the Directive.<sup>102</sup> As a result, Norway introduced the Norwegian domestic ETS which had similar features to the EU ETS. This was done intentionally to be compatible with the EU ETS with a view of linking the two systems. As a result, in 2008 the Norwegian domestic ETS was linked with the EU ETS.<sup>103</sup> This move would appear to be beneficial to Norway as it helps the country to modestly reduce its GHGe and maintain a stable level of emissions, despite its active involvement in the fossil fuel industry.

## 4.0 Lessons Learned From the Norwegian Comparisons

The sections below summarises the lessons learnt from the Norwegian comparison on using a carbon tax, ETS, and a carbon budget. Norway has legislated for a carbon budget which Australia has not done. The reasons for having a carbon budget are discussed in section 4.3.

### 4.1 Carbon Tax

As discussed above, the Norwegian carbon tax applied to the oil and gas industry. The Australian equivalent 'carbon tax' on the other hand applied to mobile sources, mainly

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<sup>101</sup> European Commission, *Australia and European Commission agree on pathway towards fully linking emissions trading systems*, (Web Page, 28 August 2012) <[https://ec.europa.eu/clima/news/articles/news\\_2012082801\\_en](https://ec.europa.eu/clima/news/articles/news_2012082801_en)>; 'Australia To Link With EU ETS In 2015', *The Sydney Morning Herald* (online, 28 August 2012) <<https://www.smh.com.au/national/australia-to-link-with-eu-ets-in-2015-20120828-24xw6.html>>.

<sup>102</sup> *Directive 2003/87/EC* art 25.

<sup>103</sup> Thorvald Moe, 'Norwegian Climate Policies 1990-2010: Principles, Policy Instruments and Political Economy Aspects' (CICERO Policy Note 2010 No.3, October 2010) 21 <[https://pub.cicero.oslo.no/cicero-xmlui/bitstream/handle/11250/191854/CICERO\\_Policy\\_Note\\_2010-03.pdf?sequence=1&isAllowed=y](https://pub.cicero.oslo.no/cicero-xmlui/bitstream/handle/11250/191854/CICERO_Policy_Note_2010-03.pdf?sequence=1&isAllowed=y)>.

transport fuels that were not covered by the Australian ETS. This can then be extended by applying a carbon tax to the production of oil and gas like the Norwegian carbon tax ('double regulation' for the oil and gas industry), due to rising GHGe from the Australian oil and gas industry.

Besides that, the Norwegian carbon tax was heavily priced when introduced. Australia can follow the Norwegian experience by setting a high carbon tax. As a consequence, polluters will have to pay for each tonne of CO<sub>2</sub> emitted, making it expensive to pollute and increasing the price of carbon-based energy. This can encourage the switch to alternative sources of energy such as RE. Some sectors can be excluded from the carbon tax like the Norwegian carbon tax as discussed in section 2.4 above. The Norwegian carbon tax also included fines and imprisonment as a penalty for non-compliance. While the Australian equivalent 'carbon tax' only had a civil penalty for non-compliance. As such, having stricter penalties for non-compliance would also ensure strict adherence to the law.

#### *4.2 Emissions Trading Scheme*

An ETS have been implemented in many countries, including the Regional Greenhouse Gas Initiative in the United States of America and the New Zealand ETS. Among the different types of ETS, the EU ETS is a very successful one. The EU ETS has high standards of monitoring, reporting and compliance. Despite its shortcomings in the first two phases, the EU ETS remains an example for other countries.

The Australian discussion on the introduction of an ETS started in the early 1990s. An ETS was a core part of the CPM introduced in Australia in 2011. The ETS was on the verge of being implemented, however the whole CPM (comprising the equivalent 'carbon tax' and ETS components) was repealed in 2014 after the Abbott Liberal-National Coalition Government came to power. Due to the political circumstances of the country, the proposed Australian ETS was not given a chance to show its effectiveness. The Federal Government and the States have a lot of knowledge on pricing carbon, however, to date Australia failed to implement it.

When considering an ETS, attention must be given to certain design features such as those discussed in section 3 above: (1) threshold figure and cap, (2) price ceiling and price floor, (3) banking and borrowing of credits, (4) linking with other emissions trading system, and (5) allocation of allowances. Therefore, I would suggest a combination of the salient

design features from the Norwegian/EU ETS experience to implement a better ETS in Australia, if adopted in the future.

In terms of the threshold, the Norwegian/EU ETS has sector specific thresholds, compared to the previous Australian ETS which had a threshold figure of 25,000 tonnes of CO<sub>2</sub> applicable to all the sectors covered under the scheme. This is something beneficial to be learnt from the Norwegian/EU ETS experience categorising emitters into different categories (small, medium, and large) and having different thresholds for different sectors. By doing so, different categories of emitters will be held accountable for their emissions and stricter reporting procedures would be applicable for emitters in the medium and large categories.<sup>104</sup>

In designing an ETS, an emissions target or cap must be set. The cap should be consistent with Australia's long-term reduction target. This is to ensure that emissions are decreasing over time. The LRF could be adopted from the Norwegian/EU ETS to continuously reduce emissions.

The cap setting concerns not only the initial cap and adjusted cap over time, but also concerns the allocation of allowances. The allowances can be issued for free or bought through an auction from the Government, or a combination of both. Allowances should be allocated cautiously as over-allocation of allowances and oversupply of allowances can affect the allowance price as seen in the EU ETS.

Besides that, another important design feature is price ceiling and price floor. The question that arises is whether it is better to have a price ceiling and price floor or is it better to allow the carbon price units to be determined by the carbon markets. In my view, if the carbon price is to be determined by the market, a price floor and price ceiling should be enforced to reduce price volatility. The Australian ETS (CPM legislation) provided for a price floor and price ceiling to be applicable for the first three years of the flexible charge period between 1 July 2015 and 30 June 2018.<sup>105</sup> A price floor is set to 'prevent the domestic Australian permit price being determined by the lowest-cost recognised emissions units for sale in international markets'.<sup>106</sup> The price floor was also set to prevent price volatility and

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<sup>104</sup> See discussion above in section 3.1.

<sup>105</sup> *Clean Energy Act 2011* (Cth) s 288(1)(f) and 288(1)(g) (repealed).

<sup>106</sup> F. Jotzo, *A price floor for Australia's emissions trading scheme?* (Commissioned paper for Australia's Multi-Party Climate Change Committee, 17 May 2011) 6  
<<https://pdfs.semanticscholar.org/bbdc/e9a46c8dc4ade666cb9d3e93e6ad33773f56.pdf>>.



avoid cheap credits from entering the Australian market.<sup>107</sup> Price ceiling and price floor are essential design features in an ETS.

The Norwegian/EU ETS does not have a price floor or a price ceiling; the carbon price is determined by the markets. This is a significant difference compared to the Australian ETS which was to have a price floor and a price ceiling for the first three years after it came into force; i.e. 2015-2018. Due to the over-allocation of allowances in the EU ETS, the price of allowances became volatile as there was no price floor or price ceiling to prevent this from occurring. However, in January 2019, the MSR was introduced to address the surplus of allowances in the EU ETS.

Another essential design feature is banking and borrowing of credits, which is permitted under the Norwegian/EU ETS. This feature provides price stability. Participants should be allowed to bank and carry forward their surplus allowances. Besides that, participants should also be allowed to borrow allowances within a trading period (phases).

If an Australian ETS had similar features to the EU ETS, it would increase the possibility of linking with other emissions trading systems. This would give a broader spectrum to an Australian ETS allowing the use of international carbon credit units, harmonising the carbon price, and supporting global cooperation on climate change.

It would be practical to implement an ETS as a useful mechanism to reduce GHGe, implement appropriate legislation, and enable linkage with other ETS such as the EU ETS and New Zealand ETS to widen its trading scope. When countries work together to achieve the same goal, it will help to reduce global GHGe. These instruments would make pollution more expensive driving the shift towards other solutions.

As Australia's GHGe are continuously on the rise, implementing a carbon tax and an ETS would be useful mechanisms to control the rising emissions. In doing so, Weishaar has pointed out three questions to consider before the implementation of an ETS: (1) what has been taken into account in designing an ETS; (2) what are the main implementation issues or problems faced in an ETS; and (3) how to address the implementation problems in an 'effective, efficient and acceptable way'.<sup>108</sup>

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<sup>107</sup> Lisa Caripis et al, 'Australia's carbon pricing mechanism' (2011) 2 *Climate Law* 1, 10.

<sup>108</sup> S.E. Weishaar, *Emissions Trading Design: A Critical Overview* (Edward Elgar Publishing, 2014) 6.

The most effective way to address Weishaar's three questions would be to introduce a domestic ETS in Australia using a pilot phase. Once the pilot scheme were functioning effectively, the domestic ETS could be expanded till it is stable and functioning well, and then the option of linking with other ETS (such as the EU ETS) could be explored.

There are implementation issues or problems faced in relation to an ETS. Some of the problems encountered are the allocation of emissions allowances (i.e free allocation and/or over-allocation), and compliance with trading rules in terms of monitoring, reporting and verification.<sup>109</sup> Over-allocation and/or free allocation of allowances can be a problem because they defeat the purpose of the entire trading scheme. To overcome this problem, Australia can adopt the MSR to avoid the surplus of allowances.

#### *4.3 Carbon Budget*

A carbon budget is 'the maximum amount of CO<sub>2</sub> from human sources that can be released into the atmosphere to limit warming to no more than 2°C above pre-industrial levels.'<sup>110</sup> A maximum amount of emissions is assigned to a carbon budget. For a carbon budget to work effectively, it requires frequent monitoring and reporting.

Tomasko notes reasons for having a carbon budget: (1) it pushes the Government to prioritise climate change by implementing a binding carbon budget; (2) creates monitoring and reporting and imposes a penalty if the carbon budget is not followed; and (3) encourages the use of technology to resort to other measures that can reduce emissions.<sup>111</sup> Norway has a carbon budget while Australia does not. Arguably a carbon budget is implied in Australia's PA targets, however, there is no legislated target or a discussion of one by the Morrison Government. It would be practical to introduce a carbon budget in Australia to allow for the development of climate measures on major emitting sectors. This is because a carbon budget sets a maximum amount of emissions that can be emitted, with implications for exceeding the budget.

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<sup>109</sup> S.E. Weishaar, *Emissions Trading Design: A Critical Overview* (Edward Elgar Publishing, 2014) 7, 99-124, 147-162.

<sup>110</sup> Will Steffen, *Unburnable Carbon: Why We Need to Leave Fossil Fuels in the Ground?* (Report, 2015) 12 <<http://www.climatecouncil.org.au/uploads/a904b54ce67740c4b4ee2753134154b0.pdf>>.

<sup>111</sup> M. L. Tomasko, *Norwegian Carbon Budget: An Evaluation of the United Kingdom Climate Change Act's Carbon Budget and Norwegian Climate Policies* (Master's Thesis, Norwegian University of Life Sciences, 2017) 15 <<https://nmbu.brage.unit.no/nmbu-xmlui/bitstream/handle/11250/2450734/Master%27s%20Thesis%202017.pdf?sequence=1&isAllowed=y>>.

The Norwegian *Climate Change Act 2017 (CCA 2017)* incorporates a carbon budget in the legislation. Under *CCA 2017* s 6, the Norwegian Government must provide a status report on Norway's carbon budget to the Parliament every year. Australia does not have a CCA at a federal level but such legislation is in force in Victoria and South Australia.<sup>112</sup> One of the purposes of the *Victorian Climate Change Act 2017* was the establishment of the net zero emissions target by 2050 and a carbon budget process to achieve that target.<sup>113</sup>

An essential feature of a carbon budget is to have an overall target to reduce emissions. Norway's 2030 and 2050 targets have been stipulated in *CCA 2017* ss 3 and 4. In addition, the Norwegian Government must submit updated climate targets to the Parliament every five years.<sup>114</sup> This is done to ensure that the carbon budget is given sufficient attention over the years.

Australia on the other hand promised to set a carbon budget as mentioned in its *Paris Agreement* Nationally Determined Contribution.<sup>115</sup> However, Australia has failed to set such a budget. Conversely, Norway has succeeded in doing so. According to the Climate Council of Australia, Australia's carbon budget is decreasing rapidly; as a result, it has to reduce investment in fossil fuels.<sup>116</sup> As such, it would be beneficial for Australia to have a binding carbon budget at the federal level (i.e implemented through legislation like Norway). When the carbon budget is legislated, it provides binding effect, forcing action on reducing Australia's emissions. If Australia has a Climate Change Act and the Government changes, the Act will still exist or if repealed by a successive Parliament, the change in policy directive would be more transparent.

The introduction of a carbon budget in Australia would also encourage the Australian Government to adopt measures to reduce emissions such as carbon capture and storage (CCS) and increase investment in renewable energy (RE). Further, it would also mandate reporting and monitoring of the climate targets. A carbon budget is simpler and easier to monitor. As global temperature is increasing, the budget must be set stringently. The Climate Council notes that a carbon budget has to be set urgently as it can be a useful approach on

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<sup>112</sup> *Climate Change and Greenhouse Emissions Reduction Act 2007 (SA)*.

<sup>113</sup> *Victorian Climate Change Act 2017* s 6(1).

<sup>114</sup> *Climate Change Act 2017 (Norway)* s 5.

<sup>115</sup> Australia Nationally Determined Contribution is to reduce GHGe by '26 to 28 per cent below 2005 levels by 2030'. Source: Australian Government Department of Industry, Science, Energy and Resources, *Australia's 2030 Climate Change Target (Web Page)* <<https://www.environment.gov.au/climate-change/publications/factsheet-australias-2030-climate-change-target>>.

<sup>116</sup> Will Steffen, *Unburnable Carbon: Why We Need to Leave Fossil Fuels in the Ground?* (Report, 2015) 2 <<http://www.climatecouncil.org.au/uploads/a904b54ce67740c4b4ee2753134154b0.pdf>>.

climate change policy.<sup>117</sup> Therefore, implementing a binding carbon budget for Australia at a federal and State level has the potential of being an effective climate governance tool.

## Conclusion

From the preceding analysis, there are lessons to be learned from the Norwegian comparison on using a carbon tax, ETS, and a carbon budget. A summary of the key comparative lessons from Norway are as follows:

- 1) have a carbon tax for mobile sources extending to the production of oil and gas;
- 2) establish an ETS with the following design features:
  - a cap and adopt the LRF to annually reduce the cap (to ensure emissions do not rise above the cap);
  - sector specific thresholds as opposed to having one threshold figure applying to all the sectors covered under the scheme;
  - a price ceiling and a price floor to reduce price volatility;
  - banking and borrowing of allowances to ensure price stability and possibility of linking with other ETS's;
  - MSR to avoid surplus of allowances;
- 3) a legislated carbon budget to have an overall target and force action on reducing emissions.

The CPM (both equivalent 'carbon tax' and ETS components) were said to have worked well in reducing GHGe.<sup>118</sup> When the CPM was in effect, GHGe in Australia dropped significantly, particularly in 2011 and 2012,<sup>119</sup> showing the effectiveness of the mechanism. However, due to significant political influence from powerful vested interests Australia's fossil fuel industry, the CPM was repealed.<sup>120</sup> This leaves Australia in a position without a carbon price and a cap and trade scheme. These mechanisms are important for replacing the

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<sup>117</sup> Will Steffen, *Unburnable Carbon: Why We Need to Leave Fossil Fuels in the Ground?* (Report, 2015) 32 <<http://www.climatecouncil.org.au/uploads/a904b54ce67740c4b4ee2753134154b0.pdf>>.

<sup>118</sup> Ndevr Environmental, *Tracking 2 Degrees – FY18 Q4* (Web Page) <<http://ndevr.com.au/environmental/tracking-2-degrees-fy18-q4>>.

<sup>119</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2017* (Report, 18 May 2018) 5 <<https://www.environment.gov.au/system/files/resources/7b9824b8-49cc-4c96-b5d6-f03911e9a01d/files/nggi-quarterly-update-dec-2017-revised.pdf>>.

<sup>120</sup> According to the Australian Electoral Commission, oil and gas and mining companies were the major donors to the Liberal party prior to the 2013 election. Source: Australian Electoral Commission, *Summary of Donations Reported by Donors – By Party – 2013-2014* (Web Page) <<https://periodicdisclosures.aec.gov.au/SummaryDonor.aspx>>, archived at <<https://web.archive.org/web/20190524022701/https://periodicdisclosures.aec.gov.au/SummaryParty.aspx>>.

inadequate capacity of the Emissions Reduction Fund (currently the Climate Solutions Package) and the Safeguard Mechanism (SM) to achieve Australia's PA targets. The introduction of a carbon budget in Australia would also be beneficial, as discussed below.

To have a more comprehensive and effective system for reducing GHGe, a hybrid system of an ETS and an equivalent carbon tax, similar to the CPM introduced by the Gillard Government, is a better choice than just an ETS. Leaving aside the political situation, the proposed hybrid ETS and a carbon tax would be an appropriate mechanism for Australia. The Norwegian experience has shown that the merits for having both an ETS and a carbon tax operating in conjunction is reducing GHGe. This is because the ETS allows participants to trade permits giving them flexibility in the system and the carbon tax sets a fixed price on carbon.

The EU ETS is a useful system to follow as it provides a good example on what to follow and what not to, despite being a multi-country scheme. The evolution of this scheme has addressed many implementation issues, proving to be the most effective emissions trading system in the world. The Norwegian/EU ETS proves that placing a price on carbon is possible.

The EU ETS is a flexible, cost-effective and business-friendly approach. Some authors have asserted that ETS's have better performance in terms of their environmental effectiveness and cost effectiveness.<sup>121</sup> This is helping the EU move towards a low carbon and greener future. The EU ETS has reduced EU's GHGe over the years.<sup>122</sup> Norway is at an advantage by being part of the EU ETS.

The Norwegian regime is regarded as largely successful, while the proposed Australian ETS experience failed. Norway's ETS has a reducing cap on GHGe, while Australia does not have a cap as a consequence of the repeal of the CPM. The lack of political support for the Australian CPM also contributed to the failure of the proposed ETS.

If a carbon price and ETS was re-introduced again in Australia, the fossil fuel industry would be the major stakeholders affected. Nonetheless, in my view, the oil and gas companies would still support the idea of a carbon price. This is evident from the statement made by

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<sup>121</sup> Erik Haites et al, 'Experience with Carbon Taxes and Greenhouse Gas Emissions Trading Systems' (2018) Vol. XXIX *Duke Environmental Law & Policy Forum* 109, 110.

<sup>122</sup> L. M. Brown, A Hanafi and A. Petsonk, *The EU Emissions Trading System: Results and Lessons Learned* (Report, 2012) 4  
<[https://www.edf.org/sites/default/files/EU\\_ETS\\_Lessons\\_Learned\\_Report\\_EDF.pdf](https://www.edf.org/sites/default/files/EU_ETS_Lessons_Learned_Report_EDF.pdf)>.

Woodside CEO, Peter Coleman, who has called for a carbon price to be introduced in Australia.<sup>123</sup> His view was supported by BHP and Rio Tinto.<sup>124</sup> Woodside supports the *PA*<sup>125</sup> and low-cost abatement through global carbon pricing<sup>126</sup>.

There are differing views on implementing an ETS or a carbon tax. Prest is of the view that an ETS would be feasible in Australia as opposed to carbon tax, considering the political views on a carbon tax.<sup>127</sup> A carbon price based on a hybrid system of carbon tax and ETS would have a broader operation than just an ETS and be more effective at reducing emissions, as shown in the experience of the CPM. Australia can have both instruments (i.e carbon tax and ETS) as each instrument suits different areas.

In my view, Australia should re-introduce the CPM together with its associated legislation. Consultation with the different players within society (i.e business, industry, consumers) is essential, as is the consensus of all political parties, to ensure certainty and have a mechanism that can last even if there is a change in political power. It is certainly important to have this change for a long-term benefit. In this way, industries emitting would be clear on what to do, businesses will have certainty in investing and stakeholder's interests will be balanced.

Further, it is also important to have clear and detailed legislation. This is because legislation has the ability to create accountability mechanisms. For an instance, enacting a Climate Change Act at the federal level for Australia, setting out the emissions reductions target, net zero target by 2050, and other monitoring and compliance mechanisms, creates accountability. Developing a carbon budget would provide the basis for capping emissions in Australia, an essential step for implementing an ETS.

The Norwegian experience shows Australia should re-introduce the CPM with a carbon tax and an ETS. The implementation of market-based instruments can encourage the switch

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<sup>123</sup> Elysse Morgan, 'Woodside boss Peter Coleman calls for Australia to introduce a carbon price', *ABC News* (Web Page, 14 November 2018) <<https://www.abc.net.au/news/2018-11-14/woodside-ceo-peter-coleman-argues-for-carbon-price/10494026>>.

<sup>124</sup> Elysse Morgan, 'Woodside boss Peter Coleman calls for Australia to introduce a carbon price', *ABC News* (Web Page, 14 November 2018) <<https://www.abc.net.au/news/2018-11-14/woodside-ceo-peter-coleman-argues-for-carbon-price/10494026>>.

<sup>125</sup> Woodside, *Climate Change* (Web Page, accessed on 13 October 2020) <<https://www.woodside.com.au/sustainability/climate-change>>.

<sup>126</sup> Woodside, *Climate Change Policy* (Web Page, accessed on 13 October 2020) <[https://files.woodside/docs/default-source/about-us-documents/corporate-governance/woodside-policies-and-code-of-conduct/climate-change-policy.pdf?sfvrsn=898084f9\\_10](https://files.woodside/docs/default-source/about-us-documents/corporate-governance/woodside-policies-and-code-of-conduct/climate-change-policy.pdf?sfvrsn=898084f9_10)>.

<sup>127</sup> J. Prest, 'Australian Renewable Energy Law: Carbon Lock-in or Clean Energy Transition' (2018) 9(1) *Renewable Energy Law and Policy* 44, 66.

to RE and adopt CCS as measures to reduce GHGe. The next chapter will examine another mechanism which is RE, used to reduce GHGe in Australia and Norway, and analyse the impact of RE on Norway's emissions.

## Chapter 5: Renewable Energy

### Introduction

Norway's progress in the development of renewable energy (RE) compared to Australia provides valuable lessons in the use of RE to reduce greenhouse gas emissions (GHGe). RE sources are constantly replenished<sup>1</sup> and are regarded as clean energy sources with low environmental impact from emissions in comparison with non-renewable sources of energy such as fossil fuels. Despite the apparent global attraction of RE, the two countries have different perspectives and national approaches.

Australia is slowly shifting towards a cleaner and more sustainable economy by making use of its opportunities. However, there is an urgent need to develop policies at a federal level to reduce emissions and address climate change. Australia's electricity is generated mostly by coal-fired power stations and gas-fired power stations (i.e. 76%).<sup>2</sup> The electricity sector is the largest contributor to GHGe.<sup>3</sup> Recently, the electricity industry has been increasing the use of RE and significantly reducing its emissions. In contrast, Norway's GHGe from electricity generation are low, as 95% of its electricity is generated by hydropower (which produces zero emissions), 2.6% from wind power, and 2.4% from thermal power production.<sup>4</sup>

The fundamental difference in each country's use of RE for electricity generation affects the reduction of GHGe in the transportation sector, through the uptake of electric vehicles (EVs). Australia's transport emissions amounted to 19% of Australia's emissions in 2019,<sup>5</sup> but there is not presently a strong incentive to increase EVs to reduce GHGe because most of the grid electricity is generated from fossil fuels. In Norway, 31.9% of its GHGe in 2018

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<sup>1</sup> Australian Renewable Energy Agency, *Renewable Energy* (Web Page, 18 February 2020) <<https://arena.gov.au/renewable-energy-technologies/>>.

<sup>2</sup> Clean Energy Council, *Clean Energy Australia Report 2020* (Report, 2020) 9 <<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2020.pdf>>.

<sup>3</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: March 2019* (Report, 2019) 7 <<https://www.environment.gov.au/system/files/resources/6686d48f-3f9c-448d-a1b7-7e410fe4f376/files/nggi-quarterly-update-mar-2019.pdf>>.

<sup>4</sup> Statistics Norway, *Electricity* (Web Page, 2 December 2019) <<https://www.ssb.no/en/energi-og-industri/statistikker/elektrisitet/aar>>.

<sup>5</sup> Department of the Environment and Energy, Parliament of Australia, *Australia's Emissions Projections 2019* (Report, December 2019) 20 <<https://www.environment.gov.au/system/files/resources/4aa038fc-b9ee-4694-99d0-c5346afb5bfb/files/australias-emissions-projections-2019-report.pdf>>.



was from transportation,<sup>6</sup> providing a strong incentive to increase the use of EVs to reduce total GHGe. Norway is currently trying to increase the usage of electricity, which uses RE, in the industry and transport sectors.<sup>7</sup>

Australia's general industry emissions (besides the electricity and transportation sectors) have been increasing greatly due to liquefied natural gas (LNG) production. Norway, on the other hand, is pushing to use RE in its industries (such as manufacturing) and is diversifying from fossil fuel to renewable sources to reduce its national GHGe.

The chapter discusses the measures being taken by both countries to promote RE in the electricity, transportation and general industry sectors. The chapter will, first, analyse the development of RE sources and legal principles in Australia and Norway. Secondly, it considers the factual differences in the use of renewable sources in both countries in respect of the electricity, transportation and general industry sectors. Thirdly, it discusses the barriers to RE in Australia. Given the complexity of this chapter, summary of chapter sections is provided.

## 1.0 Renewable Energy Sources, Development and Principles

RE<sup>8</sup> is one of the successful mechanisms used to reduce GHGe in Norway. Norway is technically more advanced than Australia in RE due to the vast amounts of hydropower it possesses and its experience in hydropower development. Despite possessing large amounts of RE sources, Australia is still lagging in its RE development. In 2019, 24% of electricity was generated from renewable sources, while 76% was generated from fossil fuels.<sup>9</sup> Australia has large wind and solar energy sources, but the uptake is still low. Norway is more advanced in

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<sup>6</sup> Statistics Norway, *Emissions to Air* (Web Page, 14 January 2020) <<https://www.ssb.no/en/klimagassn>>. Norway's emissions from the transportation sector is calculated based on the figures in the table stated in this website  $16.6/52.0 \times 100\% = 31.92\%$ . Norway's GHGe figures for 2019 are not available yet.

<sup>7</sup> International Energy Agency, 'Energy Policies of EIA Countries: Norway 2017 Review' (Web Page) <<http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>> 125, archived at <<https://web.archive.org/web/20180919222931/http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>>.

<sup>8</sup> Renewable energy is defined as 'energy that is generated from resources that may be naturally replenished, such as solar, wind, rain, tides, waves and geothermal heat.' Source: S. Hepburn, *Mining and Energy Law* (Cambridge University Press, 2015) 241.

<sup>9</sup> Clean Energy Council, *Clean Energy Australia Report 2020* (Report, 2020) 11 <<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2020.pdf>>.

its RE production and usage. This section also discusses the different national approaches towards RE and the national institutions of each country.

### *1.1 Renewable Sources and History of Renewable Energy Development in Australia and Norway*

This section will identify the three RE sources (hydropower, solar and wind power) and recount the history of their development in Australia and Norway. Each country has comparative advantages in different RE sources; Australia has definite advantages in access to solar and wind energy, while Norway has definite advantages in access to hydropower. Australia has good access to onshore wind energy, while Norway has limited onshore wind energy and has to utilise its offshore wind energy due to its mountainous terrain.

About 75% of Australia's electricity generation is dominated by coal-fired power stations to meet domestic energy demands.<sup>10</sup> Yet Australia is rich in natural resources and is at an advantage in RE with an abundance of wind, solar, and hydropower energy. In 2018, Australia's wind energy generation amounted to 16.27 TWh; solar energy generation of 12.08 TWh; and hydropower energy generation of 17.27 TWh.<sup>11</sup> Australia is increasingly developing RE, making use of the clean energy resources available. There is some resistance to investment in RE due to concerns that it will jeopardise the fossil fuel industry and the Australian economy. Despite this, total electricity generation from renewable sources increased in 2019 by about 3% compared to 2018.<sup>12</sup>

In Norway, the largest source of electricity generation is hydropower and, to a certain extent, wind power and solar power. In 2018, Norway's hydropower energy generation amounted to 138.5 TWh; wind energy generation 3.88 TWh; and solar energy generation 0.06 TWh.<sup>13</sup> Due to its high amount of hydropower generation, GHGe from the electricity sector in Norway are low.

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<sup>10</sup> Australian Government Geoscience Australia, *Basics* (Web Page) <<https://www.ga.gov.au/scientific-topics/energy/basics>>.

<sup>11</sup> Hannah Ritchie and Max Roser, 'Renewable Energy', *Our World In Data* (Web Page, 2020) <<https://ourworldindata.org/renewable-energy#citation>>.

<sup>12</sup> Clean Energy Council, *Clean Energy Australia Report 2020* (Report, 2020) 9 <<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2020.pdf>>; Clean Energy Council, *Clean Energy Australia Report 2019* (Report, 2019) 9 <<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2019.pdf>>.

<sup>13</sup> Hannah Ritchie and Max Roser, 'Renewable Energy', *Our World In Data* (Web Page, 2020) <<https://ourworldindata.org/renewable-energy#citation>>.

Hydrogen is another renewable source developing throughout the world, which is briefly introduced here but the detail is beyond the scope of this thesis. The burning of hydrogen is clean and does not create CO<sub>2</sub> emissions, as the by-products of burning are water vapour and heat.<sup>14</sup> Hydrogen can be compressed, liquified or transported through a pipeline. It can be produced from water, coal or natural gas.<sup>15</sup> Hydrogen has high energy to weight density and can be used as a tool to move towards zero emissions. The potential benefits of hydrogen fuel use and exports maybe significant for both Australia and Norway.

Norway's maritime industry is its second largest sector and has high GHGe which shows Norway's practical motivation to reduce GHGe in this sector. Norway has a hydrogen propulsion system for large maritime vessels currently on trial, with plans to start operating in 2021.<sup>16</sup> This project is heavily funded by the Norwegian Government. There are also some hydrogen vehicles sold in Norway, but the uptake remains low. An EU-related hydrogen network has been established, called Hydrogen 2020, to conduct research and development in this area.<sup>17</sup> The use of hydrogen is still in the development phase and will take time to fully come into operation.

The hydrogen industry is also being developed in Australia.<sup>18</sup> The CSIRO<sup>19</sup> introduced a proposal to transport hydrogen as ammonia and reconvert at the point of use (export destination).<sup>20</sup> There are plans to develop hydrogen fuel for shipping,<sup>21</sup> though diesel remains the main source of fuel for ships and, recently, Woodside has been promoting LNG in shipping

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<sup>14</sup> Australian Government, Parliament of Australia, *Hydrogen for Australia's Future: A briefing paper for the COAG Energy Council* (Report, August 2018) 1 <<http://www.coagenergycouncil.gov.au/sites/prod.energycouncil/files/publications/documents/Hydrogen%20for%20Australia%27s%20Future.pdf>>.

<sup>15</sup> Council of Australian Governments Energy Council, Parliament of Australia, *Australia's National Hydrogen Strategy* (Report, 2019) 3 <<https://www.industry.gov.au/sites/default/files/2019-11/australias-national-hydrogen-strategy.pdf>>.

<sup>16</sup> Jamey Bergman, 'High-capacity hydrogen fuel cell project moves towards trial', *Riviera* (Web Page, 7 November 2019 <<https://www.rivieramm.com/news-content-hub/news-content-hub/high-capacity-hydrogen-fuel-cell-project-moves-towards-trials-56740>>.

<sup>17</sup> Norwegian Hydrogen Forum, *The Norwegian Hydrogen Guide* (Report, 2017) 22 <<https://www.hydrogen.no/assets/files/files/hydrogenguide/nhf-hydrogenguiden-2017.pdf>>.

<sup>18</sup> Clean Energy Council, *Clean Energy Australia Report 2019* (Report, 2019) 78-79 <<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2019.pdf>>.

<sup>19</sup> CSIRO refers to the Commonwealth Scientific and Industrial Research Organisation.

<sup>20</sup> Clean Energy Council, *Clean Energy Australia Report 2019* (Report, 2019) 79 <<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2019.pdf>>.

<sup>21</sup> Council of Australian Governments Energy Council, Parliament of Australia, *Australia's National Hydrogen Strategy* (Report, 2019) 39 <<https://www.industry.gov.au/sites/default/files/2019-11/australias-national-hydrogen-strategy.pdf>>.

rather than hydrogen.<sup>22</sup> Hydrogen vehicles are also being trialed in Australia, with hydrogen refueling stations being established.<sup>23</sup> Transdev, the operator of Sydney Harbour's ferries and buses in other parts of Australia, has plans to introduce hydrogen buses in Sydney.<sup>24</sup> These plans are in development, but concerns remain over reliability and safety.

There is potential to develop hydrogen in Australia and Norway, however this will take time. The science on hydrogen is complex and the technology is still developing. Hydrogen falls outside of the scope of this thesis, which focuses on traditional RE sources.

### *1.1.1 Hydropower*

Hydropower is the conversion of moving water into electricity. This process is achieved either through hydroelectricity or pumped hydro energy storage (PHES). Hydroelectricity is generated from a reservoir or dam which converts moving water into electricity when it passes through a turbine (electricity generator).<sup>25</sup> PHES uses water reservoirs to store energy, and when there is excess energy (from the grid or RE source), it can be used to pump the water uphill into storage.<sup>26</sup> Hydropower is a much older and more developed energy technology than solar and wind energy.

Norway has a unique advantage, due to its hydropower resources and many decades of experience developing hydropower. Norway's hydropower history dates from the late 19<sup>th</sup> Century. The first hydropower plant was established in 1891, owned by the municipality of Hammerfest.<sup>27</sup> As of 2019, Norway has 1660 hydropower plants which generate 96% of

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<sup>22</sup> Woodside, *LNG Fuels: The Locally-produced, Lower Emissions Alternative* (Web Page, 8 November 2018) <<https://www.woodside.com.au/news-and-media/stories/story/lng-fuels-the-locally-produced-lower-emissions-alternative>>.

<sup>23</sup> Carsales, *Australia's First Public Hydrogen Refueling Station Confirmed* (Web Page, 9 May 2019) <[https://www.carsales.com.au/editorial/details/australias-first-public-hydrogen-refueling-station-confirmed-118373/?&tracking=dsa&gclid=EAlaIqObChMItYjX3IjT6AIVjDUrCh2YagEuEAAYASAAEgKAEvD\\_BwE&gclid=aw.ds](https://www.carsales.com.au/editorial/details/australias-first-public-hydrogen-refueling-station-confirmed-118373/?&tracking=dsa&gclid=EAlaIqObChMItYjX3IjT6AIVjDUrCh2YagEuEAAYASAAEgKAEvD_BwE&gclid=aw.ds)>; Act Government, *COAG Energy Council Meeting* (Web Page, 22 November 2019) <[https://www.cmtedd.act.gov.au/open\\_government/inform/act\\_government\\_media\\_releases/rattenbury/2019/coag-energy-council-meeting](https://www.cmtedd.act.gov.au/open_government/inform/act_government_media_releases/rattenbury/2019/coag-energy-council-meeting)>.

<sup>24</sup> Ben Potter, 'Transdev Trials Hydrogen Buses', *Financial Review* (Web Page, 22 March 2019) <<https://www.afr.com/politics/transdev-trials-hydrogen-buses-20190321-h1cmfj>>.

<sup>25</sup> Australian Renewable Energy Agency, *Hydropower and Pumped Hydro Energy Storage* (Web Page, 30 January 2020) <<https://arena.gov.au/renewable-energy/pumped-hydro-energy-storage/>>.

<sup>26</sup> Australian Renewable Energy Agency, *Hydropower and Pumped Hydro Energy Storage* (Web Page, 30 January 2020) <<https://arena.gov.au/renewable-energy/pumped-hydro-energy-storage/>>.

<sup>27</sup> Government.no, *The History of Norwegian Hydropower in 5 Minutes* (Web Page, 20 July 2016) <<https://www.regjeringen.no/en/topics/energy/renewable-energy/the-history-of-norwegian-hydropower-in-5-minutes/id2346106/>>.

Norway's electricity.<sup>28</sup> 90% of hydropower electricity is owned by the State, counties, and municipalities.<sup>29</sup> Hydropower forms the 'backbone' of Norway's power system.<sup>30</sup> Norway is rich with lakes and fjords, and over the years many dams have been built to generate electricity. Its hydropower sector is still expanding with increasing hydropower stations and projects.<sup>31</sup> Norway's hydropower industry is well developed and has expanded over the years. Norway is currently Europe's biggest producer of hydropower and the sixth largest producer in the world.<sup>32</sup> In 2016, Norway's hydropower exports reached 16.5 TWh, approximately 10% of its total domestic production.<sup>33</sup>

The legal framework for hydropower in Norway comprises: the *Management Plan for Water Resources*, the *Industrial Concession Act 1917*, the *Watercourse Regulation Act 1917*, the *Water Resources Act 2001*, and the *Energy Act 1990*.<sup>34</sup> All water resources must be managed within this framework as most of the electricity produced is owned by the State. The *Energy Act 1990* regulates the generation, conversion, transmission, trading and distribution of energy in Norway. RE is sold into the electricity market; this will not be addressed as it is beyond the scope of this thesis. RE operates within the framework of reducing emissions, while GHGe from the fossil fuel industry is regulated by a carbon tax and an emissions trading scheme (ETS) which does not impose a cost on RE.

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<sup>28</sup> Energy Facts Norway, *Electricity Production* (Web Page, 4 January 2019)

<<https://energifaktanorge.no/en/norsk-energiforsyning/kraftproduksjon/>>.

<sup>29</sup> Government.no, *The History of Norwegian Hydropower in 5 Minutes* (Web Page, 20 July 2016)

<<https://www.regjeringen.no/en/topics/energy/renewable-energy/the-history-of-norwegian-hydropower-in-5-minutes/id2346106/>>.

<sup>30</sup> International Hydropower Association, *Norway* (Web Page, May 2017)

<<https://www.hydropower.org/country-profiles/norway#:~:text=Hydropower%20regularly%20accounts%20for%20more,144%20TWh%20of%20clean%20power.>>.

<sup>31</sup> International Hydropower Association, *Norway* (Web Page, May 2017)

<<https://www.hydropower.org/country-profiles/norway#:~:text=Hydropower%20regularly%20accounts%20for%20more,144%20TWh%20of%20clean%20power.>>.

<sup>32</sup> Government.no, *The History of Norwegian Hydropower in 5 Minutes* (Web Page, 20 July 2016)

<<https://www.regjeringen.no/en/topics/energy/renewable-energy/the-history-of-norwegian-hydropower-in-5-minutes/id2346106/>>.

<sup>33</sup> International Hydropower Association, *Norway* (Web Page, May 2017)

<<https://www.hydropower.org/country-profiles/norway#:~:text=Hydropower%20regularly%20accounts%20for%20more,144%20TWh%20of%20clean%20power.>>.

<sup>34</sup> Regjeringen, *The Legal Framework for Hydropower Development* (Web Page)

<<https://www.regjeringen.no/globalassets/upload/kilde/oed/bro/2006/0004/ddd/pdfv/287577-kap.04.pdf>>.

The third largest generator of RE in Australia is hydropower (after wind and solar)<sup>35</sup>: In 2018, hydropower accounted for 7.5% of total electricity generated.<sup>36</sup> This dropped to 6.2% in 2019.<sup>37</sup> Australia has more than 120 hydro power stations, mostly in Tasmania, and the largest hydropower scheme is the Snowy Mountains Hydro-Electric Scheme.<sup>38</sup> This Scheme covers New South Wales (NSW) and Victoria, which relies mostly on hydropower for its electricity generation. The Scheme commenced in 1974<sup>39</sup> and is operated by Snowy Hydro, which is owned by the Australian Government.<sup>40</sup> In early 2019, the Federal Government funded and approved the Snowy 2.0 project,<sup>41</sup> which is the largest RE project in Australia.<sup>42</sup> This project will pump and store water,<sup>43</sup> develop RE and create job opportunities.

The legal framework for the Snowy Mountains Hydro-Electric Scheme comprises the *Snowy Mountains Hydro-Electric Power Act 1949* (no longer in force), the *Snowy Hydro Corporatisation Act 1997* (Cth), *Water Act 2007* (Cth), and the *Water (Amendment) Act 2008* (Cth). These laws and policy foster RE to reduce GHGe. All water resources must be managed within this framework as the production of electricity is owned by the Commonwealth Government and States (NSW and Victoria). The Snowy 2.0 project is characterised as a Critical State Significant Infrastructure (CSSI) under the *Environmental Planning and*

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<sup>35</sup> Clean Energy Council, *Clean Energy Australia Report 2020* (Report, 2020) 9 <<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2020.pdf>>.

<sup>36</sup> Clean Energy Council, *Hydro* <<https://www.cleanenergycouncil.org.au/resources/technologies/hydroelectricity>>.

<sup>37</sup> Clean Energy Council, *Clean Energy Australia Report 2020* (Report, 2020) 9 <<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2020.pdf>>.

<sup>38</sup> International Hydropower Association, *Australia* (Web Page, May 2017) <<https://www.hydropower.org/country-profiles/australia>>.

<sup>39</sup> Snowy Hydro, *The History* (Web Page) <<https://www.snowyhydro.com.au/our-energy/hydro/the-history/>>.

<sup>40</sup> Snowy Hydro, *The Snowy Mountains Scheme* (Web Page) <<https://www.snowyhydro.com.au/our-energy/hydro/the-scheme/>>; Snowy Hydro, *Looking Forward – Snowy 2.0* (Web Page) <<https://www.snowyhydro.com.au/our-scheme/snowy20/>>.

<sup>41</sup> Eliza Laschon, 'Snowy 2.0 project given funds and approval for early work phase by Federal Government', *ABC News* (Web Page, 26 February 2019) <<https://www.abc.net.au/news/2019-02-26/snowy-2.0-project-approved-for-early-works-stage/10848412>>.

<sup>42</sup> Arenawire, *Snowy 2.0 gets green light* (Web Page, 28 February 2019) <<https://arena.gov.au/blog/snowy-2-0-gets-greenlight/#:~:text=Snowy%202.0%20has%20been%20given,the%20massive%20pumped%20hydro%20project.&text=Snowy%20Hydro%20will%20finance%20the,cash%20flow%20and%20debt%20financing.>>>.

<sup>43</sup> Snowy Hydro, *Snowy 2.0* (Web Page) <<https://www.snowyhydro.com.au/our-scheme/snowy20/about-snowy-2-0-2/>>.

*Assessment Act 1979* (NSW).<sup>44</sup> The CSSI sets out a robust environmental assessment and approval process for the Snowy 2.0 project.<sup>45</sup>

### 1.1.2 Solar

Solar energy is created by heat and light from the sun. There are two types of solar power: (a) solar photovoltaic/solar PV;<sup>46</sup> and (b) solar thermal.<sup>47 48</sup> Solar PVs are used on residential rooftops (i.e small-scale) and on large-scale solar farms. Australia has more solar PVs, but also has solar thermal for water heating. In contrast, Norway has less solar energy due to its geographic location, contributing to only a small percentage of its electricity generation.

Solar energy electricity generation is higher in Australia compared to Norway. In Australia, solar energy generation amounted to 5.2% of total electricity generation in 2018,<sup>49</sup> and 7.8% in 2019.<sup>50</sup> In Norway, solar energy generation (thermal power production) amounted to only 2.4% of total electricity generation in 2018.<sup>51</sup> There is steady growth in the use of rooftop solar panels in Australia. Small-scale solar produced 5.3% of Australia's total electricity generation in 2019.<sup>52</sup> In comparison, large and medium-scale solar PV generation is relatively new and produced only 2.5% of Australia's total electricity in 2019.<sup>53</sup> Solar thermal is used for

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<sup>44</sup> 'Snowy 2.0 Project Update', *Snowy Hydro* (Web Page, May 2019) 8 <[https://www.snowyhydro.com.au/wp-content/uploads/2019/05/SH1387\\_SQUARE-BOOKLET\\_Snowy-2-Project-Update\\_MAY-2019\\_v6\\_lowres\\_spread.pdf](https://www.snowyhydro.com.au/wp-content/uploads/2019/05/SH1387_SQUARE-BOOKLET_Snowy-2-Project-Update_MAY-2019_v6_lowres_spread.pdf)>.

<sup>45</sup> 'Snowy 2.0 Project Update', *Snowy Hydro* (Web Page, May 2019) 8 <[https://www.snowyhydro.com.au/wp-content/uploads/2019/05/SH1387\\_SQUARE-BOOKLET\\_Snowy-2-Project-Update\\_MAY-2019\\_v6\\_lowres\\_spread.pdf](https://www.snowyhydro.com.au/wp-content/uploads/2019/05/SH1387_SQUARE-BOOKLET_Snowy-2-Project-Update_MAY-2019_v6_lowres_spread.pdf)>.

<sup>46</sup> Solar photovoltaic 'converts sunlight directly into electricity using a technology known as a semiconductor cell or solar PV cell.' Source: Australian Renewable Energy Agency, *Solar* (Web Page, 20 March 2020) <<https://arena.gov.au/renewable-energy/solar/>>.

<sup>47</sup> Solar thermal converts sunlight into heat.

<sup>48</sup> Australian Renewable Energy Agency, *Solar* (Web Page, 20 March 2020) <<https://arena.gov.au/renewable-energy/solar/>>.

<sup>49</sup> Clean Energy Council, *Clean Energy Australia Report 2019* (Report, 2019) 9 <<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2019.pdf>>.

<sup>50</sup> Clean Energy Council, *Clean Energy Australia Report 2020* (Report, 2020) 9 <<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2020.pdf>>.

<sup>51</sup> Statistics Norway, *Electricity* (Web Page, 2 December 2019) <<https://www.ssb.no/en/energi-og-industri/statistikker/elektrisitet/aar>>. Norway's total electricity generation figures for 2019 is not available.

<sup>52</sup> Clean Energy Council, *Clean Energy Australia Report 2020* (Report, 2020) 9 <<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2020.pdf>>.

<sup>53</sup> Clean Energy Council, *Clean Energy Australia Report 2020* (Report, 2020) 9 <<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2020.pdf>>.

space heating and to heat water on a small-scale.<sup>54</sup> On a large-scale, it is used to heat a thermal energy storage system.<sup>55</sup> There is no substantial data to show solar thermal's total electricity generation in Australia. The difference between the two countries is that Australia uses more solar PVs, while Norway mainly uses solar thermal for electricity generation.

Despite solar energy being beneficial in many aspects, there are also some problems associated with solar farms.<sup>56</sup> Problems include occupying a lot of space, expensive energy storage and maintenance, high initial cost, and accessibility to the grids. Although these hurdles exist, Australia is still pursuing investment in solar energy as it is a reliable renewable source. Norway possesses limited resources in solar energy, due to its geographic location, receiving less sunlight in a year.

### 1.1.3 Wind

Wind power is a cheap resource that generates electricity through a wind turbine. There are two different types of wind farms, onshore and offshore. Wind farms also bear high initial set up costs. However, the cost of technology has decreased over the years, encouraging investment. The establishment of a wind farm requires high capital, but it will have lower operating costs.<sup>57</sup>

#### 1.1.3(a) Wind Power Resources

The largest generator of RE in Australia is wind power, comprising 8.5% of total electricity generation in 2019.<sup>58</sup> In addition, nine new projects were commissioned in 2018 and 24 projects are under construction.<sup>59</sup> Sapphire Wind Farm was the largest wind project in

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<sup>54</sup> Australian Renewable Energy Agency, *Solar* (Web Page, 20 March 2020) <<https://arena.gov.au/renewable-energy/solar/>>.

<sup>55</sup> Australian Renewable Energy Agency, *Solar* (Web Page, 20 March 2020) <<https://arena.gov.au/renewable-energy/solar/>>.

<sup>56</sup> Renewable Resources Coalition, *The Disadvantages of Solar Energy* (Web Page, 16 December 2016) <<https://www.renewableresourcescoalition.org/solar-energy-disadvantages/>>; Kashyap Vyas, 'The Pros and Cons of Using Solar Energy', *Interesting Engineering* (Web Page, 6 October 2019) <<https://interestingengineering.com/the-pros-and-cons-of-using-solar-energy>>.

<sup>57</sup> CSIRO, *Annual Update Finds Renewable are Cheapest New-Build Power* (Web Page, 21 December 2018) <<https://www.csiro.au/en/News/News-releases/2018/Annual-update-finds-renewables-are-cheapest-new-build-power>>.

<sup>58</sup> Clean Energy Council, *Clean Energy Australia Report 2020* (Report, 2020) 9 <<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2020.pdf>>.

<sup>59</sup> Clean Energy Council, *Wind* (Web Page) <<https://www.cleanenergycouncil.org.au/resources/technologies/wind>>.



Australia in 2018 comprising 75 wind turbines amounting to 270MW.<sup>60</sup> A recent Government report stated that there was an increase in wind electricity generation of 21.4% for the September 2019 quarter.<sup>61</sup> The southern coast of Australia has the best wind energy resources.

Norway has less wind power compared to Australia, but is making full use of its resources with more advanced technology.<sup>62</sup> Wind energy contributed to 2.6% of Norway's total electricity production in 2018.<sup>63</sup> In order to develop these resources, initiatives were taken by Statkraft, a State-owned company, as early as in 1997 to develop wind power projects.<sup>64</sup> The Smøla Wind Farm is one of the largest wind farms in Norway, comprising 68 wind turbines.<sup>65</sup> The Roan Wind Farm, also known as the Fosen Wind Farm, opened in May 2019 and is the largest wind farm in Norway with 71 wind turbines amounting to 255.6MW.<sup>66</sup>

Norway is investing heavily in the development of offshore wind power. Companies such as Equinor and Statkraft are investing billions into wind and solar projects.<sup>67</sup> Equinor was the first company to develop an offshore floating windfarm named Hywind Tampen;<sup>68</sup> the

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<sup>60</sup> Clean Energy Council, *Wind* (Web Page)

<<https://www.cleanenergycouncil.org.au/resources/technologies/wind/>>; Sapphire Wind Farm, *Project* (Web Page) <<https://www.sapphirewindfarm.com.au/project/>>.

<sup>61</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: June 2019* (Report, 2019) 11 <<https://www.environment.gov.au/system/files/resources/8d47dec2-cd70-4a67-a7ab-85d67f3d53be/files/nggi-quarterly-update-jun-2019.pdf>>.

<sup>62</sup> Equinor, *Hywind Tampen: The World's First Renewable Power for Offshore Oil and Gas* (Web Page) <<https://www.equinor.com/en/what-we-do/hywind-tampen.html>>. The Hywind Tampen offshore projects demonstrates Norway's advanced technology.

<sup>63</sup> Statistics Norway, *Electricity* (Web Page, 2 December 2019) <<https://www.ssb.no/en/energi-og-industri/statistikker/elektrisitet/aar>>. Norway's total electricity generation figures for 2019 is not available.

<sup>64</sup> Statkraft, *Wind Power* (Web Page) <<https://www.statkraft.com/energy-sources/wind-power/>>.

<sup>65</sup> Statkraft, *Smola Wind Farm* (Web Page) <<https://www.statkraft.com/globalassets/1-statkraft-public/04-energy-sources/power-plants/brochures/11231-smola-wind-farm-fact-sheet-uk.pdf>>.

<sup>66</sup> Statkraft, *Norway's Largest Wind Farm Opened* (Web Page, 22 May 2019)

<<https://www.statkraft.com/media/news/2019/opening-roan/#:~:targetText=71%20turbines%20have%20been%20erected,Roan%20at%20Fosen%20in%20Tr%C3%B8ndelag.>>; Statkraft, *Roan Wind Farm* (Web Page) <<https://www.statkraft.com/globalassets/1-statkraft-public/1-about-statkraft/projects/norway/fosen/faktaark-roan-vindpark-uk.pdf>>.

<sup>67</sup> Terje Osmundsen, 'Norway's renewable exports to increase 8-fold by 2030', *Energypost.eu* (Web Page, 9 January 2019) <<https://energypost.eu/norways-renewables-exports-to-increase-8-fold-by-2030/>>. Equinor and Statkraft are state-owned/controlled companies. This makes it easier for them to work together to achieve their national aims. Australia, on the other hand, does not have any influence over its assets. This makes the move more difficult. Further, it is also known that countries that have state-owned assets have been more successful with their supply chains, technology development, jobs, and international growth and exports.

<sup>68</sup> Equinor, *Equinor-the world's leading floating offshore wind developer* (Web Page)

<<https://www.equinor.com/en/what-we-do/hywind-where-the-wind-takes-us.html>>, archived at <<https://web.archive.org/web/20200118002741/https://www.equinor.com/en/what-we-do/hywind-where-the-wind-takes-us.html>>.

world's first RE source to be used for offshore oil and gas.<sup>69</sup> This company has diversified its business by investing in energy rather than oil.<sup>70</sup> Enova (a State enterprise) has supported and provided funding for the Hywind Tampen project.<sup>71</sup>

### *1.1.3(b) Coordination of the Generation and Distribution Networks to Connect the New Renewable Energy Sources to the Electricity Markets*

Norway proposes to open two new areas in the North Sea, Sørilige Nordsjø near Denmark, and Utsira Nord to develop floating offshore wind power.<sup>72</sup> Norway's Statnett is working together with the National Grid North Sea Link Limited to build a subsea interconnector (i.e electricity link) connecting Norway and the United Kingdom (UK), which is to be completed by 2021.<sup>73</sup> This project will allow Norway to sell its wind power to the UK and buy wind power from the UK to conserve its hydropower.<sup>74</sup> The subsea connector will carry RE power under the sea and help the UK to reduce its carbon emissions from its power sector by about 17% by 2030.<sup>75</sup>

Norway is more advanced in its wind energy development than Australia, due to its offshore wind farms which require advanced technology. Norway has made significant investment in the technological development of wind energy (e.g offshore wind project). The Hywind project is able to generate electricity for offshore oil and gas production. Australia is making good progress in onshore wind energy development and does not need to develop

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<sup>69</sup> Equinor, *Hywind Tampen: The World's First Renewable Power for Offshore Oil and Gas* (Web Page) <<https://www.equinor.com/en/what-we-do/hywind-tampen.html>>.

<sup>70</sup> Equinor is still investing in oil and are still pursuing oil and gas reserves in a number of jurisdictions around the world including South Australia in the Great Australian Bight. In late February 2020, Equinor announced its withdrawal from the Great Australian Bight. Source: Australian Petroleum Production & Exploration Association, *Equinor Withdraws from the Great Australian Bight* (Web Page, 25 February 2020) <[https://www.appea.com.au/media\\_release/equinor-withdraws-from-the-great-australian-bight/](https://www.appea.com.au/media_release/equinor-withdraws-from-the-great-australian-bight/)>.

<sup>71</sup> Government.no, *Enova supports Equinor's pilot project for floating offshore wind* (Web Page, 29 August 2019) <<https://www.regjeringen.no/en/aktuelt/enova-stotter-equinors-demonstrasjonsprosjekt-for-flytende-havvind/id2666182/>>. Enova is owned by the Ministry of Climate and Environment.

<sup>72</sup> Government.no, *The Ministry of Petroleum and Energy proposes opening of area for offshore wind* (Web Page, 19 June 2019) <<https://www.regjeringen.no/en/aktuelt/the-ministry-of-petroleum-and-energy-proposes-opening-of-area-for-offshore-wind/id2655113/>>.

<sup>73</sup> North Sea Link, *North Sea Link* (Web Page) <<http://northsealink.com/>>.

<sup>74</sup> Statnett, *North Sea Link* (Web Page) <<https://www.statnett.no/en/our-projects/interconnectors/north-sea-link/>>.

<sup>75</sup> National Grid, *Britain's clean energy system achieves historic milestone in 2019* (Web Page, 21 June 2019) <<https://www.nationalgrid.com/britains-clean-energy-system-achieves-historic-milestone-2019>>.

offshore wind power. For example, wind power generation is a vital part of the Snowy 2.0 project which will integrate RE electricity in the South East of Australia with hydro storage.<sup>76</sup>

Proximity is Norway's fortune as its geography permits it to trade wind energy with UK and Europe. Australia is at a disadvantage in this regard, with domestic distances an issue and international remoteness leading to complex trading and export arrangements in South East Asia. The Asia Renewable Energy Hub set up in Western Australia (WA) has the capacity to generate 15,000 MW of solar and wind generation.<sup>77</sup> The trading and export arrangements are complex and beyond the scope of this thesis.

### *1.2 Key Constitutional Principles and Different National Approaches Towards Renewable Energy*

The two countries have different cultural beliefs towards environmental matters. Norway stipulated in its Constitution as early as 1814 that every person has a right to a 'conducive' environment and the wise use of natural resources to protect this right for future generations.<sup>78</sup> No such rights have been stipulated in the Commonwealth of Australia *Constitution Act 1900*. Australia's national anthem asserts that Australia has golden soil and an abundance of nature's gifts. In the author's observation, Australian's entrenched beliefs about resources make them less conscious about the environment.

The view of the Norwegian Government has been to move toward a low-carbon energy system, and to make a change to the economic structure that may cost more initially but, in the long run, save money.<sup>79</sup> In comparison, the Australian Government is using its best efforts to reduce GHGe and, at the same time, maintaining a strong economy.<sup>80</sup>

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<sup>76</sup> 'Snowy 2.0 Project Update', *Snowy Hydro* (Web Page, May 2019) 5, 17 <[https://www.snowyhydro.com.au/wp-content/uploads/2019/05/SH1387\\_SQUARE-BOOKLET\\_Snowy-2-Project-Update\\_MAY-2019\\_v6\\_lowres\\_spread.pdf](https://www.snowyhydro.com.au/wp-content/uploads/2019/05/SH1387_SQUARE-BOOKLET_Snowy-2-Project-Update_MAY-2019_v6_lowres_spread.pdf)>.

<sup>77</sup> The Asian Renewable Energy Hub, *Low Cost Renewable Energy for Local and Export Markets* (Web Page, 2017) <<https://asianrehub.com/>>.

<sup>78</sup> *The Constitution of the Kingdom of Norway 1814* (Norway) art 110b. This Constitution was laid down on 17 May 1814 and revised in 2014. It was subsequently amended by Resolution of 7 January 2020. Source: Lovdata, *The Constitution of the Kingdom of Norway* (Web Page, 16 January 2020) <<https://lovdata.no/dokument/NLE/lov/1814-05-17>>.

<sup>79</sup> International Energy Agency, 'Energy Policies of EIA Countries: Norway 2017 Review' (Web Page) <<http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>> 11, archived at <<https://web.archive.org/web/20180919222931/http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>>.

<sup>80</sup> Department of the Environment and Energy, Parliament of Australia, *2017 Review of Climate Change Policies* (Report, December 2017) 5 <<https://www.environment.gov.au/system/files/resources/18690271-59ac-43c8-ae1-92d930141f54/files/2017-review-of-climate-change-policies.pdf>>.

The Norwegian Government has shown its willingness to move towards a low-carbon energy system and to invest more in RE. For example, the *Paris Agreement (PA)* Nationally Determined Contributions (NDCs) of the two countries show an interesting difference. Norway intends to reduce its GHGe by at least 40% below 1990 levels by 2030,<sup>81</sup> while Australia promises to reduce GHGe by '26-28 per cent on 2005 levels by 2030'.<sup>82</sup>

The Australian Government focuses on reducing GHGe in the electricity sector by encouraging electricity generation from renewable sources. This is emphasised in the Renewable Energy Target (RET). However, there is no national policy incentive for a RET after 2020 (discussed in section 2.1.1). In July-September 2019, electricity generation from RE increased by 20.3%, mainly due to the increase in wind and solar electricity generation.<sup>83</sup> There was a 2.7% increase in total electricity generation from RE in 2019 compared to 2018.<sup>84</sup>

Conversely, the Norwegian Government is concentrating on using hydropower RE in other sectors besides the electricity sector, as most of Norway's electricity is generated by hydropower. The focus of the two Governments differs because of different circumstances. It is evident that Norway is more advanced in the use of RE because of its hydropower knowledge; the advanced technology in hydropower and offshore wind; and capital that it possesses.<sup>85</sup> Australia also has been developing RE over the years and the Australian Government has been providing more funds to increase RE projects.<sup>86</sup> Both Governments are investing in RE projects; the Norwegian Government increased RE funding to more than NOK1 billion (approximately AUD\$152.46 million) in 2019,<sup>87</sup> while the Australian Renewable

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<sup>81</sup> Climate Action Tracker, *Norway Pledges and Targets* (Web Page)

<<https://climateactiontracker.org/countries/norway/pledges-and-targets/>>.

<sup>82</sup> Australian Government, *Australia's 2030 Climate Change Target* (Web Page, 2015)

<<https://www.environment.gov.au/system/files/resources/c42c11a8-4df7-4d4f-bf92-4f14735c9baa/files/factsheet-australias-2030-climate-change-target.pdf>>.

<sup>83</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: June 2019* (Report, 2019) 11

<<https://www.environment.gov.au/system/files/resources/8d47dec2-cd70-4a67-a7ab-85d67f3d53be/files/nggi-quarterly-update-jun-2019.pdf>>.

<sup>84</sup> Clean Energy Council, *Clean Energy Australia Report 2020* (Report, 2020) 9

<<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2020.pdf>>; Clean Energy Council, *Clean Energy Australia Report 2019* (Report, 2019) 9

<<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2019.pdf>>.

<sup>85</sup> Government.no, *More than a Billion Kroner for Renewable Energy* (Web Page, 8 October 2018)

<[https://www.regjeringen.no/en/aktuelt/renewable\\_energy/id2613723/](https://www.regjeringen.no/en/aktuelt/renewable_energy/id2613723/)>; The Explorer, *Renewable Energy Flows through Norway* (Web Page, 20 January 2020)

<<https://www.theexplorer.no/stories/energy/renewable-energy-flows-through-norway/>>.

<sup>86</sup> Australian Renewable Energy Agency, *Funding* (Web Page, 2020) <<https://arena.gov.au/funding/>>.

<sup>87</sup> Government.no, *More than a Billion Kroner for Renewable Energy* (Web Page, 8 October 2018)

<[https://www.regjeringen.no/en/aktuelt/renewable\\_energy/id2613723/](https://www.regjeringen.no/en/aktuelt/renewable_energy/id2613723/)>.

Energy Agency (ARENA) has total funds of AUD\$194 million as of 31 December 2019.<sup>88</sup> Norway, which has one fifth of Australia's population,<sup>89</sup> is heavily funding RE projects, despite being such a small country.

One of the biggest hurdles in transitioning to RE has been the very high up-front capital costs of introducing the technology.<sup>90</sup> The Australian Government's policy modestly supported RE investment until 2020 but there is a lack of a federal policy on RE beyond 2020. In comparison, the Norwegian Government is willing to spend initially on RE from the revenues generated by the carbon tax,<sup>91</sup> to reduce their GHGe in the long run. The difference in national objectives is evident.

### *1.3 National Institutions on Renewable Energy*

The Clean Energy Council in Australia is an important body for RE. It promotes the uptake of clean energy. Besides the Council, the ARENA also aims to promote affordable and reliable RE. This agency is funded by the Australian Government. The Australian Solar Council represents the solar industry.

In WA, the Western Australian Planning Commission sets out requirements for RE facilities planning and development.<sup>92</sup> The energy generation process in WA, which falls under the Energy Transformation Strategy of the WA Government, connects RE generating capacity to the grid.<sup>93</sup> This Strategy is managed by the Energy Transformation Taskforce established on 20 May 2019.<sup>94</sup> The *Electricity Industry Act 2004* (WA) regulates the energy industry in WA.<sup>95</sup>

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<sup>88</sup> Australian Renewable Energy Agency, *Funding* (Web Page, 2020) <<https://arena.gov.au/funding/>>.

<sup>89</sup> Worldometers, *Australia Population* (Web Page, 15 March 2020) <<https://www.worldometers.info/world-population/australia-population/>>; Worldometers, *Norway Population* (Web Page, 15 March 2020) <<https://www.worldometers.info/world-population/norway-population/>>.

<sup>90</sup> Liam Byrnes et al, 'Australian renewable energy policy: Barriers and challenges' (2013) 60 *Renewable Energy*, 714.

<sup>91</sup> Ministry of Climate and Environment, Parliament of Norway, *Better Growth, Lower Emissions – the Norwegian Government's strategy for green competitiveness* (Report, 2018) 17 <<https://www.regjeringen.no/contentassets/4a98ed15ec264d0e938863448ebf7ba8/t-1562e.pdf>>.

<sup>92</sup> Government of Western Australia, *Position Statement: Renewable Energy Facilities* (Web Page, March 2020) 1 <<https://www.dplh.wa.gov.au/getmedia/8c0b28d3-8de0-4a35-8542-d55faff0d405/PS-Renewable-energy-facilities-position-statement>>.

<sup>93</sup> Government of Western Australia, *Energy Transformation Strategy* (Web Page, 17 February 2020) <<https://www.wa.gov.au/organisation/energy-policy-wa/energy-transformation-strategy>>.

<sup>94</sup> Government of Western Australia, *Energy Transformation Strategy* (Web Page, 17 February 2020) <<https://www.wa.gov.au/organisation/energy-policy-wa/energy-transformation-strategy>>.

<sup>95</sup> This Act was amended by the *Electricity Industry Amendment Bill 2019* and came into operation on 7 April 2020.

The Norwegian Water Resources and Energy Directorate (NVE), which falls under the Ministry of Petroleum and Energy, has the responsibility of managing Norway's energy and water resources.<sup>96</sup> The NVE has power to grant small licenses for hydro, wind power plants and heating facilities. In addition, the Norwegian Government uses Enova SF, owned by the Ministry of Climate and Environment, to reduce GHGe, develop technology relating to climate change and supply of energy, and to strengthen the security of supply of energy in Norway.<sup>97</sup>

Statoil, Norway's national oil company, changed its name to Equinor in May 2018.<sup>98</sup> The name change was done to show that the company has diversified its interest from oil and gas to other renewable sources such as wind and solar to become a 'broad energy major'.<sup>99</sup> Equinor is promising that there will be a transition from the use of oil and gas to other renewable sources in future. Its goal is to be at the forefront of developing these resources.<sup>100</sup>

### *Summary of Section 1*

Norway and Australia have comparative advantages in different RE sources and have been making progress on RE development. Norway is in a better position due to its hydropower history resulting in lower emissions from the electricity sector. While Australia is slowly shifting towards cleaner energy in the electricity sector to reduce emissions with increasing wind and solar power generation.

## **2.0 Use of Renewable Energy in Australia and Norway**

A comparative analysis of the use of RE in the electricity generation, transportation and general industry sectors of each country shows the importance of RE in reducing GHGe. Section 2.1 discusses how much RE is used in each country's total electricity generation. As GHGe from the transportation sector is increasing in both countries, section 2.2 highlights the uptake of EVs and the usage of LNG and hydrogen as alternative fuels in the maritime

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<sup>96</sup> International Energy Agency, 'Energy Policies of EIA Countries: Norway 2017 Review' (Web Page) <<http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>> 129, archived at <<https://web.archive.org/web/20180919222931/http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>>.

<sup>97</sup> Enova, *About Enova* (Web Page, 5 February 2018) <<https://www.enova.no/about-enova/>>.

<sup>98</sup> Equinor, *About our Name Change* (Web Page) <<https://www.equinor.com/en/about-us/about-our-name-change.html>>.

<sup>99</sup> Equinor, *About our Name Change* (Web Page) <<https://www.equinor.com/en/about-us/about-our-name-change.html>>.

<sup>100</sup> Equinor, *About our Name Change* (Web Page) <<https://www.equinor.com/en/about-us/about-our-name-change.html>>.

industry. Section 2.3 highlights the use of market-based instruments which drive RE investment resulting in different arguments made by both countries about RE.

### *2.1 Renewable Energy in the Electricity Generation Industry*

Australia had a federal RET to produce 20% of electricity from RE sources by 2020.<sup>101</sup> This target was met in August 2019 and, presently, there is no new RET. Section 2.1.1 discusses the evolution of a federal RET in Australia. Since there is a lack of policy following 2020, the States have come up with their own RETs, which is discussed in section 2.1.2. In comparison, section 2.1.3 explains that Norway does not have a target to produce a certain percentage of electricity from RE sources, as 96% of its electricity is generated by hydropower. RE is an area where Australian federalism has seen some States and territories (excluding Western Australia) pursue RE objectives largely independent of Commonwealth policy though with the benefit of financial incentives inherent in the RET. This is a key difference from the unitary structure in Norway.

#### *2.1.1 Federal Renewable Energy Target in Australia*

The serious uptake of RE began when the Howard Government introduced the Mandatory Renewable Energy Target (MRET), currently known as the RET.<sup>102</sup> The RET was introduced in 2009.<sup>103</sup> Australia's national law on RE is the *Renewable Energy (Electricity) Act 2000* (Cth) (*REE Act*) (as amended). In order to promote the usage of RE, the Australian Government introduced the RET policy 'to ensure that at least 33,000 Gigawatt-hour (GWh/year) of Australia's electricity comes from renewable sources by 2020',<sup>104</sup> which is on a large scale. On a smaller scale, the Australian Government supports the installation of solar panels and solar hot water systems.<sup>105</sup>

The *REE Act* was amended in 2015. As discussed in Chapter 2, there are two parts to the RET: (a) large-scale renewable energy target; and (b) small-scale renewable energy

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<sup>101</sup> Juli Tomaras, 'Renewable Energy Policy: Retreat, Renewal, and Revitalisation?', *Parliament of Australia* (Web Page) <[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/pubs/BriefingBook45p/RenewableEnergy](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/BriefingBook45p/RenewableEnergy)>.

<sup>102</sup> As discussed in Chapter 2.

<sup>103</sup> Greg Combet, *Securing a Clean Energy Future: Implementing the Australian Government's Climate Change Plan* (CanPrint Communications Pty Ltd, 2012) 26 <[https://archive.budget.gov.au/2012-13/ministerial\\_statements/ms\\_climate\\_change.pdf](https://archive.budget.gov.au/2012-13/ministerial_statements/ms_climate_change.pdf)>.

<sup>104</sup> Clean Energy Council, *Renewable Energy Target* (Web Page) <<https://www.cleanenergycouncil.org.au/policy-advocacy/renewable-energy-target.html>>.

<sup>105</sup> Clean Energy Council, *Renewable Energy Target* (Web Page) <<https://www.cleanenergycouncil.org.au/policy-advocacy/renewable-energy-target.html>>.

scheme. The RET was weakened in July 2015 by the enactment of the *Renewable Energy (Electricity) Amendment Act 2015* (Cth), which amended *Renewable Energy (Electricity) Act 2000* (Cth) s 40 to reduce the annual target of new large-scale renewable electricity generation from 41,000GWh to 33,000GWh. This weakened target is seen as a step backwards in federal climate and energy law. The logic behind the amendment was to create a more achievable target which balanced Australia's electricity generation assets and encouraged RE investments, while maintaining low electricity prices for consumers and reducing emissions from the electricity sector.<sup>106</sup>

Until 2014, Australia's emissions reduction policies encouraged the use of RE.<sup>107</sup> This position changed after the introduction of the Emissions Reduction Fund (ERF)<sup>108</sup> as this fund provided less encouragement to develop RE. The National Energy Guarantee (NEG), was proposed in 2018 to be introduced in 2020.<sup>109</sup> The purpose of this policy was to provide an affordable and reliable energy system to help Australia reduce its emissions from the electricity industry. However, due to the lack of support from the conservative wing of the Liberal party, the NEG was abandoned by the Morrison Government in September 2018.<sup>110</sup>

The RET is towards the end of its term and there is no current federal policy to replace it. The Energy Minister, Mr. Angus Taylor, revealed in September 2018 that the Morrison Government will not replace the RET, and added that the 'renewable energy target is going to wind down from 2020'.<sup>111</sup> Some analysts also believe that Australia does not have a climate policy at a federal level,<sup>112</sup> resulting in rising emissions.

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<sup>106</sup> Commonwealth of Australia, *Parliamentary Debates*, Senate, 15 June 2015, 3342 <[https://parlinfo.aph.gov.au/parlInfo/download/chamber/hansards/5e022683-1a5e-40b4-b346-f960ee6e4330/toc\\_pdf/Senate\\_2015\\_06\\_15\\_3524\\_Official.pdf;fileType=application%2Fpdf#search=%22chamber/hansards/5e022683-1a5e-40b4-b346-f960ee6e4330/0110%22](https://parlinfo.aph.gov.au/parlInfo/download/chamber/hansards/5e022683-1a5e-40b4-b346-f960ee6e4330/toc_pdf/Senate_2015_06_15_3524_Official.pdf;fileType=application%2Fpdf#search=%22chamber/hansards/5e022683-1a5e-40b4-b346-f960ee6e4330/0110%22)>.

<sup>107</sup> D Lockie, *Clean Energy Law in Australia* (LexisNexis Butterworths, Australia, 2012) xix.

<sup>108</sup> The Emissions Reduction Fund was discussed in Chapter 2.

<sup>109</sup> United Nations Association of Australia, *Managing Climate Change In Australia A Global, Long-Term View Discussion Paper* (Discussion Paper, July 2018) 27 <[https://www.unaa.org.au/wp-content/uploads/2018/07/UNAA\\_ClimateChangeDiscussionPaper.pdf](https://www.unaa.org.au/wp-content/uploads/2018/07/UNAA_ClimateChangeDiscussionPaper.pdf)>. The NEG was abandoned in September 2018. Refer to discussion on NEG at Chapter 2 section 3.5.

<sup>110</sup> Guardian staff, 'Scott Morrison Says National Energy Guarantee 'Is Dead'', *The Guardian* (online, 8 September 2018) <<https://www.theguardian.com/australia-news/2018/sep/08/scott-morrison-says-national-energy-guarantee-is-dead>>.

<sup>111</sup> 'Angus Taylor Confirms Government Won't Be Replacing' Renewable Energy Target', *The Sydney Morning Herald* (online, 18 September 2018) <<https://www.smh.com.au/politics/federal/angus-taylor-confirms-government-won-t-be-replacing-renewable-energy-target-20180918-p504j1.html>>.

<sup>112</sup> Graham Readfern, 'Australia Has No Climate Policy: A Quick Response To A Drawn-out Farce', *The Guardian* (online, 21 August 2018) <<https://www.theguardian.com/environment/planet-oz/2018/aug/21/australia-has-no-climate-policy-a-quick-response-to-a-drawn-out-farce>>.



The Australian Government's policies on RE are inadequate for increasing the use of RE. This may be due to the high cost of RE and an unwillingness to invest in it. The impact of the carbon pricing mechanism's (CPM) abolition on RE is explained in section 2.3.1. As the RET has been met, this leaves Australia with a policy vacuum at the federal level. The States and Territories continue to move on RE without support from the Federal Government to 'fill the void'.<sup>113</sup> Australia needs a RE policy after 2020.

Australia should invest more in RE to achieve the PA target. In the last year, South Australia hit the highest production of renewable generation (wind and solar) amounting to 5,359 gigawatt hours (GWh).<sup>114</sup> In 2018, 19% of electricity was generated from RE in the whole of Australia, and South Australia generated 51% from RE.<sup>115</sup> South Australia's achievements evidence opportunities for large-scale use of RE.<sup>116</sup> What prevents large-scale RE adoption are the high costs involved, lack of experience, immature technology, political considerations, lack of acceptance socially, lack of Government support and other reasons discussed below in section 3.0.<sup>117</sup> Australia could do more to enhance its RE development.

The Morrison Government is seen to be backwards in federal climate and energy law. This is because much emphasis is placed on the fossil fuel industry and the economy of the country by his party. The absence of federal law on climate change and market-based instruments in Australia is not encouraging the move towards using RE. There needs to be drive towards RE, despite the many barriers that exist. The barriers faced by Australia in RE are discussed in more detail in section 3.0.

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<sup>113</sup> Climate Council, *State of Play: Renewable Energy Leaders and Losers* (Report, 2019) 6 <[https://www.climatecouncil.org.au/wp-content/uploads/2019/12/CC\\_State-Renewable-Energy-Nov-2019\\_V5.pdf](https://www.climatecouncil.org.au/wp-content/uploads/2019/12/CC_State-Renewable-Energy-Nov-2019_V5.pdf)>.

<sup>114</sup> Australian Energy Market Operator, *South Australian Renewable Energy Report: South Australian Advisory Functions* (Report, 2017) 1 <[https://www.aemo.com.au/-/media/Files/Electricity/NEM/Planning\\_and\\_Forecasting/SA\\_Advisory/2017/South-Australian-Renewable-Energy-Report-2017.pdf](https://www.aemo.com.au/-/media/Files/Electricity/NEM/Planning_and_Forecasting/SA_Advisory/2017/South-Australian-Renewable-Energy-Report-2017.pdf)>.

<sup>115</sup> Department of the Environment and Energy, *Australian Energy Statistics Table O* (Report, 2019) Table O9 <[https://www.energy.gov.au/sites/default/files/2019\\_aes\\_table\\_o\\_march\\_2019.pdf](https://www.energy.gov.au/sites/default/files/2019_aes_table_o_march_2019.pdf)>. This figures was as of March 2019. Australia's electricity generation from RE increased to 21% at the end of 2019. Source: Clean Energy Council, *Clean Energy Australia Report 2019* (Report, 2019) 7 <<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2019.pdf>>.

<sup>116</sup> Liam Byrnes, Colin Brown, John Foster, Liam D. Wagner, 'Australian renewable energy policy: Barriers and challenges' (2013) 60 *Renewable Energy* 711, 719-720.

<sup>117</sup> Mark Diesendorf, *Renewable Electricity Policy for Australia* (Report, November 2018) 13-26 <<https://www.tai.org.au/sites/default/files/Renewable%20Electricity%20Policy%20for%20Australia%20%5BWeb%5D.pdf>>; Liam Byrnes, Colin Brown, John Foster, Liam D. Wagner, 'Australian renewable energy policy: Barriers and challenges' (2013) 60 *Renewable Energy* 711, 714.

### 2.1.2 States Renewable Energy Targets in Australia

Australia can claim success on its RET up to 2020. The real failure, however, is the lack of policy (RET) following 2020. Most of the States and territories have implemented their own RETs and policies to complement or supplement Commonwealth RE policy. The Climate Council sees the States and territories driving RE development in the absence of federal policy.<sup>118</sup> There has been a perception in Australia that State-based targets are more effective than the Federal Government's RET.<sup>119</sup> However, in South Australia, the federal RET was the driving force behind the State's RE development.

#### **(a) Overview**

The table below is a tabulation of the States progress towards RE.

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<sup>118</sup> Climate Council, *Renewables Ready: States Leading The Charge* (Report, 2017) II <<https://www.climatecouncil.org.au/uploads/9a3734e82574546679510bdc99d57847.pdf>>.

<sup>119</sup> McCullough Robertson, *Renewable Energy in Australia: A Guide to Regulation* (Report, 16 June 2017) <[https://www.mccullough.com.au/wp-content/uploads/2017/07/Renewable-energy-in-Australia-Part-2\\_A-guide-to-regulation\\_FINAL.pdf](https://www.mccullough.com.au/wp-content/uploads/2017/07/Renewable-energy-in-Australia-Part-2_A-guide-to-regulation_FINAL.pdf)>.

**Table 3: Comparison of State RET's, 2050 goals, legislation and policies on RE, renewable energy sources, and States progress on RE up to 2019<sup>120</sup>**

State	RET	2050 goal (net zero emissions target by 2050)	Legislation and policies on RE	Renewable energy sources	Progress up to 2019; percentage of electricity generated from renewables
Australian Capital Territory (ACT)	100% renewable electricity by 2020	Net zero by 2045, net zero by 2050	<i>Electricity Feed-in (Large-Scale Renewable Generation) Act 2011 (ACT); Climate Change and Greenhouse Gas Reduction Act 2010 (ACT); Climate Change and Greenhouse Reduction (Renewable Energy Targets) Determination 2016 (ACT).</i>	Wind, solar	On track, 100% renewable electricity generation <sup>121</sup>

<sup>120</sup> Energetics, *Global Carbon Offsets Markets Analysis* (Report, 2017) 25 <[https://www.qld.gov.au/\\_\\_data/assets/pdf\\_file/0029/67925/global-offset-markets-analysis-report.pdf](https://www.qld.gov.au/__data/assets/pdf_file/0029/67925/global-offset-markets-analysis-report.pdf)>; Climate Council, *Powering Progress: States Renewable Energy Race* (Report, 2018) 20 <<https://www.climatecouncil.org.au/wp-content/uploads/2018/10/States-Renewable-Energy-Report.pdf>>; ACT Government, 'Canberra 100% Renewable: Leading Innovation with 100% Renewable Energy by 2020' (Web Page) 2 <[https://www.environment.act.gov.au/\\_\\_data/assets/pdf\\_file/0007/987991/100-Renewal-Energy-Tri-fold-ACCESS.pdf](https://www.environment.act.gov.au/__data/assets/pdf_file/0007/987991/100-Renewal-Energy-Tri-fold-ACCESS.pdf)>; Tasmanian Government, *Advancing our Renewable Energy Capability* (Web Page) <[http://www.dpac.tas.gov.au/divisions/climatechange/tasmanias\\_climate\\_change\\_action\\_plan\\_2017\\_2021/advancing\\_our\\_renewable\\_energy\\_capability](http://www.dpac.tas.gov.au/divisions/climatechange/tasmanias_climate_change_action_plan_2017_2021/advancing_our_renewable_energy_capability)>; Australian Energy Market Operator, *South Australian Generation Forecasts: South Australian Advisory Functions* (Report, December 2017) 4 <[https://www.aemo.com.au/-/media/Files/Electricity/NEM/Planning\\_and\\_Forecasting/SA\\_Advisory/2017/2017-South-Australian-Generation-Forecast.pdf](https://www.aemo.com.au/-/media/Files/Electricity/NEM/Planning_and_Forecasting/SA_Advisory/2017/2017-South-Australian-Generation-Forecast.pdf)>; Department of Energy and Water Supply, 'Powering Queensland Plan', (Web Page) <[https://www.dnrme.qld.gov.au/\\_\\_data/assets/pdf\\_file/0008/1253825/powering-queensland-plan.pdf](https://www.dnrme.qld.gov.au/__data/assets/pdf_file/0008/1253825/powering-queensland-plan.pdf)>; NSW Government, 'NSW Renewable Energy Action Plan', (Report, 2013) ii <[https://energy.nsw.gov.au/sites/default/files/2018-09/nsw-renewable-energy-action-plan\\_2013.pdf](https://energy.nsw.gov.au/sites/default/files/2018-09/nsw-renewable-energy-action-plan_2013.pdf)>; NSW Government, *Solar energy, A growing part of the energy mix* (Web Page) <<https://energy.nsw.gov.au/renewables/renewable-generation/solar-energy>>; Northern Territory Government, *Committed to Renewable Energy* (Web Page) <<https://roadmaptorenewables.nt.gov.au>>; Mark Diesendorf, *Renewable Electricity Policy for Australia* (Report, November 2018) 6 <<http://www.tai.org.au/sites/default/files/Renewable%20Electricity%20Policy%20for%20Australia%200%5BWeb%5D.pdf>>.

<sup>121</sup> Brett Mason, 'The ACT is now running on 100 renewable electricity', *SBS News* (Web Page, 1 January 2020) <<https://www.sbs.com.au/news/the-act-is-now-running-on-100-renewable-electricity>>.

State	RET	2050 goal (net zero emissions target by 2050)	Legislation and policies on RE	Renewable energy sources	Progress up to 2019; percentage of electricity generated from renewables
Tasmania (TAS)	100% renewable electricity by 2022	Net zero by 2050	<i>Climate Change (State Action) Act 2008</i> (TAS)	Hydropower, wind	Almost on track, 95% renewable electricity generation <sup>122</sup>
South Australia (SA)	Abolished the RET after 2014 <sup>123</sup>	Net zero by 2050 <sup>124</sup>	<i>Climate Change and Greenhouse Emissions Reductions Act 2007</i> (SA)	Wind, solar	Half way through, 51% renewable electricity generation <sup>125</sup>
Victoria (VIC)	25% renewable electricity by 2020, 40% renewable electricity by 2025	Net zero by 2050 <sup>126</sup>	<i>Renewable Energy (Jobs and Investment) Act 2017</i> (VIC)	Wind, solar, hydropower	Catching up, 17% renewable electricity generation <sup>127</sup>
Queensland (QLD)	50% renewable electricity by 2030			Wind, solar	Catching up, 9% renewable electricity generation <sup>128</sup>
New South Wales (NSW)	20% renewable electricity by 2020			Wind, hydropower, solar	At the starting phase, 17% renewable electricity generation <sup>129</sup>

<sup>122</sup> Department of the Environment and Energy, *Australian Energy Statistics Table O* (Report, 2019) Table O9 <[https://www.energy.gov.au/sites/default/files/2019\\_aes\\_table\\_o\\_march\\_2019.pdf](https://www.energy.gov.au/sites/default/files/2019_aes_table_o_march_2019.pdf)>.

<sup>123</sup> Climate Council, *Powering Progress: States Renewable Energy Race* (Report, 2018) 25 <<https://www.climatecouncil.org.au/wp-content/uploads/2018/10/States-Renewable-Energy-Report.pdf>>. Based on the *Climate Change and Greenhouse Emissions Reductions Act 2007* (SA) s 5(2), SA had a RET until 31 December 2014.

<sup>124</sup> Climate Council, *Powering Progress: States Renewable Energy Race* (Report, 2018) IV, 9 <<https://www.climatecouncil.org.au/wp-content/uploads/2018/10/States-Renewable-Energy-Report.pdf>>.

<sup>125</sup> Department of the Environment and Energy, *Australian Energy Statistics Table O* (Report, 2019) Table O9 <[https://www.energy.gov.au/sites/default/files/2019\\_aes\\_table\\_o\\_march\\_2019.pdf](https://www.energy.gov.au/sites/default/files/2019_aes_table_o_march_2019.pdf)>.

<sup>126</sup> *Victorian Climate Change Act 2017* s 6(1).

<sup>127</sup> Department of the Environment and Energy, *Australian Energy Statistics Table O* (Report, 2019) Table O9 <[https://www.energy.gov.au/sites/default/files/2019\\_aes\\_table\\_o\\_march\\_2019.pdf](https://www.energy.gov.au/sites/default/files/2019_aes_table_o_march_2019.pdf)>.

<sup>128</sup> Department of the Environment and Energy, *Australian Energy Statistics Table O* (Report, 2019) Table O9 <[https://www.energy.gov.au/sites/default/files/2019\\_aes\\_table\\_o\\_march\\_2019.pdf](https://www.energy.gov.au/sites/default/files/2019_aes_table_o_march_2019.pdf)>.

<sup>129</sup> Department of the Environment and Energy, *Australian Energy Statistics Table O* (Report, 2019) Table O9 <[https://www.energy.gov.au/sites/default/files/2019\\_aes\\_table\\_o\\_march\\_2019.pdf](https://www.energy.gov.au/sites/default/files/2019_aes_table_o_march_2019.pdf)>.

State	RET	2050 goal (net zero emissions target by 2050)	Legislation and policies on RE	Renewable energy sources	Progress up to 2019; percentage of electricity generated from renewables
Northern Territory (NT)	50% renewable electricity by 2030	Draft net zero emissions by 2050 target <sup>130</sup>		Solar, wind	Trying to improve, but still not sufficient to meet the RET, 4% renewable electricity generation <sup>131</sup>
Western Australia (WA)	-	Net zero by 2050 <sup>132</sup>		Solar, wind	Way behind other states, 8% renewable electricity generation <sup>133</sup>

Based on the table above, it is noted that Tasmania, ACT, and SA are leading in RE. While, WA, Queensland, NT and NSW are clearly well behind. The discussion below is to provide a basic overview on each States progress on RE. Emphasis is placed on the discussion relating to WA.

### **(b) Western Australian Government on Renewable Energy**

The WA Government's view is that the emphasis on RE can be improved by investing and supporting new industries and technologies.<sup>134</sup> It has committed to work together with all

<sup>130</sup> Northern Territory Government, *NT Climate Change Response* (Web Page) <<https://haveyoursay.nt.gov.au/climate-change-response>>.

<sup>131</sup> Department of the Environment and Energy, *Australian Energy Statistics Table O* (Report, 2019) Table O9 <[https://www.energy.gov.au/sites/default/files/2019\\_aes\\_table\\_o\\_march\\_2019.pdf](https://www.energy.gov.au/sites/default/files/2019_aes_table_o_march_2019.pdf)>.

<sup>132</sup> Department of Water and Environmental Regulation, Government of Western Australia, *Climate Change in Western Australia Issues Paper – September 2019* (Report, September 2019) iv <[https://consult.dwer.wa.gov.au/climatechange/issues-paper/user\\_uploads/climate-change-in-wa\\_2019.pdf](https://consult.dwer.wa.gov.au/climatechange/issues-paper/user_uploads/climate-change-in-wa_2019.pdf)>.

<sup>133</sup> Department of the Environment and Energy, *Australian Energy Statistics Table O* (Report, 2019) Table O9 <[https://www.energy.gov.au/sites/default/files/2019\\_aes\\_table\\_o\\_march\\_2019.pdf](https://www.energy.gov.au/sites/default/files/2019_aes_table_o_march_2019.pdf)>. WA has been way behind in terms of policy or legislation targets. However, there has been a large uptake of residential solar panels in WA. 7.3% of renewable electricity generation in WA is from wind and solar electricity. Source: Climate Council, *State of Play: Renewable Energy Leaders and Losers* (Report, 2019) 9 <[https://www.climatecouncil.org.au/wp-content/uploads/2019/12/CC\\_State-Renewable-Energy-Nov-2019\\_V5.pdf](https://www.climatecouncil.org.au/wp-content/uploads/2019/12/CC_State-Renewable-Energy-Nov-2019_V5.pdf)>.

<sup>134</sup> Department of Water and Environmental Regulation, Government of Western Australia, *Climate Change in Western Australia Issues Paper – September 2019* (Report, September 2019) iv <[https://consult.dwer.wa.gov.au/climatechange/issues-paper/user\\_uploads/climate-change-in-wa\\_2019.pdf](https://consult.dwer.wa.gov.au/climatechange/issues-paper/user_uploads/climate-change-in-wa_2019.pdf)>.

sectors of the economy to achieve the States net zero emissions by 2050.<sup>135</sup> WA is the only State with rising GHGe due to growth in the LNG industry. In terms of policy or legislated targets, WA is significantly behind the other Australian States.

Besides having large gas reserves, WA also has large untapped wind and solar resources. According to the Climate Institute report, WA has enough clean energy to power approximately 1.5 million homes.<sup>136</sup> Despite the rise of residential solar panels in WA,<sup>137</sup> only 8% of electricity is generated from renewable sources<sup>138</sup>. Therefore, more investment in RE is needed to reduce WA's emissions from the electricity sector.

The WA Government provided benefits to consumers who installed rooftop solar panels: (a) electricity savings generated by purchasing less energy from the retailer; (b) payment rewards if there is excess electricity generated from the household RE system which feeds into the electricity grid; and (c) upfront discount provided on the purchase price of the RE system.<sup>139</sup> The uptake of solar panels in WA has been increasing due to these incentives.

As for large-scale RE projects, the Emu Downs Solar Farm in WA is one of the largest wind-solar farms.<sup>140</sup> The Collgar wind farm is the largest in WA.<sup>141</sup> As of 2019, RE supplied 20.9% of WA's electricity needs amounting to 4,022 GWh<sup>142</sup>. However, the development of RE in WA is still slow compared to the renewable resources it possesses.

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<sup>135</sup> Department of Water and Environmental Regulation, Government of Western Australia, *Climate Change in Western Australia Issues Paper – September 2019* (Report, September 2019) iv <[https://consult.dwer.wa.gov.au/climatechange/issues-paper/user\\_uploads/climate-change-in-wa\\_2019.pdf](https://consult.dwer.wa.gov.au/climatechange/issues-paper/user_uploads/climate-change-in-wa_2019.pdf)>.

<sup>136</sup> The Climate Institute, 'Clean Energy Jobs in Regional Australia' (Web Page) <[http://www.climateinstitute.org.au/verve/\\_resources/cleanenergyjobssnapshot\\_westernaustralia.pdf](http://www.climateinstitute.org.au/verve/_resources/cleanenergyjobssnapshot_westernaustralia.pdf)>.

<sup>137</sup> Daniel Mercer, 'The rise of solar power is jeopardising the WA energy grid, and it's a lesson for all of Australia', *ABC News* (Web Page, 4 December 2019) <<https://www.abc.net.au/news/2019-12-01/rise-of-rooftop-solar-power-jeopardising-wa-energy-grid/11731452>>.

<sup>138</sup> Department of the Environment and Energy, *Australian Energy Statistics Table O* (Report, 2019) Table O9 <[https://www.energy.gov.au/sites/default/files/2019\\_aes\\_table\\_o\\_march\\_2019.pdf](https://www.energy.gov.au/sites/default/files/2019_aes_table_o_march_2019.pdf)>.

<sup>139</sup> WA Government, *Household Renewable Energy Review* (Web Page) <<https://www.wa.gov.au/organisation/energy-policy-wa/household-renewable-energy-overview>>.

<sup>140</sup> Clean Energy Council, *Clean Energy Australia Report 2019* (Report, 2019) 36 <<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2019.pdf>>.

<sup>141</sup> Collgar Wind Farm, *Welcome to Collgar Wind farm* (Web Page) <<https://www.collgarwindfarm.com.au/>>.

<sup>142</sup> Clean Energy Council, *Clean Energy Australia Report 2020* (Report, 2020) 10, 41 <<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2020.pdf>>.

### 2.1.3 Renewable Energy Target in the Electricity Industry in Norway

Norway has advanced its RE development mainly due to its long history of developing hydropower. Over the years, Norway has developed policies to foster RE and is in a unique position on RE. It has vast amounts of clean energy (i.e. electricity available from hydropower) providing industries and citizens the opportunity to use emissions-free electricity.

As of 2018, electricity is generated from hydropower (95%) and, to a certain extent, from wind power (2.6%) and solar power (2.4%).<sup>143</sup> Norway also has a heating system that is mainly sourced from RE.<sup>144</sup> Electricity generation from RE sources to meet domestic energy demands provides Norway with an added advantage. By way of interest, the United States was able to generate approximately 17% of electricity from renewable sources in 2018,<sup>145</sup> while United Kingdom generated 35.8% from RE in the first quarter of 2019.<sup>146</sup>

### 2.2 Development of Renewable Energy in Transportation Sector

This section will discuss the development of RE in the transportation sector of both countries by highlighting the uptake of EVs. It also discusses the use of RE in the maritime industry.

Emissions from the transportation sector in Australia accounted for 99.9 MtCO<sub>2</sub>-e in March 2018,<sup>147</sup> and 16.6 MtCO<sub>2</sub>-e in Norway in 2018.<sup>148</sup> Emissions from the transportation

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<sup>143</sup> Statistics Norway, *Electricity* (Web Page, 2 December 2019) <<https://www.ssb.no/en/energi-og-industri/statistikker/elektrisitet/aar>>. Norway's total electricity generation figures for 2019 are not available yet.

<sup>144</sup> International Energy Agency, 'Energy Policies of EIA Countries: Norway 2017 Review' (Web Page) <<http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>> 125, archived at <<https://web.archive.org/web/20180919222931/http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>>.

<sup>145</sup> Center for Climate and Energy Solutions, *Renewable Energy* (Web Page) <<https://www.c2es.org/content/renewable-energy/>>.

<sup>146</sup> Department for Business, Energy & Industrial Strategy, 'Statistical Press Release: UK Energy Statistics, Q1 2019', (Web Page, 27 June 2019). <[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/812626/Press\\_Notice\\_June\\_19.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/812626/Press_Notice_June_19.pdf)>.

<sup>147</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: March 2019* (Report, 2019) 7 <<https://www.environment.gov.au/system/files/resources/6686d48f-3f9c-448d-a1b7-7e410fe4f376/files/nggi-quarterly-update-mar-2019.pdf>>.

<sup>148</sup> Statistics Norway, *Emissions to Air* (Web Page, 14 January 2020) <<https://www.ssb.no/en/klimagassn>>. Norway's GHGe figures for 2019 are not available yet.

sector account for 18.8% of Australia's total emissions,<sup>149</sup> and 31.9% of Norway's total emissions<sup>150</sup>. Acknowledging that Norway is 24 times smaller in land mass and has one fifth of Australia's population, Norway's emissions from the transportation sector are much lower than Australia's because of the usage of EVs and ferries.

Norway's high uptake of RE creates a great incentive for EVs, as this provides a way to displace GHGe from transportation. The carbon tax revenue in Norway also helps the development of RE. However, the situation is different in Australia as most electricity is generated from coal-fired power stations and not from renewable sources; there is less immediate benefit in developing EVs. The development of RE electricity sources in Australia seems essential to make the transition to EVs and reduce GHGe from transportation.

### 2.2.1 Electric Vehicles

There are four types of EVs: (a) battery EVs (BEV),<sup>151</sup> (b) plug-in hybrid EVs (PHEV),<sup>152</sup> (c) fuel cell EVs,<sup>153</sup> and (d) non-plug-in hybrid EVs (HEV).<sup>154</sup>

There are a few significant advantages of EVs for Australia and Norway:

- a) reduced or zero pollution in the immediately proximate environment – which will be true in each country;

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<sup>149</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: March 2019* (Report, 2019) 7 <<https://www.environment.gov.au/system/files/resources/6686d48f-3f9c-448d-a1b7-7e410fe4f376/files/nggi-quarterly-update-mar-2019.pdf>>.

<sup>150</sup> Statistics Norway, *Emissions to Air* (Web Page, 14 January 2020) <<https://www.ssb.no/en/klimagassn>>. Norway's emissions from the transportation sector is calculated based on the figures in the table stated in this website  $16.6/52.0 \times 100\% = 31.92\%$ . Norway's GHGe figures for 2019 are not available yet.

<sup>151</sup> Battery electric vehicles are fully electric and runs on a battery. It does not have a petrol/gasoline engine. Source: EVgo, *Types of Electric Vehicles* (Web Page) <<https://www.evgo.com/why-evs/types-of-electric-vehicles/#:~:targetText=Types%20of%20Electric%20Vehicles%3A%20BEV,HEVs%2C%20or%20hybrid%20electric%20vehicles.>>.

<sup>152</sup> Plug-in electric vehicles are a mix of fuel and electricity. Source: Australian Renewable Energy Agency, *Electric Vehicles* (Web Page, 19 March 2020) <<https://arena.gov.au/renewable-energy/electric-vehicles/>>.

<sup>153</sup> Fuel cell electric vehicles uses fuel cells which are mainly fueled by hydrogen. Source: Australian Renewable Energy Agency, *Electric Vehicles* (Web Page, 19 March 2020) <<https://arena.gov.au/renewable-energy/electric-vehicles/>>.

<sup>154</sup> Hybrid electric vehicles runs on gas and electricity. Source: EVgo, *Types of Electric Vehicles* (Web Page) <<https://www.evgo.com/why-evs/types-of-electric-vehicles/#:~:targetText=Types%20of%20Electric%20Vehicles%3A%20BEV,HEVs%2C%20or%20hybrid%20electric%20vehicles.>>.



- b) reduced or zero GHGe, which depends on the source of the electricity – because Norway’s electricity is almost 100% renewable, this is an immediate advantage that is not available in Australia;
- c) more affordable because of a lower cost of electric rather than fossil fuel energy – this seems to be true in Australia and Norway but will also depend on the source of the electricity;<sup>155</sup>
- d) more affordable because of a lower maintenance cost – this is likely true in Australia and Norway; and
- e) reduced noise pollution – also will be true in Australia and Norway.<sup>156</sup>

Further, there are a few significant disadvantages of EVs, at least in the initial stage of development:

- a) higher capital cost of the vehicles – which could be true in Australia and Norway until the EV market is more developed and economies of scale reduce the price of EVs;
- b) the limited range of models available – again, this will depend on the development of the EV market; and
- c) the lack of charging infrastructure (e.g. charging stations) – this is a significant initial capital cost in both Australia and Norway.<sup>157</sup>

The main issue is that the reduction in emissions will depend on the source of electricity used to charge the EVs. The crucial difference between Norway and Australia on the uptake of EVs is that most of Norway’s electricity generation is from hydropower. As such, it is easier for Norway to use EVs to reduce GHGe in the transportation sector. Australia, on the other hand, mostly generates electricity from coal-fired power stations. Thus, switching to EVs will be less useful in the transportation sector as it would not reduce GHGe. However, if the

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<sup>155</sup> Electric Vehicle Council, *State of Electric Vehicles: August 2019* (Report, 2019) 28 <<https://electricvehiclecouncil.com.au/wp-content/uploads/2019/09/State-of-EVs-in-Australia-2019.pdf>>.

<sup>156</sup> Keith, ‘Pros and Cons of Electric Cars in Australia’, *Drive Zero* (Web Page, 21 March 2018) <<https://www.drivezero.com.au/cars/policy-adoption-history/pros-cons-electric-cars-australia/>>; Ergon Energy Network, *Benefits of electric vehicles* (Web Page) <<https://www.ergon.com.au/network/smarter-energy/electric-vehicles/benefits-of-electric-vehicles>>, Conserve Energy Future, *What is an electric car?* (Web Page) <<https://www.conserve-energy-future.com/advantages-and-disadvantages-of-electric-cars.php>>.

<sup>157</sup> Keith, ‘Pros and Cons of Electric Cars in Australia’, *Drive Zero* (Web Page, 21 March 2018) <<https://www.drivezero.com.au/cars/policy-adoption-history/pros-cons-electric-cars-australia/>>; Ergon Energy Network, *Benefits of electric vehicles* (Web Page) <<https://www.ergon.com.au/network/smarter-energy/electric-vehicles/benefits-of-electric-vehicles>>, Conserve Energy Future, *What is an electric car?* (Web Page) <<https://www.conserve-energy-future.com/advantages-and-disadvantages-of-electric-cars.php>>.

electricity is sourced from RE, then increasing the uptake can help reduce emissions in Australia's transportation sector.

The potential disadvantages can be overcome by government policies that foster the uptake of EVs. There has been a significant difference between Australia and Norway in the use of regulation and policy for targets, incentives, and financial subsidies for charging infrastructure.

### *(1) Targets*

Norway has a national target to increase the uptake of EVs while Australia does not. The Electric Vehicle Council of Australia notes that the lack of national support and policies resulted in a stagnant uptake of EVs in Australia.<sup>158</sup> This is supported by ARENA, who notes that the uptake of EVs in Australia is low.<sup>159</sup>

The Norwegian Government has implemented various policies to increase the uptake of EVs over the years. Norway is taking the lead in transitioning towards zero emissions in the transportation sector. The Norwegian Parliament's national goal is to have 100% new passenger cars of zero emission vehicles in 2025.<sup>160</sup> Prime Minister Erna Solberg announced on 27 September 2019 at the United Nations General Assembly that Norway currently has about 45% new zero emission passenger cars.<sup>161</sup> This shows the success rate of EV policies in Norway.

### *(2) Incentives*

The difference in uptake of EV in both countries is incentives. There is little incentive to encourage the uptake of EVs in Australia compared to Norway. The ACT provides a 20% discount on registration fees for zero emissions vehicles and permits the use of transit

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<sup>158</sup> Electric Vehicle Council, *State of Electric Vehicles: August 2019* (Report, 2019) 7 <<https://electricvehiclecouncil.com.au/wp-content/uploads/2019/09/State-of-EVs-in-Australia-2019.pdf>>.

<sup>159</sup> Australian Government Australian Renewable Energy Agency, *Electric Vehicles* (Web Page, 19 March 2020) <<https://arena.gov.au/renewable-energy/electric-vehicles/>>.

<sup>160</sup> Norsk elbilforening, *Norwegian EV Policy* (Web Page) <<https://elbil.no/english/norwegian-ev-policy/>>.

<sup>161</sup> Government of Norway, *Norway's Statement at the United Nations General Assembly* (Web Page, 27 September 2019) <<https://www.regjeringen.no/en/aktuelt/norways-statement-at-the-united-nations-general-assembly/id2670474/>>.

lanes.<sup>162</sup> However, in WA, there are no policies in place encouraging the uptake of EVs. This is evident from the Public Transport Authority of WA's recent action of signing a 10-year contract with Volvo for 900 diesel buses.<sup>163</sup> As most of Australia's increase in emissions are from WA, the WA Government has to take action to reduce emissions.<sup>164</sup> One way of doing this is increasing the use of EVs.

Norway offers incentive packages to encourage the transition to EVs. The Norwegian Government promotes the usage of EVs by giving many incentives such as 25% exemption on Value Added Tax (VAT); no purchase or import taxes; road tax exemption; up to 50% discount on toll roads and ferry fares; free access to public parking and reduced parking fees; free access to charging stations; access to bus lanes; and infrastructure development funding.<sup>165</sup>

These incentives given to zero emission vehicles in Norway are to last until the end of 2021, when the Government revise the incentives to adapt to the developing market.<sup>166</sup> Incentives and a carbon tax are driving the move towards the use of EVs in Norway. Revenues generated from the carbon tax can be used to support the long-term effect of EV policy.<sup>167</sup> Fossil fuel cars are highly taxed following the 'polluter pays' principle. The transportation sector in Norway is heavily taxed.

There is an argument in Norway that the incentives for EVs should gradually be reduced as the market is mature. However, environmental organisations and the Norwegian

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<sup>162</sup> Electric Vehicle Council, *State of Electric Vehicles: August 2019* (Report, 2019) 47 <<https://electricvehiclecouncil.com.au/wp-content/uploads/2019/09/State-of-EVs-in-Australia-2019.pdf>>.

<sup>163</sup> Jon Thomson, 'Volvo wins big 900 bus order with WA Government', *Truck & Bus News* (Web Page, 18 March 2019) <<https://www.truckandbus.net.au/volvo-wins-big-900-bus-order-with-wa-government/>>.

<sup>164</sup> Clean State, *Runaway Train: The Impact of WA's LNG Industry on Meeting our Paris Targets and National Efforts to Tackle Climate Change: CCWA & Clean State Report: October 2019* (Report, 2019) 9 <<https://apo.org.au/sites/default/files/resource-files/2019-11/apo-nid266691.pdf>>.

<sup>165</sup> Norsk Elbilforening, *Norwegian EV policy* (Web Page) <<https://elbil.no/english/norwegian-ev-policy/>>; International Energy Agency, 'Energy Policies of IEA Countries: Norway 2017 Review' (Web Page) <<http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>> 11, archived at <<https://web.archive.org/web/20180919222931/http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>>.

<sup>166</sup> Norsk Elbilforening, *Norwegian EV policy* (Web Page) <<https://elbil.no/english/norwegian-ev-policy/>>.

<sup>167</sup> P. Haugneland et al, 'Putting a Price on Carbon to Fund EV Incentives – Norwegian EV Policy Success' (Symposium Paper, EVS30 Symposium, 9-11 October 2017) 6 <<https://elbil.no/wp-content/uploads/2016/08/EVS30-Norwegian-EV-policy-paper.pdf>>.

Electric Vehicle association argue that the incentives should remain for longer.<sup>168</sup> The success rate of EVs in Norway is high because there is wide public and political support for low-emission transportation.

### (3) Charging Infrastructure

According to the Electric Vehicle Council, the uptake of EVs in Australia increased in the first half of 2019. Consumers' concerns are being addressed and there are more models of EVs available for customers and increased charging infrastructure.<sup>169</sup> Consumers are also concerned about the price and range of models available.

Australians are becoming more aware of EVs.<sup>170</sup> Consumers are mainly concerned about Government policies that support the development of charging infrastructure and reducing the cost of purchasing an EV.<sup>171</sup> Norway has shown that it has effective policies to address these concerns.

One reason why the switch to EVs is slow in Australia is the lack of charging infrastructure available due to the size of the country. As of 2019, Australia has less than 800 charging stations across the country,<sup>172</sup> while Norway had more than 10,000 charging stations as of 2018.<sup>173</sup> These figures show a significant difference on the availability of charging infrastructure in both countries. However, the situation is being enhanced over time in Australia to meet the demand.

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<sup>168</sup> K. Steinbacher, M. Goes, K. Jörling, 'Incentives for Electric Vehicles in Norway: Fact Sheet for Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)' (Web Page, 3 September 2018) 14 <<https://www.euki.de/wp-content/uploads/2018/09/fact-sheet-incentives-for-electric-vehicles-no.pdf>>.

<sup>169</sup> Electric Vehicle Council, *State of Electric Vehicles: August 2019* (Report, 2019) 7 <<https://electricvehiclecouncil.com.au/wp-content/uploads/2019/09/State-of-EVs-in-Australia-2019.pdf>>.

<sup>170</sup> Electric Vehicle Council, *State of Electric Vehicles: August 2019* (Report, 2019) 23 <<https://electricvehiclecouncil.com.au/wp-content/uploads/2019/09/State-of-EVs-in-Australia-2019.pdf>>.

<sup>171</sup> Electric Vehicle Council, *State of Electric Vehicles: August 2019* (Report, 2019) 26 <<https://electricvehiclecouncil.com.au/wp-content/uploads/2019/09/State-of-EVs-in-Australia-2019.pdf>>.

<sup>172</sup> Judy Skatsoon, 'Electric Vehicle Charging Network a High National Priority', *Government News* (Web Page, 13 March 2019) <<https://www.governmentnews.com.au/electric-vehicle-charging-network-a-high-national-priority/>>.

<sup>173</sup> Statista, *Number of charging stations for electric cars in Norway from 2011 to 2018, by type* (Web Page, January 2019) <<https://www.statista.com/statistics/696548/number-of-electric-car-charging-stations-in-norway-by-type/>>.

There have been questions raised as to whether Norway's charging stations are sufficient. Enova, an organisation owned by the Ministry of Climate Change and Environment,<sup>174</sup> supports charging infrastructure in Norway.<sup>175</sup> As the uptake of EVs is growing, the Norwegian Government has taken steps to improve charging infrastructure. The Norwegian Government has established a program to finance the developing of charging stations every 50km along the main roads.<sup>176</sup> These projects receive funding and are supported by Enova.<sup>177</sup> In a world first, there are also plans to install wireless electric car charging stations, targeting the taxis in Oslo, Norway to move towards zero emissions from cabs by 2023.<sup>178</sup>

In Australia, besides action by the Federal Government, the States have undertaken significant initiatives. NSW is trying to introduce electric public transport. In July 2019, Transit Systems started the electric bus trial in Sydney aiming to reduce emissions.<sup>179</sup> The NSW Transport Minister Andrew Constance is considering replacing the bus fleets with fully electrical ones in the near future.<sup>180</sup>

The EV logic in Norway is much stronger as most electricity is generated from hydropower. Australia's RE electricity generation should increase to provide a better result from using EVs. EV use should be promoted alongside increased RE. Once this takes place, Australia should consider Norway's EV policy and incentives provided to increase the uptake of vehicles in the country.

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<sup>174</sup> Enova, *About Enova* (Web Page, 5 February 2018) <<https://www.enova.no/about-enova/>>.

<sup>175</sup> Energy Facts Norway, *Enova* (Web Page, 4 January 2019) <<https://energifaktanorge.no/en/et-baerekraftig-og-sikkert-energisystem/enova/>>.

<sup>176</sup> Fleetcarma, *How Norway became the leading EV market* (Web Page, 21 February 2018) <<https://www.fleetcarma.com/norway-became-leading-ev-market/>>.

<sup>177</sup> Energy Facts Norway, *Enova* (Web Page, 4 January 2019) <<https://energifaktanorge.no/en/et-baerekraftig-og-sikkert-energisystem/enova/>>.

<sup>178</sup> Nick Statt, 'Norway will Install the World's First Wireless Electric Car Charging Stations for Oslo Taxis' (Web Page, 21 March 2019) <<https://www.theverge.com/2019/3/21/18276541/norway-oslo-wireless-charging-electric-taxis-car-zero-emissions-induction>>.

<sup>179</sup> Transit Systems, *Electric Vehicles* (Web Page) <<https://www.transitsystems.com.au/electric-buses/>>; NSW Government Transport for NSW, *Transit System West Case Study* (Web Page) <<https://www.transport.nsw.gov.au/data-and-research/nsw-future-mobility-prospectus/nsw-future-mobility-case-studies/procurement-as-1>>.

<sup>180</sup> Matt O'Sullivan, 'There Is A Real Health Impact': Minister Plans To Electrify Sydney's 8000-strong Bus Fleet', *The Sydney Morning Herald* (online, 28 October 2019) <<https://www.smh.com.au/national/nsw/there-is-a-real-health-impact-minister-in-push-to-electrify-sydney-s-8000-strong-bus-fleet-20191028-p534ts.html>>.

### 2.2.2 Maritime Industry

The maritime industry also contributes a significant proportion of global GHGe.<sup>181</sup> As a result, in April 2018, the International Maritime Organisation's Marine Environment Protection Committee adopted a strategy to reduce total GHGe from international shipping by 'at least 50% by 2050 compared to 2008'.<sup>182</sup> The Norwegian Government has been taking a series of measures to reduce GHGe from the shipping industry by replacing its fleet with hydrogen and battery-electric powered vessels.<sup>183</sup> In comparison, Australia does not have a large shipping industry but still has to comply with the International Maritime Organisation (IMO)'s standards.<sup>184</sup> Therefore, Australian ports need to provide facilities for lower emission fuels.

The Norwegian maritime industry is the second largest export industry after the oil and gas industry.<sup>185</sup> There is a wide range of vessels in the Norwegian fleet and significant emissions from this sector. This leads to Norway's motivation to reduce GHGe from the transportation sector. To reduce emissions in this sector, the Norwegian Government reduced the electricity tax for commercial shipping.<sup>186</sup> There are two main factors that differ between Norway and Australia in the maritime industry, the availability of extensive funding in Norway and the use of hydrogen. Norway has been receiving extensive funding provided by Enova<sup>187</sup> to improvise different types of vessels.<sup>188</sup> The use of electric ferries has increased with the aid of funding from Enova.

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<sup>181</sup> There is no data on these figures or definite percentage to show the global emissions from the maritime industry for 2019. Most figures reported the percentage of emissions from the transportation sector which includes emissions from the maritime industry.

<sup>182</sup> International Maritime Organisation, *Low Carbon Shipping and Air Pollution Control* (Web Page) <<http://www.imo.org/en/MediaCentre/HotTopics/GHG/Pages/default.aspx>>.

<sup>183</sup> Norwegian Ministry of Climate and Environment, Parliament of Norway, *The Government's Action Plan for Green Shipping* (Report, October 2019) 9, 19, 20-21 <<https://www.regjeringen.no/contentassets/2ccd2f4e14d44bc88c93ac4effe78b2f/the-governments-action-plan-for-green-shipping.pdf>>.

<sup>184</sup> Jon Daly, 'Australia's shipping industry to halve toxic emissions by 2050 with dramatic drop of sulphur in fuel', *ABC News* (Web Page, 2 May 2018) <<https://www.abc.net.au/news/rural/2018-05-02/australia-shipping-industry-halving-toxic-fuel-emissions/9716812>>.

<sup>185</sup> Norwegian Ministry of Climate and Environment, *The Government's Action Plan for Green Shipping* (Norwegian Ministry of Climate and Environment, 2019) 14.

<sup>186</sup> Norwegian Ministry of Climate and Environment, *The Government's Action Plan for Green Shipping* (Norwegian Ministry of Climate and Environment, 2019) 61.

<sup>187</sup> Enova is a company owned by the Ministry of Climate and Environment aiming to reduce GHGe by developing RE. Source: Enova, *About Enova* (Web Page, 5 December 2018) <<https://www.enova.no/about-enova/>>.

<sup>188</sup> Norwegian Ministry of Climate and Environment, Parliament of Norway, *The Government's Action Plan for Green Shipping* (Report, October 2019) 7 <<https://www.regjeringen.no/contentassets/2ccd2f4e14d44bc88c93ac4effe78b2f/the-governments-action-plan-for-green-shipping.pdf>>.

Another factor that differs between the two countries is the developing use of hydrogen in Norway's maritime industry. This is evident in a new project for a hydrogen-powered car ferry due to begin operating in 2021.<sup>189</sup> The Norwegian Government is preparing for emission-free shipping. The Norwegian Government also believes that hydrogen will replace fossil fuels in the shipping industry in the long run. In order to achieve this goal, funding has been provided by Enova for research and development. Besides hydrogen, Norway is replacing ferries with electric-battery operation and expects about 80 ferries to run on batteries either partly or fully by 2022.<sup>190</sup>

In October 2019, the Norwegian King stated that the Norwegian Government will follow up continuously on the plan to move towards green shipping.<sup>191</sup> This will advance towards Norway's PA targets and contribute to Norway being a low-emission society by 2050. The Norwegian Maritime Authority is responsible for approving and certifying ships that use environment friendly technologies.<sup>192</sup> As mentioned above, Norway is promoting hydrogen fuel in shipping.<sup>193</sup> As such, Norway appears to be more advanced than Australia in using RE in the maritime industry.<sup>194</sup>

GHGe in Australia from the shipping industry is increasing over the years due to the use of fuel oil and marine diesel oil for transportation of oil and gas.<sup>195</sup> However, from 1 January 2020, ships must comply with the low sulphur limits for fuel in line with the IMO's guidelines.<sup>196</sup> As Australia's export of LNG is increasing, there are more emissions from the

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<sup>189</sup> Norwegian Ministry of Climate and Environment, *The Government's Action Plan for Green Shipping* (Norwegian Ministry of Climate and Environment, 2019) 9.

<sup>190</sup> Norwegian Ministry of Climate and Environment, *The Government's Action Plan for Green Shipping* (Norwegian Ministry of Climate and Environment, 2019) 19.

<sup>191</sup> Government.no, *The Speech from the Throne by His Majesty The King on the Occasion of the Opening of the 164<sup>th</sup> Session of the Storting* (Web Page, 2 October 2019) <<https://www.regjeringen.no/en/aktuelt/the-speech-from-the-throne-by-his-majesty-the-king-on-the-occasion-of-the-opening-of-the-164th-session-of-the-storting/id2670835/>>.

<sup>192</sup> Norwegian Ministry of Climate and Environment, *The Government's Action Plan for Green Shipping* (Norwegian Ministry of Climate and Environment, 2019) 16; Norwegian Maritime Authority, *About Us* <<https://www.sdir.no/en/about-us/>>.

<sup>193</sup> Norwegian Ministry of Climate and Environment, Parliament of Norway, *The Government's Action Plan for Green Shipping* (Report, October 2019) 9, 20-21 <<https://www.regjeringen.no/contentassets/2ccd2f4e14d44bc88c93ac4effe78b2f/the-governments-action-plan-for-green-shipping.pdf>>.

<sup>194</sup> Norwegian Ministry of Climate and Environment, Parliament of Norway, *The Government's Action Plan for Green Shipping* (Report, October 2019) 9 <<https://www.regjeringen.no/contentassets/2ccd2f4e14d44bc88c93ac4effe78b2f/the-governments-action-plan-for-green-shipping.pdf>>.

<sup>195</sup> Australian Maritime Safety Authority, *Compliance with Low Sulphur 2020* <<https://www.amsa.gov.au/marine-environment/air-pollution/compliance-low-sulphur-2020>>.

<sup>196</sup> Australian Maritime Safety Authority, *Compliance with Low Sulphur 2020* <<https://www.amsa.gov.au/marine-environment/air-pollution/compliance-low-sulphur-2020>>.

maritime industry. The Australian Government has been slow in addressing GHGe from the maritime sector but there are plans to use hydrogen in shipping.<sup>197</sup> However, the hydrogen industry is still in a development phase and will take time to eventuate. Fossil fuel is cheap and remains a preferred option. It is only when fossil fuels are made more expensive that alternative energy or fuel sources would be considered. This can be done by placing a price on carbon. Further, Woodside argues that the use of LNG for ships can also reduce emissions.<sup>198</sup> It owns a few vessels powered by LNG.<sup>199</sup>

### *2.3 General Industry Emissions*

A comparative analysis of the use of RE in the general industry in Australia and Norway shows the importance of market-based instruments to drive RE investment. Section 2.3.1 examines how Australia's abolition of the CPM in 2014 led to a drop in RE investment and an increase in general industry emissions. Norway, on the other hand, has been using market-based instruments for decades to speed up the green shift in the Norwegian economy.

There has been recent argument in Australia about displacing coal with gas for electricity generation. This is examined in section 2.3.2. While Norway has minimal coal, its aim is to diversify from fossil fuel because it is already using RE and has market-based instruments driving investment in RE, which is discussed in section 2.3.3.

As Norway is part of the European Economic Area, it is obliged to follow the EU's Renewable Energy Directive in 2011 for promoting the use of energy from RE sources. Norway's has a national target to use 67.5% of RE economy wide (total energy use) by 2020 following Renewable Energy *Directive 2009/28/EC*.<sup>200</sup> Norway acknowledges the EU's RE

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<sup>197</sup> Council of Australian Governments Energy Council, Parliament of Australia, *Australia's National Hydrogen Strategy* (Report, 2019) 39 <<https://www.industry.gov.au/sites/default/files/2019-11/australias-national-hydrogen-strategy.pdf>>.

<sup>198</sup> Woodside, *LNG Fuels: The Locally-produced, Lower Emissions Alternative* (Web Page, 8 November 2018) <<https://www.woodside.com.au/news-and-media/stories/story/lng-fuels-the-locally-produced-lower-emissions-alternative>>.

<sup>199</sup> Woodside, *Marketing, Trading, & Shipping* (Web Page) <<https://www.woodside.com.au/our-business/marketing-trading-shiping>>.

<sup>200</sup> Ministry of Petroleum and Energy, Parliament of Norway, *National Renewable Energy Action Plan under Directive 2009/28/EC: Norway* (Report, September 2012) 13 <[https://ec.europa.eu/energy/sites/ener/files/documents/dir\\_2009\\_0028\\_action\\_plan\\_norway\\_\\_nea\\_p.pdf](https://ec.europa.eu/energy/sites/ener/files/documents/dir_2009_0028_action_plan_norway__nea_p.pdf)>; *Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC* [2009] OJ L 140/16.



2030 target of at least 27% of RE in 2030 and is working on establishing its target for 2030.<sup>201</sup> Norway leads in RE electricity generation. Also, Norway has high uptake of EVs, reducing emissions in the transportation sector. As such, Norway is pushing for RE in other sectors such as manufacturing and energy industries to reduce its national GHGe.

### *2.3.1 Impact of Abolition of the Carbon Pricing Mechanism on Renewable Energy in Australia*

RE became more popular after the CPM was introduced by the Gillard Government in 2011, as producers were finding alternative energy sources to lower emissions. The Gillard Government's Clean Energy Future Plan in 2011, appeared to be a good plan. This plan included 'introducing a carbon price; promoting innovation and investment in renewable energy; encouraging energy efficiency; and creating opportunities in the land sector to cut pollution'.<sup>202</sup> To implement the plan, the Australian Parliament passed the clean energy package of legislation, which included the *Clean Energy Act 2011* (Cth) (repealed), *Clean Energy Regulator Act 2011* (Cth) (repealed) and the *Climate Change Authority Act 2011* (Cth) (repealed).<sup>203</sup> This legislation fostered investment in RE. However, when the CPM was repealed, only the RET, ARENA, Clean Energy Finance Corporation (CEFC) and Climate Change Authority (CCA) were retained.<sup>204</sup>

Australia's investment in RE fell significantly after abolition of the CPM in 2014.<sup>205</sup> RE investment declined about 70% compared to the previous year.<sup>206</sup> This was predicted by Reputex.<sup>207</sup> As there was no cap and trade system to control GHGe, the need to switch to RE declined, and there was continued growth in the fossil fuel industry. Also, there was less

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<sup>201</sup> Regjeringen.no, 'Norwegian position on the proposed EU framework for climate and energy policies towards 2030', (Web Page) <<https://www.regjeringen.no/globalassets/upload/ud/vedlegg/protokoll/141006-posisjonspapir-eu-klima-energi.pdf>>.

<sup>202</sup> Greg Combet, *Securing a Clean Energy Future: Implementing the Australian Government's Climate Change Plan* (CanPrint Communications Pty Ltd, 2012) 5 <[https://archive.budget.gov.au/2012-13/ministerial\\_statements/ms\\_climate\\_change.pdf](https://archive.budget.gov.au/2012-13/ministerial_statements/ms_climate_change.pdf)>.

<sup>203</sup> Greg Combet, *Securing a Clean Energy Future: Implementing the Australian Government's Climate Change Plan* (CanPrint Communications Pty Ltd, 2012) 5-6 <[https://archive.budget.gov.au/2012-13/ministerial\\_statements/ms\\_climate\\_change.pdf](https://archive.budget.gov.au/2012-13/ministerial_statements/ms_climate_change.pdf)>.

<sup>204</sup> Kate Crowley, 'Up and down with climate politics 2013-2016: the repeal of carbon pricing in Australia' (2017) 8 *WIREs Climate Change* 1, 4.

<sup>205</sup> Ken Chan, 'Don't forget the weather in the axing of the carbon tax in Australia' (2015) 6(1-2) *Carbon Management* 63, 66.

<sup>206</sup> T. Flannery, 'Lagging Behind: Australia and The Global Response To Climate Change', *Climate Council* (Report, 2014) iii <<https://www.climatecouncil.org.au/uploads/211ea746451b3038edfb70b49aee9b6f.pdf>>.

<sup>207</sup> Reputex Carbon Analytics, 'Policy Brief: Renewable Energy and the Carbon Price' (Web Page, August 2013) 10 <<http://www.wwf.org.au/ArticleDocuments/360/pub-policy-brief-renewable-energy-and-the-carbon-price-13aug13.pdf.aspx>>.

funding for the ARENA.<sup>208</sup> The decline in RE was due to the Commonwealth Government policy uncertainty after the repeal of the CPM in 2014.<sup>209</sup> However, the RET led to a significant increase in RE electricity in the past four years.

Why did the national government reduce policy support for the RE industry? It was evidently due to the support of the Abbott Government for the fossil fuel industry, and 'forcing an increase in the market share of renewable energy threatens Australia's reliance on coal'.<sup>210</sup> In 2014, Prime Minister Abbott said coal is 'an essential part of our future'.<sup>211</sup> Australia's economy has been reliant on coal, and also oil and gas. Australia earns significant revenue from the coal export industry. Further, there have been enormous investments in the fossil fuel industry.<sup>212</sup> As revenue generation is high, the LNG industry proposes an enormous escalation in the north of WA and in the Coal Seam Gas Industry in Queensland and NSW.<sup>213</sup>

### *2.3.2 Displacing Coal with Gas in Australia*

The Energy Minister, Angus Taylor, stated that the LNG industry is able to cut GHGe by 150 million tonnes a year.<sup>214</sup> Further, according to the Department of Environment and Energy, Australia's LNG exports for the year to March 2019 is able to reduce global emissions by 152 Mt CO<sub>2</sub>-e.<sup>215</sup> However, the quarterly updates of Australia's National Greenhouse Gas Inventory highlight annual rising emissions from 2014 onwards, till the slump in emissions with

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<sup>208</sup> Neil Gunningham, Megan Bowman, 'Energy regulation for a low carbon economy: Obstacles and opportunities' (2016) 33 *Environmental and Planning Law Journal* 118, 119.

<sup>209</sup> Kate McCallum, 'The War on Solar and Wind: Australian Renewable Energy Policy' (2017) 34 *Environmental and Planning Law Journal* 69, 71.

<sup>210</sup> Kate McCallum, 'The War on Solar and Wind: Australian Renewable Energy Policy' (2017) 34 *Environmental and Planning Law Journal* 69, 71.

<sup>211</sup> ABC News, 'Coal 'Good for Humanity', Prime Minister Tony Abbott says at \$3.9b Queensland mine opening' (Web Page, 13 October 2014) <<http://www.abc.net.au/news/2014-10-13/coal-is-good-for-humanity-pm-tony-abbott-says/5810244>>.

<sup>212</sup> More than \$10 billion per year of Government subsidies given to the fossil fuel industry. Source: The Australia Institute, *Why Do We Subsidise Industry?* (Web Page) <<https://www.tai.org.au/node/451>>.

<sup>213</sup> Angela Macdonald-Smith, 'Australia Beats Qatar to Become World's No. 1 LNG Exporter', *Financial Review* (Web Page, 6 January 2020) <<https://www.afr.com/companies/energy/australia-finally-claims-lng-crown-from-qatar-20200106-p53p4h>>; Queensland Government, *Petroleum and Coal Seam Gas* (Web Page, 10 January 2020) <<https://www.business.qld.gov.au/industries/mining-energy-water/resources/petroleum-energy/outlook-statistics/petroleum-gas>>.

<sup>214</sup> A. Morton, 'Fuelling The Climate Crisis: Why LNG Is No Miracle Cure For Australia's Coal Addiction', *The Guardian* (online, 7 July 2019) <<https://www.theguardian.com/australia-news/2019/jul/07/fuelling-the-climate-crisis-why-lng-is-no-miracle-cure-for-australias-coal-addiction>>.

<sup>215</sup> Department of the Environment and Energy, Parliament of Australia, *Australia's National Greenhouse Gas Inventory March 2019 Quarterly Update Released* (Web Page, 30 August 2019) <<https://www.minister.industry.gov.au/ministers/taylor/media-releases/australias-national-greenhouse-gas-inventory-march-2019-quarterly>>.

Covid-19.<sup>216</sup> The production of gas may displace coal within Australia and in overseas markets. Any reduction of GHGe from gas displacing coal in Australia and in the Australian export markets needs to be measured against the increase in emissions from producing and supplying gas and LNG.

Woodside's 2018 Sustainable Development report stated its goal to develop LNG and displace higher emissions fuels.<sup>217</sup> Woodside also claims that LNG can displace coal fired power stations.<sup>218</sup> It is argued that, theoretically, the burning of natural gas produces about half the amount of GHGe as to burning coal. Woodside cites that '44% less carbon dioxide produced by gas, versus coal'.<sup>219</sup> Woodside believes that the use of natural gas can help reduce global emissions<sup>220</sup> and is focusing on developing hydrogen<sup>221</sup>. Woodside also claims that gas is a natural step towards net zero.<sup>222</sup> However, the Director of the Australia Institute's Climate and Energy Program states that there is no clear evidence to show that increasing LNG exports was reducing GHGe.<sup>223</sup> There is no clear evidence to show that gas can displace coal and, if so, to what extent. The political and fossil fuel industry argument that natural gas can displace coal has not been supported by significant evidence to show that it is happening in Asia, which is the market for most of Australia's LNG.<sup>224</sup> As such, the Energy Minister's claim about displacing coal with gas does not make sense. Instead, all LNG plants must be required to have carbon capture and storage (CCS) technology installed.

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<sup>216</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2018* (Report, 2019) 57; Ndevr Environmental, *Tracking 2 Degrees – FY19 Q2* (Web Page)

<<http://ndevr.com.au/environmental/tracking-2-degrees-fy19-q2>>.

<sup>217</sup> Woodside, *Sustainable Development Report 2018* (Report, 2018) 26

<[https://files.woodside/docs/default-source/investor-documents/major-reports-\(static-pdfs\)/2018-sustainable-development-report/sustainable-development-report-2018.pdf?sfvrsn=55694111\\_21](https://files.woodside/docs/default-source/investor-documents/major-reports-(static-pdfs)/2018-sustainable-development-report/sustainable-development-report-2018.pdf?sfvrsn=55694111_21)>.

<sup>218</sup> Woodside, *Sustainable Development Report 2018* (Report, 2018) 26

<[https://files.woodside/docs/default-source/investor-documents/major-reports-\(static-pdfs\)/2018-sustainable-development-report/sustainable-development-report-2018.pdf?sfvrsn=55694111\\_21](https://files.woodside/docs/default-source/investor-documents/major-reports-(static-pdfs)/2018-sustainable-development-report/sustainable-development-report-2018.pdf?sfvrsn=55694111_21)>.

<sup>219</sup> Woodside, *Climate Change* (Web Page, November 2018)

<<https://www.woodside.com.au/sustainability/climate-change>>.

<sup>220</sup> Woodside, *Climate Change* (Web Page, accessed on 13 October 2020)

<<https://www.woodside.com.au/sustainability/climate-change>>.

<sup>221</sup> Woodside, *Hydrogen* (Web Page, accessed on 13 October 2020)

<<https://www.woodside.com.au/innovation/hydrogen>>.

<sup>222</sup> Woodside, *Climate Change* (Web Page, accessed on 13 October 2020)

<<https://www.woodside.com.au/sustainability/climate-change>>.

<sup>223</sup> Lisa Cox, 'Angus Taylor's Claim LNG Exports Reduce Global Emissions 'Likely Wrong' – Climate Expert', *The Guardian* (online, 7 June 2019)

<<https://www.theguardian.com/environment/2019/jun/07/angus-taylors-claim-lng-exports-reduce-global-emissions-likely-wrong-climate-expert>>.

<sup>224</sup> The expansion of natural gas is resulting in a slow decline of coal production in the United States and Europe. Source: C. Harvey and N. Gronewold, 'Greenhouse gas emissions to set new record this year, but rate of growth shrinks', *ScienceMag* (Web Page, 4 December 2019)

<<https://www.sciencemag.org/news/2019/12/greenhouse-gas-emissions-year-set-new-record-rate-growth-shrinks>>.

### 2.3.2(a) Gas Displacing Coal within Australia

Rising LNG production in Australia has driven up Australia's GHGe in the past few years. There has been a significant increase in Australia's GHGe, including Australian scope 3 emissions.<sup>225</sup> Natural gas produced in WA is mostly exported. However, about 15% of WA produced gas are reserved for use within WA.<sup>226</sup>

### 2.3.2(b) Gas Displacing Coal in Australia's Export Markets

As most gas produced in WA are exported, the gas is consumed by foreign entities, producing scope 3 emissions. Indirect emissions from the Australian fossil fuel industry (coal, oil, and gas) are significantly contributing to increasing global GHGe.<sup>227</sup> These scope 3 emissions are not reported under the National Greenhouse and Energy Reporting Scheme.<sup>228</sup>

In order to deal with scope 3 emissions, offsets from import countries could offset emissions in Australia.<sup>229</sup> Proponents could get credit for emissions reduction if the import country can certify that exported gas has been used to displace coal and reduce GHGe. However, current Commonwealth law does not accept international credits.<sup>230</sup> The argument

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<sup>225</sup> Scope 3 emissions are 'indirect greenhouse gas emissions other than scope 2 emissions that are generated in the wider economy. They occur as a consequence of the activities of a facility, but from sources not owned or controlled by that facility's business.' Source: Australian Government Clean Energy Regulator, *Greenhouse Gases and Energy* (Web Page, 20 July 2018) <<http://www.cleanenergyregulator.gov.au/NGER/About-the-National-Greenhouse-and-Energy-Reporting-scheme/Greenhouse-gases-and-energy>>.

<sup>226</sup> Government of Western Australia Department of Jobs, Tourism, Science and Innovation, *WA Domestic Gas Policy* (Web Page) <<https://www.jtsi.wa.gov.au/economic-development/economy/domestic-gas-policy>>.

<sup>227</sup> Department of the Environment and Energy, Parliament of Australia, *Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2018* (Report, 2019) 16, 57 <<https://www.environment.gov.au/system/files/resources/408fcc37-dcfd-4ab8-a4f9-facc6bd98ea6/files/nggi-quarterly-update-dec-2018.pdf>>; Ndevr Environmental, *Tracking 2 Degrees – FY19 Q2* (Web Page) <<http://ndevr.com.au/environmental/tracking-2-degrees-fy19-q2>>.

<sup>228</sup> Australian Government Clean Energy Regulator, *Greenhouse Gases and Energy* (Web Page, 20 July 2018) <<http://www.cleanenergyregulator.gov.au/NGER/About-the-National-Greenhouse-and-Energy-Reporting-scheme/Greenhouse-gases-and-energy>>.

<sup>229</sup> Environmental Protection Authority, Government of Western Australia, *Technical Guidance Mitigating Greenhouse Gas Emissions* (Report, March 2019) 4 <[http://www.epa.wa.gov.au/sites/default/files/Policies\\_and\\_Guidance/20180306%20EPA%20TG%20Mitigating%20Greenhouse%20Gas%20Emissions%20-%204.pdf](http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/20180306%20EPA%20TG%20Mitigating%20Greenhouse%20Gas%20Emissions%20-%204.pdf)>.

<sup>230</sup> *National Greenhouse and Energy Reporting Act 2007* (Cth) ss 22XD and 22XM.

of displacing coal with gas is political and, if the argument is true, it should be proven through the Environmental Impact Assessment process.

Australian and Norwegian oil and gas companies have proposed displacing coal with gas.<sup>231</sup> Woodside and Santos are slowly adopting RE strategies, but their businesses are mainly focused on oil and gas.<sup>232</sup> Woodside aspires to be net zero for its operations by 2050.<sup>233</sup> Equinor also argues that gas can displace coal in the European market reducing CO<sub>2</sub> emissions.<sup>234</sup>

### 2.3.3 Diversifying from Fossil Fuel to Renewable Sources in Norway

Norway has made moves to diversify from fossil fuel to renewable sources. This is evident as Norway's largest pension fund is selling off its investments in firms that explore for oil and gas.<sup>235</sup> The fund is investing money into RE projects.<sup>236</sup> In 2019, the Norwegian Parliament permitted the Government Pension Fund Global to invest in unlisted RE infrastructure.<sup>237</sup> Norway is diversifying because it is already using RE in their processing plants and it does not have the same level of industrial use as in Australia.

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<sup>231</sup> Woodside, *Climate Change* (Web Page) <<https://www.woodside.com.au/sustainability/climate-change>>.

<sup>232</sup> Woodside, *Gas and Solar: Partners in Power* (Web Page) <<https://www.woodside.com.au/news-and-media/stories/story/gas-and-solar-partners-in-power>>; Santos, *Santos rolls out renewable energy in the Cooper basin* (Web Page, 18 December 2018) <<https://www.santos.com/media-centre/announcements/santos-rolls-out-renewable-energy-in-the-cooper-basin/>>.

<sup>233</sup> Woodside, *Climate Change* (Web Page, accessed on 13 October 2020) <<https://www.woodside.com.au/sustainability/climate-change>>.

<sup>234</sup> Equinor, *Natural Gas* (Web Page, 2020) <<https://www.equinor.com/en/what-we-do/natural-gas.html>>.

<sup>235</sup> Rob Davies, 'Norway's \$1tn Wealth Fund To Divest From Oil And Gas Exploration', *The Guardian* (online, 9 March 2019 <<https://www.theguardian.com/world/2019/mar/08/norways-1tn-wealth-fund-to-divest-from-oil-and-gas-exploration>>; Government.no, *Excludes Exploration and Production Companies from the Government Pension Fund Global* (Web Page, 8 March 2019) <<https://www.regjeringen.no/en/aktuelt/excludes-exploration-and-production-companies-from-the-government-pension-fund-global/id2631707/>>.

<sup>236</sup> Damian Carrington, 'Historic Breakthrough': Norway's Giant Oil Fund Dives Into Renewables', *The Guardian* (online, 6 April 2019 <<https://www.theguardian.com/environment/2019/apr/05/historic-breakthrough-norways-giant-oil-fund-dives-into-renewables>>.

<sup>237</sup> Norges Bank, *Mandate for the Government Pension Fund Global – Investments in Renewable Energy Infrastructure* (Web Page, 13 September 2019) <<https://www.nbim.no/en/publications/submissions-to-ministry/2019/mandate-for-the-government-pension-fund-global--investments-in-renewable-energy-infrastructure/>>; Government.no, *Allowing for Unlisted Renewable Energy Infrastructure* (Web Page, 5 April 2019) <<https://www.regjeringen.no/en/aktuelt/allowing-for-unlisted-renewable-energy-infrastructure/id2640386/>>.

In the National Budget 2020, the Norwegian Government proposed a 5% increase on the carbon tax in 2020.<sup>238</sup> This approach is making it more expensive to pollute and cheaper to go green. There have been many policies and plans introduced by the Norwegian Government moving towards a net zero emissions society by 2050.

There have also been additional instruments used in Norway on RE: (a) green certificates – promote the use of renewable energy resources and renewable share requirement in energy production, (b) white certificates – promotes the efficient end use of energy and sets a requirement for demand side energy saving, and (c) brown certificates – cap and trade for GHGe which focuses on energy-intensive industries.<sup>239</sup>

Further, Equinor is also diversifying its business from fossil fuels to other renewable sources and low-carbon energy solutions. Equinor has promised to move from fossil fuels and is increasing its investment in RE.<sup>240</sup> However, it is still pursuing oil and gas explorations and exports very large volumes of natural gas to Europe.<sup>241</sup> Equinor also aims to reduce its net carbon intensity by at least 50% by 2050, and to improve RE capacity tenfold by 2026.<sup>242</sup> Conversely, Australia is concentrating more on displacing coal with gas. This is evident as Australia's gas production has been rising in the recent years. Both companies focus on developing oil and gas with renewables. Woodside claims that gas will partner with renewables,<sup>243</sup> while Equinor proposes decarbonising its oil and gas production 'growing within wind and solar'.<sup>244</sup>

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<sup>238</sup> Royal Ministry of Finance, *The National Budget 2020: A Summary* (Report, 2019-2020) <[https://www.regjeringen.no/contentassets/dd85dd71ed1847bbb518e5a8d4f5a97e/national\\_budget\\_2020.pdf](https://www.regjeringen.no/contentassets/dd85dd71ed1847bbb518e5a8d4f5a97e/national_budget_2020.pdf)>.

<sup>239</sup> Catherine Banet, 'The Use of Market-Based Instruments in The Transition from a Carbon-based Economy' in D. N. Zillman, C. Redgwell, Y. O. Omorogbe and L. K. Barrera-Hernandez, *Beyond the Carbon Economy: Energy Law in Transition* (Oxford University Press, 2008) 212-213.

<sup>240</sup> Equinor, *Renewables and CCS* (Web Page) <<https://www.equinor.com/en/what-we-do/new-energy-solutions.html#:~:targetText=Equinor%20Energy%20Ventures%20is%20our,of%20four%20to%20s even%20years.>>.

<sup>241</sup> Equinor, *Natural Gas* (Web Page, 2020) <<https://www.equinor.com/en/what-we-do/natural-gas.html>>.

<sup>242</sup> Equinor, *Equinor Sets Ambition to Reduce Net Carbon Intensity by at Least 50% by 2050* (Web Page, 6 February 2020) <<https://www.equinor.com/en/news/2020-02-06-climate-roadmap.html>>.

<sup>243</sup> Woodside, *Gas and Solar: Partners in Power* (Web Page, 15 November 2018) <<https://www.woodside.com.au/news-and-media/stories/story/gas-and-solar-partners-in-power>>.

<sup>244</sup> Equinor, *Renewables and CCS* (Web Page) <<https://www.equinor.com/en/what-we-do/new-energy-solutions.html#:~:targetText=Equinor%20Energy%20Ventures%20is%20our,of%20four%20to%20s even%20years.>>. However, Equinor was proposing to explore for oil and gas in the Arctic and in Australia's Southern Ocean, at the Great Australian Bight. In December 2019, Equinor withdrew from the Great Australian Bight. Source: Equinor, *Australia* (Web Page) <<https://www.equinor.com/en/where-we-are/australia.html>>.

## *Summary of Section 2*

Norway is in a better position than Australia in its RE development due to its experience in hydropower to generate electricity. As such, transitioning to EVs has been easier as opposed to Australia which mainly relies on fossil fuels for its electricity generation. The use of market-based instruments in Norway has also driven investment in RE and the reduction of emissions from the maritime industry and general industry. In contrast, Australia does not have a price on carbon and market-based instruments to regulate GHGe from the fossil fuel industry. Ultimately, this results in both countries having different arguments on the use of RE regarding emissions from the transportation sector and general industry emissions.

### **3.0 Barriers to Renewable Energy in Australia**

This section discusses the political, governmental, and economic barriers faced by Australia in RE development, barriers that Norway seems to have addressed better. Norway has popular and Governmental support for RE as it has a long-term legacy of hydropower development instead of coal development.

#### *3.1 Political Barrier*

The significant political barrier that Australia faces in RE development is the high dependence on the coal industry for electricity generation and mineral export revenue. Norway does not face this barrier as it does not have much coal and its economy is not founded on coal for electricity. How can we understand this political barrier in Australia?

Why is there political opposition to transitioning the Australian electricity industry to RE sources? There is consensus among the leading energy experts, scientists and authorities that Australia is technologically ready to move to a modern electricity network powered by renewables.<sup>245</sup> There is also popular support for a move to renewables. According to a Lowy Institute poll in 2018, 84% of Australians say that the 'Government should focus on renewables, even if this means we may need to invest more in infrastructure to make the system more reliable'.<sup>246</sup> However, the current Government is taking a different approach, and

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<sup>245</sup> Climate Council, *Politics preventing Australia's switch to 21<sup>st</sup> century energy* (Web Page, 4 October 2017) <<https://www.climatecouncil.org.au/resources/politics-preventing-australia-s-switch-to-21st-century-energy/>>.

<sup>246</sup> Lowy Institute, *2018 Lowy Institute Poll* (Web Page, 20 June 2018) <<https://www.lowyinstitute.org/publications/2018-lowy-institute-poll>>.

energy policies are failing.<sup>247</sup> The Government appears to be taking vested fossil fuel industry interests into consideration when determining policies at a federal level.<sup>248</sup> The Federal Government focuses on the reliability of electricity supply to disparage RE in Australia.<sup>249</sup> The response to this has been to look for storage solutions to make the use of RE more dependable.<sup>250</sup> There are also some technical barriers involved in switching to RE such as grid-related constraints.<sup>251</sup> In July 2020, the Australian Energy Market Operator (AEMO) introduced the Integrated System Plan to deliver low-cost, secure and reliable energy in Australia, acknowledging the use of RE at the utility level and augmenting the transmission grid to facilitate market access for new large scale renewable resources.<sup>252</sup> There is still a lot to be of work to be done in terms of adapting the grid and energy market to integrate with new RE projects and energy storage.

The economic dependence of Australia on the coal export industry for employment and public revenue is an equally difficult issue. Due to the enormous investments that are still being made in fossil fuel export projects, Australian Governments have earned large revenues from fossil fuel exports<sup>253</sup> and this has slowed progress towards RE export opportunities by the Morrison Government. Although Norway has followed more ambitious policies for the reduction of GHGe, it has been able to do so because it does not have an economy founded on coal for electricity. Norway has generated public wealth from the development of oil and gas, which it can use to transition its economy. Due to these factors, there are political barriers in Australia that are not prevalent in Norway.

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<sup>247</sup> M. Diesendorf, *Renewable Electricity Policy for Australia* (Report, November 2018) 3  
<<http://www.tai.org.au/sites/default/files/Renewable%20Electricity%20Policy%20for%20Australia%20%5BWeb%5D.pdf>>.

<sup>248</sup> M. Diesendorf, *Renewable Electricity Policy for Australia* (Report, November 2018) 3  
<<http://www.tai.org.au/sites/default/files/Renewable%20Electricity%20Policy%20for%20Australia%20%5BWeb%5D.pdf>>.

<sup>249</sup> Giles Parkinson, 'Blaming Renewables for Reliability Issues is "Wrong and Dangerous"', *Renew Economy* (Web Page, 11 February 2019) <<https://reneweconomy.com.au/blaming-renewables-for-reliability-issues-is-wrong-and-dangerous-43132/>>.

<sup>250</sup> ABC News, *Malcolm Turnbull says Renewables Plus Storage are Cheaper than Coal and Nuclear for Power Generation. Is He Correct?* (Web Page, 27 September 2019)  
<<https://www.abc.net.au/news/2019-09-12/is-renewable-power-cheaper-than-coal-nuclear-malcolm-turnbull/11495558>>.

<sup>251</sup> Rebecca Pearce, 'Moving targets: Carbon pricing, energy markets, and social movements in Australia' (2016) 25(6) *Environmental Politics* 1079, 1082 citing REN21, 2014. *Renewables 2014: global status report*. Paris: Renewable Energy Policy Network for the 21<sup>st</sup> Century.

<sup>252</sup> Australian Energy Market Operator, *2020 Integrated System Plan* (Report, July 2020) 9  
<<https://aemo.com.au/-/media/files/major-publications/isp/2020/final-2020-integrated-system-plan.pdf?la=en&hash=6BCC72F9535B8E5715216F8ECDB4451C>>.

<sup>253</sup> Adam Morton, 'Fossil Fuel Exports Make Australia One Of The Worst Contributors To Climate Crisis', *The Guardian* (online, 8 July 2019)  
<<https://www.theguardian.com/environment/2019/jul/08/fossil-fuel-exports-make-australia-one-of-the-worst-contributors-to-climate-crisis>>.



### 3.2 Governmental System Barrier

Australia has a federal system of government, and each State has its own laws on RE. Arguably, it is a difficult task to have a united legislative structure as State and Federal Governments have competing priorities.<sup>254</sup> It is arguable that harmonisation of RE laws would be better to ensure that all States develop RE. On the other hand, there are benefits in a federal system. States and territories such as ACT, Tasmania and SA have been able to lead the way in RE despite the lack of policy on a federal level. This is because these three jurisdictions lack supplies of fossil fuels. It is not possible to say whether Australia would better develop RE with greater national government leadership in harmonising the laws for RE development. The answer to this question requires further research, especially constitutional legal analysis.

The planning and approval process for a RE project is also a barrier in Australia due to its federal system of governance, and each State having different processes involved to ensure compliance and different authorities responsible for enforcement and compliance.<sup>255</sup> This barrier links to the political, administrative (i.e lengthy procedures for regulatory approval), and economic barriers. Norway is under a unitary system of Government. Each RE project needs a licence pursuant to the *Energy Act 1990*. The approval of the licence is decided by the Norwegian Water Resources and Energy Directorate and the Ministry of Petroleum and Energy.<sup>256</sup> The planning and approval process is beyond the scope of the thesis and no conclusion will be provided for these laws on RE.

### 3.3 Economic Barrier to Renewable Energy Investment

One economic barrier to RE investment is lower prices of fossil fuels due to government subsidies.<sup>257</sup> There are more government subsidies for fossil fuels compared to

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<sup>254</sup> L. Byrnes et al, 'Australian renewable energy policy: Barriers and challenges' (2013) 60 *Renewable Energy* 711, 711.

<sup>255</sup> Australian Government, *Planning and Compliance* (Web Page) <<https://www.nwfc.gov.au/planning-and-regulation>>.

<sup>256</sup> 'Renewable Energy Generation in Norway', *DLA Piper* (Web Page, October 2016) 3 <<https://www.dlapiper.com/~media/files/service-and-sector-highlights/renewable-energy-generation-in-norway.pdf>>.

<sup>257</sup> L. Byrnes and C. Brown, 'Australia's renewable energy policy: the case for intervention', *Munich Personal RePEc Archive* (Web Page, May 2015) 10 <[https://mpra.ub.uni-muenchen.de/64977/1/MPRA\\_paper\\_64977.pdf](https://mpra.ub.uni-muenchen.de/64977/1/MPRA_paper_64977.pdf)>; Dorcas Kariuki, 'Barriers to Renewable Energy Technologies Development', *Energy Today* (Web Page, 25 January 2018) <<https://www.energytoday.net/economics-policy/barriers-renewable-energy-technologies->

RE in Australia.<sup>258</sup> According to recent data, Australia's annual fossil fuel subsidies amount to a total of AUD\$29 billion.<sup>259</sup> This is an astonishing figure, and arguably part of these subsidies could be used towards the development of RE. The Clean Energy Council notes that clean energy investment requires a 'long-term energy policy certainty'.<sup>260</sup>

Of course, Government investment and subsidies can also be used to support RE development. One of the biggest hurdles in transiting to RE is the cost incurred to introduce the technologies which require very high up-front capital costs.<sup>261</sup> There is also cost involved to connect a wind or solar farm to the grid due to the distance involved. In 2010, RE technologies were more expensive than fossil fuel sources.<sup>262</sup> However, as RE technology improves and becomes more available, wholesale prices have fallen, making it more affordable.<sup>263</sup> From 2018 onwards, wind and solar capacity have increased in the global market, reducing wholesale prices. The cost of new wind and solar generation is currently lower than new coal generation.<sup>264</sup> Malcolm Turnbull recently claimed that RE sources are cheaper than coal and nuclear for electricity generation.<sup>265</sup> The International Renewable Energy Agency also claimed that the costs of RE technologies declined in 2018.<sup>266</sup>

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development/"; Seetharaman et al, 'Breaking barriers in deployment of renewable energy' (2019) 5(1) *Heliyon* 1, 5.

<sup>258</sup> Seetharaman et al, 'Breaking barriers in deployment of renewable energy' (2019) 5(1) *Heliyon* 1, 5; T. Berrill, 'The Renewable Energy Revolution Making it happen in the Sunshine State' (Sustainable Queensland Submission to Queensland RE expert panel Issues Paper May 2016, June 2016) 12 <[https://renew.org.au/wp-content/uploads/2018/08/Sustainable\\_Queensland\\_50pc\\_RE\\_issues\\_paper\\_submission\\_Jun\\_2016.pdf](https://renew.org.au/wp-content/uploads/2018/08/Sustainable_Queensland_50pc_RE_issues_paper_submission_Jun_2016.pdf)>.

<sup>259</sup> Michael Mazengarb, 'Global fossil fuel subsidies reach \$5.2trillion, and \$29billion in Australia', *Renew Economy* (Web Page, 13 May 2019) <<https://reneweconomy.com.au/global-fossil-fuel-subsidies-reach-5-2-trillion-and-29-billion-in-australia-91592/>>.

<sup>260</sup> Clean Energy Council, *Clean Energy Australia Report 2019* (Report, 2019) 17 <<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2019.pdf>>.

<sup>261</sup> Dorcas Kariuki, 'Barriers to Renewable Energy Technologies Development', *Energy Today* (Web Page, 25 January 2018) <<https://www.energytoday.net/economics-policy/barriers-renewable-energy-technologies-development/>>; L. Byrnes et al, 'Australian renewable energy policy: Barriers and challenges' (2013) 60 *Renewable Energy* 711, 714.

<sup>262</sup> Nicola Durrant, *Legal Responses to Climate Change* (Federation Press, 2010) 127.

<sup>263</sup> Zsuzsanna Csereklyei, Songze Qu and Tihomir Ancev, 'The effect of wind and solar power generation on wholesale electricity prices in Australia' (2019) 131 *Energy Policy* 358, 365.

<sup>264</sup> Clean Energy Council, *Clean Energy Australia Report 2019* (Report, 2019) 5 <<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2019.pdf>>.

<sup>265</sup> ABC News, 'Malcolm Turnbull says renewables plus storage are cheaper than coal and nuclear for new power generation. Is he correct?', (Web Page, 27 September 2019) <<https://www.abc.net.au/news/2019-09-12/is-renewable-power-cheaper-than-coal-nuclear-malcolm-turnbull/11495558>>.

<sup>266</sup> IRENA, *Renewable Power Generation Costs in 2018* (Web Page, May 2019) <<https://www.irena.org/publications/2019/May/Renewable-power-generation-costs-in-2018>>.

The Australian Government has provided funding for RE. According to the CEFC, there has been more than AUD\$2 billion investment in RE projects between 2016 and 2017.<sup>267</sup> In October 2019, the Australian Government pumped AUD\$1 billion to the CEFC for clean energy projects aiming to ensure reliable electricity supply.<sup>268</sup>

This situation can be compared with Norway, where the Norwegian Government is willing to spend initially on RE from the revenues generated by the carbon tax. Despite being a small country and having a small population compared to Australia, in 2019, the Norwegian Government increased RE funding to more than NOK1 billion (approximately AUD\$152.46 million).<sup>269</sup> Norway also does not have the hurdle of transitioning from coal to RE for electricity generation.

### *Summary of Section 3*

Barriers to RE are prevalent in Australia as the country's economy is highly dependent on the revenues from the fossil fuel industry. Despite these barriers, Australia is making progress in RE development: total electricity generation from renewable sources increased in 2019 by about 3% compared to 2018.<sup>270</sup> However, the bigger cost for Australia is the transition away from coal operating across the 'ecological, social, and economic domains'.<sup>271</sup> There has been strong environmental lobby against the coal export industry. As such, moving to RE for domestic electricity and winding down the coal export industry is a big challenge for Australia.

## **Conclusion**

RE can be used to reduce emissions in Australia. However, there is still a lot to be done in Australia in terms of adapting the grid and energy market to integrate new RE projects and energy storage in the electricity sector. Australia is slowly shifting towards cleaner energy

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<sup>267</sup> Clean Energy Finance Corporation, *Annual Report 2016-17* (Report, 2017) 9

<<https://annualreport2017.cefc.com.au/media/1399/cefc-annual-report-2017.pdf>>.

<sup>268</sup> Australian Associated Press, 'Coalition Pumps \$1bn Into Clean Energy Projects To Stabilise Grid', *The Guardian* (online, 30 October 2019) <<https://www.theguardian.com/australia-news/2019/oct/30/coalition-pumps-1bn-into-clean-energy-projects-to-stabilise-grid>>.

<sup>269</sup> Government.no, *More Than A Billion Kroner for Renewable Energy* (Web Page, 8 October 2018) <[https://www.regjeringen.no/en/aktuelt/renewable\\_energy/id2613723/](https://www.regjeringen.no/en/aktuelt/renewable_energy/id2613723/)>.

<sup>270</sup> Clean Energy Council, *Clean Energy Australia Report 2020* (Report, 2020) 9

<<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2020.pdf>>; Clean Energy Council, *Clean Energy Australia Report 2019* (Report, 2019) 9 <<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2019.pdf>>.

<sup>271</sup> Geoff Evans and Liam Phelan, 'Transitioning to a post-carbon society: Linking environmental justice and just transition discourses' (2016) 99 *Energy Policy* 329, 336.

in the electricity sector to reduce emissions by increasing wind and solar power generation. Norway is in a better position due to its hydropower history resulting in lower emissions from the electricity sector.

Despite the absence of a federal RET providing ongoing support for RE in Australia, RE is developing. States (for example, Tasmania and SA) are currently taking the lead on RE development in the absence of federal policy. The absence of a RET after 2020 has impacted RE investment in 2019.<sup>272</sup> It is useful to have a legislated RET fostering the development of RE. This will provide a level of certainty aiming to meet the *PA* targets. It is not possible to say whether Norway's unitary system is better than Australia's federal system in regulating RE. This requires further research and analysis.

Besides a federal RET, certain policies should be implemented at the federal level to increase the success of RE in Australia. These policies are to: (a) encourage use of EVs; (b) encourage batteries to rooftop solar panels; (c) reduce/remove subsidies on production and use of fossil fuels; and (d) encourage the use of other renewable sources (i.e. hydrogen). Electricity sourced from RE can increase the uptake of EVs and reduce emissions in Australia's transportation sector and electricity sector. Norway is at an advantage in terms of the very high level of RE in the electricity sector contributing to the uptake of EVs.

A carbon tax and ETS would help Australia enormously to make a quicker transition to RE. Australia's general industry emissions have also been rising significantly due to LNG production. The use of market-based instruments in Norway have been the driving force of investment in RE to deal with the emissions from the maritime industry and general industry emissions, which is absent in Australia. Financial support and subsidies encouraging fossil fuels in Australia makes it harder for RE to compete. If financial support is reduced for fossil fuels and if there is a carbon tax or ETS in place making fossil fuel more expensive, then RE would be an option for general industry. Further, revenues generated from a carbon tax can also be channelled towards RE development. The carbon price introduced through the CPM in 2011 made RE more economically competitive.<sup>273</sup> RE combined with a carbon price is

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<sup>272</sup> Clean Energy Council, *Australia's Clean Energy Investment Outlook* (Report, 11 September 2019) 2 <<https://assets.cleanenergycouncil.org.au/documents/resources/reports/CEC-briefing-paper-Australias-clean-energy-investment-outlook-September-2019.pdf>>; K. Murphy, 'Clean Energy Investment Falls Back To 2016 Levels Amid Policy Uncertainty', *The Guardian* (online, 11 September 2019 <<https://www.theguardian.com/australia-news/2019/sep/11/clean-energy-investment-falls-back-to-2016-levels-amid-policy-uncertainty>>).

<sup>273</sup> K. McCallum, 'The War on Solar and Wind: Australian Renewable Energy Policy' (2017) 34 *Environmental and Planning Law Journal* 69, 71.

effective to transition into a low emissions economy because the existence of a CPM and ETS can push people to find alternatives to fossil fuels.

Australia needs political consensus and policy certainty<sup>274</sup> in energy law. Without this it would be difficult for the RE sector to reach its full potential.<sup>275</sup> Australia also needs to reduce its dependence on the fossil fuel industry and replace it with RE to meet domestic energy demands. There needs to be full decarbonisation of electricity generation by 2050, mainly through increased use of RE. This point is contentious because the Australian economy is highly dependent on the fossil fuel industry. In recent years, there is significant investment made towards the gas industry. The fossil fuel industry has gained political support, which has slowed the development of RE. This position is slowly changing as oil and gas companies are investing and providing support for the transition to RE.<sup>276</sup>

RE is an effective instrument to reduce emissions and create job opportunities. As Australia possesses a high amount of renewable resources, it has the potential to be a RE superpower, exporting RE to other countries, similar to Norway. The biggest challenge for Australia is to wind down the coal export industry and move towards RE for domestic electricity.

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<sup>274</sup> Clean Energy Council, *Clean Energy Australia Report 2019* (Report, 2019) 17 <<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2019.pdf>>..

<sup>275</sup> J. Prest, 'Australian Renewable Energy Law: Carbon Lock-in or Clean Energy Transition' (2018) 9(1) *Renewable Energy Law and Policy* 44, 67.

<sup>276</sup> Woodside, *Gas and Solar: Partners in Power* (Web Page) <<https://www.woodside.com.au/news-and-media/stories/story/gas-and-solar-partners-in-power>>; Santos, *Santos rolls out renewable energy in the Cooper basin* (Web Page, 18 December 2018) <<https://www.santos.com/media-centre/announcements/santos-rolls-out-renewable-energy-in-the-cooper-basin/>>.

## Chapter 6: Carbon Capture and Storage in Australia and Norway

### Introduction

It is impossible to stop the burning of fossil fuels immediately because of the time it takes to transition to alternative energy sources with lower or no greenhouse gas emissions (GHGe). However, it could be feasible to implement 'carbon sequestration' immediately (in relative terms) as a technique to reduce GHGe from the existing use of fossil fuels. Carbon sequestration is a 'process of capturing and storing atmospheric carbon dioxide'<sup>1</sup> securely for at least three decades. There are two types of carbon sequestration: (1) carbon capture and storage (CCS), which is usually conceived of as geological sequestration (geo-sequestration),<sup>2</sup> and (2) increasing the removal of carbon from the atmosphere by enhancing the natural process such as forestation, which is usually conceived of as 'biological sequestration' (bio-sequestration).<sup>3</sup> Norway has been growing forests which forms substantial carbon sinks to offset emissions.<sup>4</sup> Carbon sequestration can reduce the amount of carbon dioxide (CO<sub>2</sub>) in the atmosphere and reduce the impact caused by fossil fuels to achieve the *Paris Agreement (PA) 2015*<sup>5</sup> temperature goal. The Intergovernmental Panel on Climate Change has acknowledged CCS as a tool for reducing GHGe.<sup>6</sup> This chapter will focus on geo-sequestration, primarily CCS.

CCS provides the fossil fuel industry with a sense of energy security.<sup>7</sup> This chapter highlights the development of CCS in Australia and Norway as the two countries have different histories of CCS development. Norway has been a pioneer in the adoption of CCS because it was the preferred choice for the Norwegian oil and gas industry to reduce paying high amounts

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<sup>1</sup> USGS, *What is Carbon Sequestration* (Web Page) <[https://www.usgs.gov/faqs/what-carbon-sequestration?qt-news\\_science\\_products=0#qt-news\\_science\\_products](https://www.usgs.gov/faqs/what-carbon-sequestration?qt-news_science_products=0#qt-news_science_products)>.

<sup>2</sup> Geo-sequestration 'involves the deep geological storage of carbon dioxide from major industrial sources, providing a potential solution for reducing the rate of increase of atmospheric concentrations of carbon dioxide and mitigating climate change.' Source: Thomas L. Davis, Martin Landrø and Malcolm Wilson, *Geophysics and Geosequestration* (Cambridge University Press, 2019) Title Page.

<sup>3</sup> Carbon Capture & Sequestration Technologies, *About the MIT CC & ST Program* (Web Page) <<https://sequestration.mit.edu/>>.

<sup>4</sup> Climate Action Tracker, *Norway* (Web Page, 2 December 2019) <<https://climateactiontracker.org/countries/norway/>>. This will not be discussed further as it is beyond the scope of the thesis.

<sup>5</sup> *Paris Agreement*, opened for signature 12 December 2015, [2016] ATS 24 (entered into force 09 November 2016) ('*Paris Agreement*').

<sup>6</sup> B. Metz et al, *IPCC Special Report on Carbon Dioxide Capture and Storage* (Cambridge University Press, 2005) 3.

<sup>7</sup> D. Thronicker and I. Lange, 'Determining the Success of Carbon Capture and Storage Projects' (Conference Paper, CESifo Area Conference on Energy and Climate Economics, 17-18 October 2014) 2.

of carbon tax. Although there has been some controversy in both countries over CCS development in the political and policy sphere, the rationale of the chapter is to understand what Australia can learn from Norwegian legislation and policies on CCS by comparing how CCS policies evolved in both countries as a mechanism to reduce GHGe. The comparison is beneficial as Norway has more than 20 years' experience of CCS and the Norwegian CCS has valuable characteristics in terms of addressing liability issues and the transfer of responsibility. Australia also has some level of CCS experience and this is seen in the Gorgon project. The Environmental Protection Authority (EPA) has reviewed the failure of Chevron to sequester its CO<sub>2</sub> reservoir at its Gorgon project on Barrow Island, North West coast of WA.<sup>8</sup> The EPA is still inquiring on Gorgon's reservoir carbon dioxide injection system to ensure compliance with Condition 26 of Ministerial Statement 800<sup>9, 10</sup>

## 1.0 Practical Circumstances of Carbon Capture and Storage in Each Country

The section below discusses the willingness of the Australian and Norwegian Governments to invest in CCS projects. Section 1.2 provides a brief overview of CCS and how it operates. Section 1.3 discusses CCS development in Australia and Norway focusing on the Gorgon, Sleipner, and Snøwhit projects.

### 1.1 Different Views of Countries on Carbon Capture and Storage Development

The Norwegian Government has extensively funded energy research, development and demonstration projects, including the funding of the Sleipner and Snøwhit large scale CCS

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<sup>8</sup> Environment Protection Authority, Parliament of Western Australia, *Gorgon Gas Development: Barrow Island Nature Reserve* (Report, June 2006)

<[http://www.epa.wa.gov.au/sites/default/files/EPA\\_Report/B1221.pdf](http://www.epa.wa.gov.au/sites/default/files/EPA_Report/B1221.pdf)>.

<sup>9</sup> Condition 26 of Ministerial Statement 800 requires "Chevron to design and construct a carbon dioxide injection system that is capable of disposing 100 per cent of the reservoir carbon dioxide removed during routine gas processing operations from the proposal, through underground injection. This condition states Chevron should implement all practicable means to inject underground all reservoir carbon dioxide and ensure at least 80 per cent of reservoir carbon dioxide removed during gas processing operations on Barrow Island must be injected over a five-year rolling average." Source: Environmental Protection Authority, Parliament of Western Australia, *Gorgon Gas Development Revised and Expanded Proposal: Barrow Island Nature Reserve – inquiry under section 46 of the Environmental Protection Act 1986 to amend Ministerial Statement 800* (Report 1649, September 2019) <[https://www.epa.wa.gov.au/sites/default/files/EPA\\_Report/2818-19%20-%20Gorgon%20Gas%20Development%20Revised%20and%20Expanded%20Proposal%20-%20EPA%20Report\\_0.pdf](https://www.epa.wa.gov.au/sites/default/files/EPA_Report/2818-19%20-%20Gorgon%20Gas%20Development%20Revised%20and%20Expanded%20Proposal%20-%20EPA%20Report_0.pdf)> 4.

<sup>10</sup> Environmental Protection Authority, Parliament of Western Australia, *Gorgon Gas Development Revised and Expanded Proposal: Barrow Island Nature Reserve – inquiry under section 46 of the Environmental Protection Act 1986 to amend Ministerial Statement 800* (Report 1649, September 2019) <[https://www.epa.wa.gov.au/sites/default/files/EPA\\_Report/2818-19%20-%20Gorgon%20Gas%20Development%20Revised%20and%20Expanded%20Proposal%20-%20EPA%20Report\\_0.pdf](https://www.epa.wa.gov.au/sites/default/files/EPA_Report/2818-19%20-%20Gorgon%20Gas%20Development%20Revised%20and%20Expanded%20Proposal%20-%20EPA%20Report_0.pdf)> 4.

projects.<sup>11</sup> Whilst Western Australia (WA) and Chevron, an international company, have also adopted a CCS strategy for the Gorgon project, which came into operation in August 2019.

The Norwegian Government and oil and gas companies have shown that they are more willing to invest in technologies which reduce GHGe,<sup>12</sup> partly because of the wealth the country possesses and the level of seriousness on environmental matters. Australia, on the other hand, has been struggling to develop CCS due to several existing barriers, which are discussed in section 2.0. As CCS projects involve high costs, the Australian Government has provided some level of investment in CCS development.<sup>13</sup> In September 2008, the Rudd Government promised to spend \$315 million on CCS.<sup>14</sup> Another case in point is the Gorgon project which received \$60 million funding from the Federal Government.<sup>15</sup> After many years of struggle, the Gorgon project came into operation recently in August 2019.<sup>16</sup>

Norway had political support and its barriers to CCS development were relatively low compared to Australia. There was investment willingness and acceptance among the different stakeholders (the Government, major industrial players, and environmental protection groups or agencies) involved. As such, CCS development was much faster in Norway.

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<sup>11</sup> International Energy Agency, 'Energy Policies of EIA Countries: Norway 2017 Review' (Web Page) <<http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>> 11, archived at <<https://web.archive.org/web/20180919222931/http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>>.

<sup>12</sup> Priyanka Shrestha, 'Norway Proposes to Invest £54m in CCS Projects in 2020', *Energy Live News* (Web Page, 8 January 2020) <<https://www.energylivenews.com/2020/01/08/norway-proposes-to-invest-54m-in-ccs-projects-in-2020/>>; Jo-Kristian S. Røttereng, 'When climate policy meets foreign policy: Pioneering and national interest in Norway's mitigation strategy' (2018) 39 *Energy Research & Social Science* 216, 219; Government.no, *CCS in Norway* (Web Page, 8 January 2020) <<https://www.regjeringen.no/en/topics/energy/carbon-capture-and-storage/ccs-in-norway/id2601471/>>; IEA, *Tracking Power* (Web Page, May 2019) <<https://www.iea.org/reports/tracking-power-2019/ccus-in-power>>.

<sup>13</sup> Jonathan Paul Marshall, 'Disordering fantasies of coal and technology: Carbon capture and storage in Australia' (2016) 99 *Energy Policy* 288, 295-296.

<sup>14</sup> Michael Atkin, 'Cloud Hangs Over Rudd's Clean Coal Vision', *ABC News* (Web Page, 9 October 2014) <<https://www.abc.net.au/news/2012-02-14/rudd-carbon-capture-storage-institute/3769936>>.

<sup>15</sup> Adam Morton, 'Gorgon LNG Plant Begins Long-Delayed Carbon Capture and Storage Project', *The Guardian* (online, 8 August 2019) <<https://www.theguardian.com/australia-news/2019/aug/08/gorgon-lng-plant-begins-long-delayed-carbon-capture-and-storage-project>>.

<sup>16</sup> Chevron Australia, *Media Statement: Safe start up and operation of the carbon dioxide injection system at the Gorgon natural gas facility* (Web Page) <<https://australia.chevron.com/news/2019/carbon-dioxide-injection>>.



## 1.2 Overview of Carbon Capture and Storage

In simple terms, CCS means trapping the emissions from the source and storing them in underground reservoirs.<sup>17</sup> It is a 'process of transforming carbon emissions into a liquid form in order to inject them into subsurface reservoirs and thereby avoid CO<sub>2</sub> emissions.'<sup>18</sup> The separation of CO<sub>2</sub> from other gases is expensive due to the technological costs and expertise it requires.

CCS is a technology to prevent large quantities of CO<sub>2</sub> from being released into the atmosphere. It involves three essential elements: (a) capture, (b) transport, and (c) storage. CO<sub>2</sub> is captured from major energy emission sources, such as large power plants, refineries, and other large industrial emitting sources. It is then compressed and transported via pipelines, trucks or ships to a site for underground storage.<sup>19</sup>

CCS is a form of geo-sequestration.<sup>20</sup> The process involves high risk activities and requires a high degree of certainty in the storage site and the processes involved. The CCS system is complex and highly technical which involves a number of processes before the CO<sub>2</sub> can be stored into the sub-seabed.<sup>21</sup> The complexity of the system requires long term monitoring. Therefore, experienced and skillful people are needed to carry out these projects. As such, the law on CCS is important to ensure that it operates in a safe manner. CCS is safe now due to technological advancement and tighter regulations.<sup>22</sup> Section 1.3 discusses the technical development of CCS in Australia and Norway, and section 3.0 discusses the development of the legal regulation of CCS in the two countries.

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<sup>17</sup> J. Meadowcroft and O. Langhelle, *Caching the Carbon: The Politics and Policy of Carbon Capture and Storage* (Edward Elgar Publishing Limited, 2009) 1.

<sup>18</sup> S. Hepburn, *Mining and Energy Law* (Cambridge University Press, 2015) 280.

<sup>19</sup> W. Ze, Zhang Hongwei and Xie Lei, *Investigation of the Long Term Viability of Carbon Capture and Storage (CCS) Technology* (Report) 15 <[https://www.jtsi.wa.gov.au/docs/default-source/default-document-library/investigation-of-long-term-viability-of-carbon-capture-and-storage-technology.pdf?sfvrsn=d886f1c\\_2](https://www.jtsi.wa.gov.au/docs/default-source/default-document-library/investigation-of-long-term-viability-of-carbon-capture-and-storage-technology.pdf?sfvrsn=d886f1c_2)>.

<sup>20</sup> Geosequestration is a process of 'capturing carbon dioxide (CO<sub>2</sub>) from major stationary sources (such as power stations), transporting that CO<sub>2</sub> (usually by a pipeline) and then injecting it into a suitable geological formation.' Source: House of Representatives Science and Innovation Committee, Parliament of Australia, *Inquiry into Geosequestration* (Cooperative Research Centre for Greenhouse Gas Technologies Submission) 4 <[https://www.aph.gov.au/Parliamentary\\_Business/Committees/House\\_of\\_Representatives\\_Committees?url=scin/geosequestration/subs/sub36.pdf](https://www.aph.gov.au/Parliamentary_Business/Committees/House_of_Representatives_Committees?url=scin/geosequestration/subs/sub36.pdf)>.

<sup>21</sup> J. Meltzer, Nathan Hultman and Claire Langley, 'Low-Carbon Energy Transitions in Qatar and The Gulf Cooperation Council Region', *Global Economy and Development* (Web Page, February 2014) 19 <<https://www.brookings.edu/wp-content/uploads/2016/07/low-carbon-energy-transitions-qatar-meltzer-hultman-full.pdf>>.

<sup>22</sup> Global CCS Institute, *Understanding CCS* (Web Page) <<https://www.globalccsinstitute.com/why-ccs/what-is-ccs/>>.

### *1.3 Development of Carbon Capture and Storage in Australia and Norway*

CCS is an attractive option in Australia to secure Australia's coal and gas business by avoiding the closure of existing coal-fired power stations. Norway, on the other hand, developed CCS as a result of the introduction of the carbon tax on its oil and gas industry. The approach taken by both countries on CCS will be discussed with a focus, in Australia, on the Gorgon project, the Collie-South West CO<sub>2</sub> Geosequestration Hub project, and the CarbonNet project, and in Norway on the Sleipner and Snøwhit projects, and other CCS projects such as the Norcem project, Fortum Oslo Varme project and the Northern Lights CCS project.

#### *1.3.1 Carbon Capture and Storage Projects in Australia*

Australia is heavily dependent on its fossil fuel industry resources, which generate high export revenues for the country. As a result, GHGe from the fossil fuel industry have been rising.<sup>23</sup> CCS is an attractive technique for Australia to implement while continuing to develop its fossil fuel industry. Australia has been making efforts to develop CCS in the past two decades. The first geo-sequestration project in Australia was the Otway project in Victoria, proposed in 1998; it started operation in 2008.<sup>24</sup> Currently, there is only one large CCS project in Australia which is the Gorgon project. The development of this project has been accompanied by the enactment of the Commonwealth offshore CCS legislation, called the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth).

In late 2001, Chevron started discussions with the WA Government about the potential of developing the Gorgon project.<sup>25</sup> The Gorgon project is an unincorporated joint venture between Chevron (as the operator holding 50% interest), ExxonMobil (5%), and Shell (25%).<sup>26</sup> These joint venture partners intended to develop gas fields called Greater Gorgon, which are located about 130km off the north-west coast of WA.<sup>27</sup> The intention was to produce liquefied natural gas (LNG) for export and supply gas for domestic use.

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<sup>23</sup> Ndevr Environmental, *Tracking 2 Degrees – FY19 Q2* (Web Page) <<http://ndevr.com.au/environmental/tracking-2-degrees-fy19-q2>>.

<sup>24</sup> J. P. Marshall, 'Disordering fantasies of coal and technology: Carbon capture and storage in Australia' (2016) 99 *Energy Policy* 288, 291; Carbon Capture & Sequestration Technologies, *Otway Fact Sheet: Carbon Dioxide Capture and Storage Project* (Web Page) <<https://sequestration.mit.edu/tools/projects/otway.html>>.

<sup>25</sup> R. Lagdon and D. Moro, 'The Gorgon gas development and its environmental commitments' (2013) 83 009-011 *Records of the Western Australia Museum Supplement* 9, 10.

<sup>26</sup> M. Flett et al, 'Subsurface development of CO<sub>2</sub> disposal for the Gorgon Project' (2009) 1 *Energy Procedia* 3031, 3031.

<sup>27</sup> R. E. Hester and R. M. Harrison, *Carbon Capture: Sequestration and Storage* (Royal Society of Chemistry, 2010) 83.

Chevron published the Environmental Social and Economic Review report of the Gorgon project in 2003. In the same year, the WA Government passed the *Barrow Island Act 2003 (WA) (BIA 2003)*. Subsequently, there was an agreement signed between the Western Australian State Government and the joint venture partners to 'minimise environmental disturbance' on Barrow Island.<sup>28</sup> According to the *BIA 2003*, there needs to be compliance with the *Environmental Protection Act 1986 (WA)*.<sup>29</sup> The *BIA 2003* allowed the Environmental Impact Assessment (EIA) to be carried out on the Gorgon project. The proposal was also assessed under the *Environment Protection and Biodiversity Conservation Act 1999 (Cth)* on matters of national environmental significance to protect the endangered species. This is because the Gorgon project is located on Barrow Island's Class A nature reserve<sup>30</sup> and must be protected.

The EPA assessment also raised many environmental concerns because Barrow Island is home to flatback turtles and endangered species. Due to these concerns, the project went through a detailed EIA. Approvals were given in 2007 and 2009.<sup>31</sup> However, there were some technical problems and the project was not able to sequester emissions as it had planned to in the first few years of its operation. As a result, there were additional emissions. The approval given by the Federal Government does not require the Gorgon project to sequester emissions.<sup>32</sup> However, emissions from this project are subject to the Safeguard Mechanism.<sup>33</sup> Despite many hurdles, sequestration was managed through the EIA at the Gorgon project. The project safely started CCS operations in August 2019.<sup>34</sup>

The Gorgon project has cost more than US\$54 billion.<sup>35</sup> The high initial cost required to start a CCS project is a disadvantage for many countries. As explained below, the Australian

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<sup>28</sup> *Barrow Island Act 2003 (WA)*.

<sup>29</sup> *Barrow Island Act 2003 (WA)* s 2(3) sch 1.

<sup>30</sup> According to *Land Administration Act 1997 (WA)* s 41, 'the Minister may by order reserve Crown land to the Crown for one or more purposes in the public interest.' See *Land Administration Act 1997 (WA)* s 42 on Class A reserves. An A Class Reserve 'is the most highly protected class of crown land in Australia.' Source: Department of Resources, Energy and Tourism, Parliament of Australia, *Western Australia Greenhouse Gas Capture and Storage A Tale of Two Projects* (Report) 7 <[http://www.ccsassociation.org/index.php/download\\_file/view/536/98/](http://www.ccsassociation.org/index.php/download_file/view/536/98/)>.

<sup>31</sup> R. Lagdon and D. Moro, 'The Gorgon gas development and its environmental commitments' (2013) 83 009-011 *Records of the Western Australia Museum Supplement* 9, 10.

<sup>32</sup> Parliament of Australia, *Questions on Notice (No. 163)* (Web Page) <<https://www.aph.gov.au/api/qon/downloadestimatesquestions/EstimatesQuestion-Committeeld8-EstimatesRoundld3-Portfoliold10-QuestionNumber163>>.

<sup>33</sup> The Safeguard Mechanism is discussed in Chapter 2 section 3.2.2.

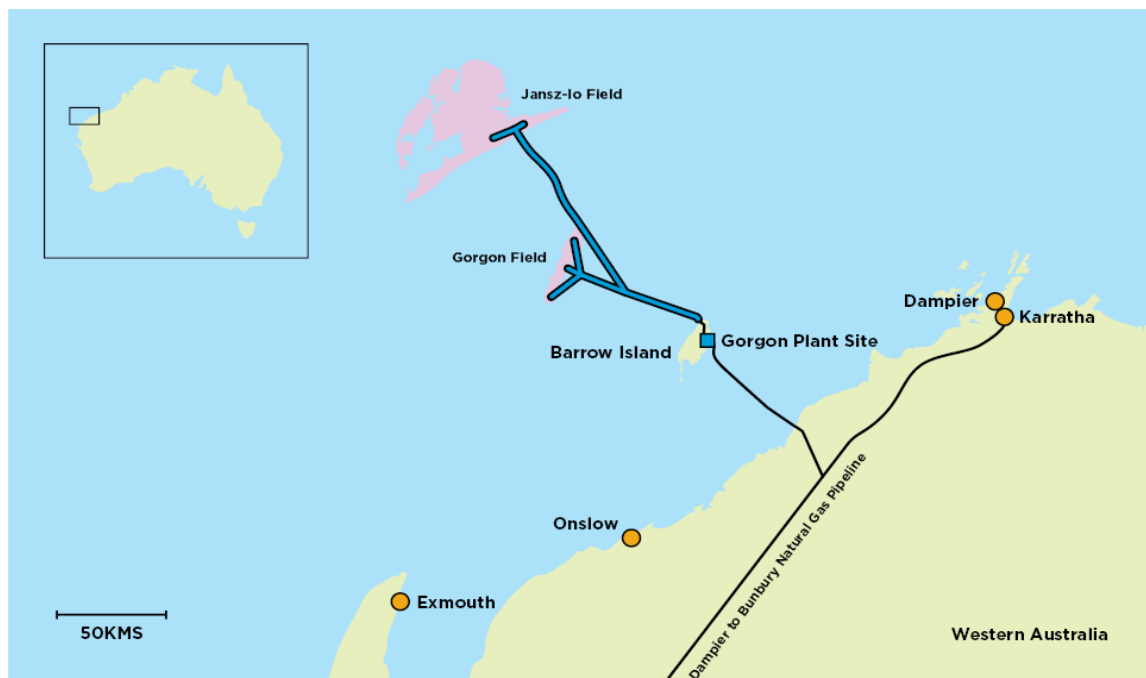
<sup>34</sup> Chevron, *Gorgon* (Web Page) <<https://www.chevron.com/projects/gorgon>>.

<sup>35</sup> P. Milne, 'Do Your Homework: Chevron's Outgoing Chief John Watson Learns From Gorgon Mistakes', *The West Australian* (online, 30 October 2017) <<https://thewest.com.au/business/oil-gas/do-your-homework-chevrons-outgoing-chief-john-watson-learns-from-gorgon-mistakes-ng-b88643593z>>.

Government gave financial support for the Gorgon CCS project. Even though fossil fuel companies have large revenues and could afford to make this investment, the Australian Government contributed \$60 million towards the cost of this project.<sup>36</sup>

The Gorgon project intends to capture CO<sub>2</sub> from the Gorgon and Jansz gas fields and store it in the subsurface at the Dupuy Formation.<sup>37</sup> Chevron's proposal was to inject CO<sub>2</sub> more than 2000 metres under the surface of Barrow Island. This project aims to reduce GHGe by about 40%<sup>38</sup> and can store five times more of CO<sub>2</sub> at a deeper level compared to the Sleipner project in Norway.<sup>39</sup>

**Figure 8: Gorgon project map<sup>40</sup>**



<sup>36</sup> Australian Government Department of Industry, Science, and Energy Resources, *Low Emissions Technology Development Fund* (Web Page, 22 October 2019) <<https://www.industry.gov.au/funding-and-incentives/low-emissions-technology-development-fund>>.

<sup>37</sup> Environment Protection Authority, *Gorgon Gas Development Barrow Island Nature Reserve* (Report/Bulletin 1221, June 2006) 56 <[http://www.epa.wa.gov.au/sites/default/files/EPA\\_Report/B1221.pdf](http://www.epa.wa.gov.au/sites/default/files/EPA_Report/B1221.pdf)>

<sup>38</sup> 'Factsheet: Gorgon Carbon Dioxide Injection Project', *Chevron* (Web Page, 2019) <<https://australia.chevron.com/-/media/australia/publications/documents/gorgon-co2-injection-project.pdf>>.

<sup>39</sup> M. Hastings, 'Australia: Gorgon Gas Project – Ugly By Name', *Resilience* (Web Page, 11 April 2005) <<https://www.resilience.org/stories/2005-04-11/australia-gorgon-gas-project-8211-ugly-name/>>.

<sup>40</sup> Chevron, *Gorgon Project: An Australian Icon* (Web Page) <<https://australia.chevron.com/our-businesses/gorgon-project>>.

The other project in WA is the Collie-South West CO<sub>2</sub> Geosequestration Hub, which is led by the Department of Mines, Industry Regulation and Safety.<sup>41</sup> This project is undertaken by the electric power generators and users of coal in the industrial sector to capture and store CO<sub>2</sub> from these emitters in Kwinana and Collie.<sup>42</sup> It aims to capture CO<sub>2</sub> from the fossil fuel industry and power plants. These projects are connected by pipelines from the processing plant to the storage well sites. The Collie-South West project was completed in 2019 and the site has the capability of injecting at least 800,000 tonnes of CO<sub>2</sub> per year for 30 years.<sup>43</sup> The Australian Government supported the feasibility study of this project by providing \$32.1 million.<sup>44</sup>

Another upcoming project is the CarbonNet project in Gippsland, Victoria. This region contains large brown coal deposits that produce most of Victoria's electricity. This project, funded by the Australian and Victorian Governments, is projected to capture and store 1-5 million tonnes of CO<sub>2</sub> per year from industrial power plants or power stations.<sup>45</sup> The Australian Government supported the feasibility study of this project by providing \$95.2 million, which is forecasted to be completed in June 2020.<sup>46</sup>

Despite being slow, there has been considerable progress on CCS development in Australia in terms of research and regulatory development. CCS projects have Government support. However, all that the Government has supported is scientific investigations (i.e. feasibility studies). Development on CCS projects have been slow in Australia because the cost of doing CCS is high and requires a significant amount of capital.<sup>47</sup> However, in the recent

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<sup>41</sup> Government of Western Australia Department of Mines, Industry Regulation and Safety, *South West Hub Project* (Web Page) <<https://www.dmp.wa.gov.au/South-West-Hub-CCS-1489.aspx>>.

<sup>42</sup> Department of Resources, Energy and Tourism, Parliament of Australia, *Western Australia Greenhouse Gas Capture and Storage A Tale of Two Projects* (Report) 3 <[http://www.ccsassociation.org/index.php/download\\_file/view/536/98/](http://www.ccsassociation.org/index.php/download_file/view/536/98/)>.

<sup>43</sup> Western Australia, *Parliamentary Debates*, Legislative Assembly, 20 February 2019, 607 (W.J. Johnston, Minister of Mines and Petroleum) <[https://www.parliament.wa.gov.au/Hansard/hansard.nsf/0/077C03082908693D48258423000BC9DA/\\$File/A40%20S1%2020190220%20All.pdf](https://www.parliament.wa.gov.au/Hansard/hansard.nsf/0/077C03082908693D48258423000BC9DA/$File/A40%20S1%2020190220%20All.pdf)>.

<sup>44</sup> Australian Government Department of Industry, Innovation and Science, *Carbon Capture Storage Flagships* (Web Page, 28 February 2020) <<https://www.industry.gov.au/funding-and-incentives/carbon-capture-storage-flagships>>; Government of Western Australia Department of Mines, Industry Regulation and Safety, *South West Hub Project* (Web Page) <<https://www.dmp.wa.gov.au/South-West-Hub-CCS-1489.aspx>>.

<sup>45</sup> Department of Economic Development, Jobs, Transport and Resources, Parliament of Victoria, *The CarbonNet Project* (Environment Plan Summary Report, 16 January 2018) 1 <<https://www.nopsema.gov.au/assets/epdocuments/A590995.pdf>>.

<sup>46</sup> Australian Government Department of Industry, Innovation and Science, *Carbon Capture Storage Flagships* (Web Page, 28 February 2020) <<https://www.industry.gov.au/funding-and-incentives/carbon-capture-storage-flagships>>.

<sup>47</sup> Jonathan Paul Marshall, 'Disordering fantasies of coal and technology: Carbon capture and storage in Australia' (2016) 99 *Energy Policy* 288, 290.

Commonwealth Government Technology Investment Roadmap report, there are plans to get to an international cooperation agreement on low emissions technologies by the end of 2020 focusing on CCS, hydrogen, and renewable electricity trade.<sup>48</sup>

### 1.3.2 Carbon Capture and Storage Projects in Norway

Norway has been a pioneer in developing CCS technology, starting as early as 1990s, after the introduction of the *CO<sub>2</sub> Tax Act 1991*.<sup>49</sup> <sup>50</sup> CCS has been very successful in Norway. The oil and gas industry were the driving force of CCS in Norway, urging the Norwegian Government to undertake CCS with the aim of reducing CO<sub>2</sub> emissions. The Norwegian Government has also been actively funding for CCS development and playing a regulatory role over the years. This section will discuss the political evolution of CCS development in Norway.

In 1986, two researchers at the SINTEF Petroleum Research Centre came up with the idea to capture and store CO<sub>2</sub> in geological formations.<sup>51</sup> There was a linkage between the CCS research and injecting CO<sub>2</sub> for enhanced oil recovery.<sup>52</sup> The Air Pollution and Climate Secretariat (a body formed by four Swedish environmental organisations) argued that CCS was implemented in Norway with the view of reducing emissions and, at the same time, increasing the amount of oil that could be recovered from the reservoir by increasing the pressure in the oil fields.<sup>53</sup> The process of doing so is called Enhanced Oil Recovery (EOR). This is also one of the reasons as to why CCS was a preferred option in Norway.

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<sup>48</sup> Department of Industry, Science, Energy and Resources, Parliament of Australia, *Technology Investment Roadmap Discussion Paper: A Framework to Accelerate Low Emissions Technologies* (Report, May 2020) 4 <[https://consult.industry.gov.au/climate-change/technology-investment-roadmap/supporting\\_documents/technologyinvestmentroadmapdiscussionpaper.pdf](https://consult.industry.gov.au/climate-change/technology-investment-roadmap/supporting_documents/technologyinvestmentroadmapdiscussionpaper.pdf)>.

<sup>49</sup> This Act is also known as Act 21 December 1990 no. 72 relating to tax on discharge of CO<sub>2</sub> in the petroleum activities on the continental shelf.

<sup>50</sup> International Energy Agency, 'Energy Policies of EIA Countries: Norway 2017 Review' (Web Page) <<http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>> 87, archived at <<https://web.archive.org/web/20180919222931/http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>>.

<sup>51</sup> SINTEF, *1986: Mr. Carbon Capture & Storage* (Web Page, 8 March 2012) <<https://www.sintef.no/en/1986-mr-carbon-capture--storage/>>.

<sup>52</sup> A. Tjernshaugen, 'The growth of political support for CO<sub>2</sub> capture and storage in Norway' (2011) 20(2) *Environmental Politics* 227, 231.

<sup>53</sup> Air Pollution and Climate Series (AirClim), *Carbon Capture and Storage in Norway – The Moon Landing that Failed* (Report, Air Pollution and Climate Series 32, 2015) 10 <[https://www.airclim.org/sites/default/files/documents/APC32-CCS-in-Norway\\_0.pdf](https://www.airclim.org/sites/default/files/documents/APC32-CCS-in-Norway_0.pdf)>.

There are two large scale CCS projects in Norway, the Sleipner and the Snøwhit projects. The Sleipner site reached 20 years of safe CCS operations in 2016.<sup>54</sup> It is able to capture and store about 1 million tonnes of CO<sub>2</sub> a year from natural gas production.<sup>55</sup> As of June 2015, about 15.5 million tonnes of CO<sub>2</sub> have been injected into this site.<sup>56</sup> The Snøwhit project captures and stores more than 700,000 tonnes of CO<sub>2</sub> annually.<sup>57</sup> These two projects captures about 3-4% of Norway's GHGe annually.<sup>58</sup> Statistically, 21 million tonnes of CO<sub>2</sub> have been injected in these two projects in the past two decades, without any leakage observed.<sup>59</sup>

The Norwegian Government had the idea to develop CCS in the late 1980s when GHGe was a topical issue in Norway, as it had the political support to make a move. At that time, Prime Minister, Gro Harlem Brundtland was the chair of the World Commission on Environment and Development,<sup>60</sup> and she influenced the high level of importance placed on environmental issues. Norway was facing a climate policy dilemma due to the role played by Brundtland. This enabled CCS to be on the top of the national climate policy agenda<sup>61</sup> because it provided environmental benefits to meet the global emissions reduction target. Since that time, there has been continuous political support for Norway's investment in CCS. As a result, policies have been implemented fostering CCS technology development.

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<sup>54</sup> International Energy Agency, 'Energy Policies of EIA Countries: Norway 2017 Review' (Web Page) <<http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>> 87, 91, archived at <<https://web.archive.org/web/20180919222931/http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>>.

<sup>55</sup> Equinor, *Sleipner partnership releases CO<sub>2</sub> storage data* (Web Page, 12 June 2019) <<https://www.equinor.com/en/news/2019-06-12-sleipner-co2-storage-data.html>>.

<sup>56</sup> Carbon Capture & Sequestration Technologies, *Sleipner Fact sheet: Carbon Dioxide Capture and Storage Project* (Web Page) <<https://sequestration.mit.edu/tools/projects/sleipner.html>>. There are no recent figures available.

<sup>57</sup> ZeroCO<sub>2</sub>, Snøwhit (Web Page) <<http://www.zeroco2.no/projects/snoehvit>>.

<sup>58</sup>  $1.7 \text{ MtCO}_2\text{-e} \times 100 / 52 \text{ MtCO}_2\text{-e} = 3.27\%$ . Norway's GHGe in 2018 amounted to 52 MtCO<sub>2</sub>-e. The percentage calculated is a rough estimation as figures of total CO<sub>2</sub> captured from the two projects are not available as of 2020. Source: Statistics Norway, *Emissions to Air* (Web Page, 14 January 2020) <<https://www.ssb.no/en/klimagassn>>.

<sup>59</sup> International Energy Agency, 'Energy Policies of EIA Countries: Norway 2017 Review' (Web Page) <<http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>> 87, archived at <<https://web.archive.org/web/20180919222931/http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>>.

<sup>60</sup> United Nations Foundation, *Gro Harlem Brundtland (Norway)* (Web Page) <<https://unfoundation.org/who-we-are/our-board/gro-harlem-brundtland-norway-vice-chair/>>.

<sup>61</sup> A. Tjernshaugen, 'The growth of political support for CO<sub>2</sub> capture and storage in Norway' (2011) 20(2) *Environmental Politics* 227, 228.

In 1991, the Brundtland Government introduced a carbon tax, which was a driver of carbon sequestration development in Norway. This move triggered Statoil<sup>62</sup> to find other cost-effective options for reducing CO<sub>2</sub> emissions for their Sleipner gas field.<sup>63</sup> Statoil was more willing to invest in CCS as the amount they had to pay on carbon tax was similar to the cost of CCS.<sup>64</sup>

In 1994, three big companies, Statoil, Statkraft, and Norsk Hydro, joined together and established Naturkraft AS with the intention to build gas fired power stations.<sup>65</sup> They intended to co-operate on CCS. However, the Bondevik Government opposed this idea. The disagreement on building gas fired power stations created a major political conflict, which led to the downfall of Bondevik. The Stoltenberg Government supported gas production and had close relations with Statoil.<sup>66</sup> However, Stoltenberg preferred a cost-effective approach and did not push for gas production with CCS.<sup>67</sup> Subsequently, the Bondevik Government (in his second term as Prime Minister of Norway) supported production of natural gas only if the power plants had a CCS system installed.<sup>68</sup>

The Norwegian Government was interested in CCS because the country possesses large oil and gas reserves and the oil and gas industry is the backbone of the Norwegian economy.<sup>69</sup> As such, CCS policies were generally given high political support. Røttereng describes the Norwegian CCS as an instrument to ‘harmonize potential conflicting interests’ between the country’s economy from the oil and gas industry and the GHGe reduction commitments.<sup>70</sup>

The Norwegian Government prioritized CCS from natural gas combustion and used CCS as an instrument to continue its oil and gas production. CO<sub>2</sub> was captured from natural

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<sup>62</sup> Statoil is currently known as Equinor (Norway’s national oil and gas company).

<sup>63</sup> K. van Alphen et al, ‘The performance of the Norwegian carbon dioxide, capture and storage innovation system’ (2009) 37 *Energy Policy* 43, 46.

<sup>64</sup> J. Meadowcroft and O. Langhelle, *Caching the Carbon: The Politics and Policy of Carbon Capture and Storage* (Edward Elgar Publishing Limited, 2009) 106.

<sup>65</sup> H. E. Normann, ‘Policy networks in energy transitions: The cases of carbon capture and storage and offshore wind in Norway’ (2017) 118 *Technological Forecasting & Social Change* 80, 84.

<sup>66</sup> H. E. Normann, ‘Policy networks in energy transitions: The cases of carbon capture and storage and offshore wind in Norway’ (2017) 118 *Technological Forecasting & Social Change* 80, 85.

<sup>67</sup> H. E. Normann, ‘Policy networks in energy transitions: The cases of carbon capture and storage and offshore wind in Norway’ (2017) 118 *Technological Forecasting & Social Change* 80, 85.

<sup>68</sup> H. E. Normann, ‘Policy networks in energy transitions: The cases of carbon capture and storage and offshore wind in Norway’ (2017) 118 *Technological Forecasting & Social Change* 80, 85.

<sup>69</sup> A. Tjernshaugen, ‘The growth of political support for CO<sub>2</sub> capture and storage in Norway’ (2011) 20(2) *Environmental Politics* 227, 237.

<sup>70</sup> Jo-Kristian Straete Røttereng, ‘Carbon Capture and Storage in a Climate Policy Perspective: The Case of Norway’ (Master’s Thesis, Norwegian University of Science and Technology, June 2011) 75-76.



gas production in Norway and stored in the sub-seabed from 1996.<sup>71</sup> The Sleipner project started in 1996 and CO<sub>2</sub> emitted from the production of natural gas at the Sleipner field was separated and stored at the Utsira formation.<sup>72</sup> This was done to reduce the amount of carbon tax payable as the Norwegian carbon tax was very high. Meanwhile, the Snøhvit project started in 2008 where CO<sub>2</sub> was separated from the gas before the gas was converted into LNG and the CO<sub>2</sub> was transported by pipeline to the Snøhvit field to be injected into the sub-seabed.<sup>73</sup>

Besides the Sleipner and Snøhvit projects, Norway also has other CCS projects. The Norcem project captures CO<sub>2</sub> from a cement factory.<sup>74</sup> This project captures approximately 400,000 tonnes of CO<sub>2</sub> a year.<sup>75</sup> The Fortume Oslo Varme project captures about 400,000 tonnes of CO<sub>2</sub> a year from a waste-to-energy plant in Oslo.<sup>76</sup> The Northern Lights project plans to develop an infrastructure for CO<sub>2</sub> transport and storage. This project forms part of the Norwegian full-scale project and aims to be completed in 2024.<sup>77</sup>

A simple comparison of established and operating CCS projects shows that Norway has developed CCS more than Australia. The Norwegian Government has extensively funded the research and development of CCS. It established the CO<sub>2</sub> Technology Centre Mongstad in 2012, which is an advanced center for CCS technologies - the largest in the world.<sup>78</sup> The Norwegian Government has also been extensively funding CCS research through the CLIMIT programme, a national programme set up for research and development of CCS technologies.<sup>79</sup> This program is administered by Gassnova, a company owned by the Ministry of Petroleum and Energy. In 2008, Gassnova was established by the Norwegian Government to ensure the implementation and development of CCS in Norway.<sup>80</sup> Gassnova advises the

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<sup>71</sup> Norwegian Petroleum, *Carbon Capture and Storage* (Web Page) <<https://www.norskipetroleum.no/en/environment-and-technology/carbon-capture-and-storage/>>.

<sup>72</sup> Norwegian Petroleum, *Carbon Capture and Storage* (Web Page) <<https://www.norskipetroleum.no/en/environment-and-technology/carbon-capture-and-storage/>>.

<sup>73</sup> Norwegian Petroleum, *Carbon Capture and Storage* (Web Page) <<https://www.norskipetroleum.no/en/environment-and-technology/carbon-capture-and-storage/>>.

<sup>74</sup> CCS Norway, *Capture: Norcem* (Web Page) <<https://ccsnorway.com/capture-norcem/>>.

<sup>75</sup> Norcem, *Carbon Capture and Storage (CCS)* (Web Page) <<https://www.norcem.no/en/CCS>>.

<sup>76</sup> CCS Norway, *Capture: Fortum Oslo Varme* (Web Page) <<https://ccsnorway.com/capture-fortum-oslo-varme/>>.

<sup>77</sup> Northern Lights Project, *About The Project* (Web Page) <<https://northernlightsccs.com/en/about>>.

<sup>78</sup> C. Bergsli, 'The Future of CCS in Norway', *World Coal Association* (Web Page, 9 June 2017) <<https://www.worldcoal.org/future-ccs-norway>>.

<sup>79</sup> Norwegian Petroleum, *Carbon Capture and Storage* (Web Page) <<https://www.norskipetroleum.no/en/environment-and-technology/carbon-capture-and-storage/>>.

<sup>80</sup> International Energy Agency, *Energy Policies of EIA Countries, Norway 2017 Review* (Web Page) <<http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>> 88, archived at

Ministry on matters relating to CCS; its main aim is to reduce the cost of CCS. Extensive government funding and development of CCS shows Norway's commitment to reducing GHGe and may explain the relative success in establishing operating CCS projects. However, as argued above, the carbon tax was also a direct incentive for petroleum companies to invest in CCS.

## **2.0 Barriers and Incentives for Implementing Carbon Capture and Storage**

The barriers to the development of CCS in Australia and Norway are: (1) technological (including storage security); (2) financial; and (3) political. Section 2.3 discusses the political barrier which links to the lack of comprehensive policy measures and a regulatory framework. It then highlights the effect of other mitigation instruments such as a carbon tax and emissions trading scheme (ETS) on CCS development. Section 2.4 addresses the environmental concerns on CCS development faced by Australia and Norway. Both countries have confronted the same challenges; Norway seems to have moved more quickly on CCS than Australia.

### *2.1 Technological Barrier*

As the CCS system is complex, it requires advanced technology and expertise. It is at a developing phase throughout the world as extensive research is being conducted to improve the CCS system. CCS technology is also costly and involves high capital. The issue of cost is addressed in the next section on financial barrier.

Storage security is another barrier towards CCS development which requires advanced technology. Over time, there is increased residual CO<sub>2</sub> trapping which can create a problem leading to leakage.<sup>81</sup> Leakage is a potential problem that worries many groups of people (environmentalists). Therefore, it is very important to find an appropriate site for storage.

### *2.2 Financial Barrier*

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<<https://web.archive.org/web/20180919222931/http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>>.

<sup>81</sup> F. Karimi et al, 'CCS potential in Norway – Exploring the role of flagship projects: The Mongstad and Kårstø case studies' (2012) 4(1) *International Journal of Sustainable Water and Environmental Systems* 23, 24.

The cost of starting a CCS project is very high; initial investment requires a huge amount of capital. There would always be a high and bespoke cost to the technology. Also, the development of infrastructure to transport CO<sub>2</sub> to the storage sites such as pipelines involves high cost. The cost will only reduce when there are more projects carried out, which has also been true of the development of renewable energy (RE). Initially when RE was introduced, it was very expensive but, as uptake increased, the cost became lower. Support from Government to overcome the huge initial investment costs has been important for RE and is essential for funding the growth of CCS technology.

Tax earned from oil and gas activities can be used to fund CCS technology. This thesis will not provide an exhaustive review of the taxation system in both countries as it is beyond the scope of the thesis. The taxation regimes in Australia and Norway adopt a similar concept where companies are only required to pay tax when they make profit. The Petroleum Resource Rent Tax in Australia is a Commonwealth tax imposed on an entity's profits from a petroleum project at a rate of 40%.<sup>82</sup> This tax applies to upstream profits. The onshore oil and gas is subjected to State royalties (varies between 10% and 12.5%).<sup>83</sup> In Norway, the company's net profit is taxable at 22%.<sup>84</sup> Besides the ordinary company tax rate, petroleum companies in Norway are also subjected to a special tax at 56%,<sup>85</sup> leaving a marginal tax rate of 76%.<sup>86</sup>

There has been funding towards research and development of CCS in Australia. As a result, the Cooperative Research Centre for Greenhouse Gas Technologies (CO<sub>2</sub>CRC) was set up to conduct research on CCS, funded by the Australian Government. The Government has acknowledged the ability of CCS to reduce GHGe and encourages more projects to be carried out as the Australian economy is heavily dependent on fossil fuels generating high CO<sub>2</sub> emissions. How much the Government is willing to invest on CCS technology is unclear, despite plans to enter into an international cooperation agreement focusing on low emissions technologies such as CCS.<sup>87</sup> This is due to the lack of political will to make companies invest

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<sup>82</sup> Australian Government Australian Taxation Office, *PRRT Concepts* (Web Page) <<https://www.ato.gov.au/Business/Petroleum-resource-rent-tax/PRRT-concepts/>>.

<sup>83</sup> 'Oil and Gas Taxation in Australia: Deloitte Taxation and Investment Guides', *Deloitte* (Web Page) 6 <<https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Energy-and-Resources/gx-er-oilandgas-australia.pdf>>.

<sup>84</sup> Norwegian Petroleum, *The Petroleum Tax System* (Web Page, 7 October 2019) <<https://www.norskpetroleum.no/en/economy/petroleum-tax/>>.

<sup>85</sup> *Petroleum Taxation Act 1975* (Norway) s 5, Act of 13 June 1975 No. 35 relating to the Taxation of Subsea Petroleum Deposits. Last amended by Act of 21 June 2013 No. 66.

<sup>86</sup> Norwegian Petroleum, *The Petroleum Tax System* (Web Page, 7 October 2019) <<https://www.norskpetroleum.no/en/economy/petroleum-tax/>>.

<sup>87</sup> Department of Industry, Science, Energy and Resources, Parliament of Australia, *Technology Investment Roadmap Discussion Paper: A Framework to Accelerate Low Emissions Technologies*

in CCS. In comparison, Norway has been able to stimulate CCS investment because of carbon pricing. It is more expensive to emit in Norway; CCS was used as a mechanism to reduce GHGe.

### *2.3 Political Barrier and the Effect of Other Mitigation Instruments on Carbon Capture and Storage Development*

The lack of comprehensive policy measures and regulatory framework to encourage the deployment of CCS is also a barrier in Australia. This is largely a political will which creates uncertainty among stakeholders and complication in projects. Ten years ago, the gas industry was calling for a price on carbon thinking that it would give them a comparative advantage over the coal industry. However, since the repeal of the *Clean Energy Act 2011* (Cth), there has been a boom in the gas industry leaving the industry at an advantage to exploit the lack of emissions regulation. The Gorgon project had a specific project-based legislation which only applies to the said project. This leaves a gap and uncertainty in the CCS regulatory framework.

Mitigation instruments such as a carbon tax and ETS have influenced the development of CCS. These instruments provided incentives for emitters and promoted the uptake of CCS. It encouraged the deployment of CCS projects aiming to reduce GHGe. These CCS and ETS incentives only apply at the point of capture in the CCS process;<sup>88</sup> the financial liability imposed at that point has been enough to drive the investment in CCS.

Under a carbon tax, emitters must pay for each tonne of CO<sub>2</sub> emitted into the atmosphere. This increases the cost for emitters to emit. As a result, emitters use CCS as a method to avoid paying the carbon tax. This situation is evident in Norway through the biggest CCS projects, Sleipner and Snøhvit, and other CCS projects, where the oil and gas operators are exempted from paying the Norwegian carbon tax for the amounts of CO<sub>2</sub> captured and stored into the sub-seabed.<sup>89</sup>

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(Report, May 2020) 4 <[https://consult.industry.gov.au/climate-change/technology-investment-roadmap/supporting\\_documents/technologyinvestmentroadmapdiscussionpaper.pdf](https://consult.industry.gov.au/climate-change/technology-investment-roadmap/supporting_documents/technologyinvestmentroadmapdiscussionpaper.pdf)>.

<sup>88</sup> International Energy Agency, *Carbon Capture and Storage Model Regulatory Framework* (Report, November 2010) 37 <<https://www.oecd-ilibrary.org/docserver/5km4q8rj3hxs-en.pdf?expires=1583831045&id=id&accname=guest&checksum=290CFC1A997BBEA12368A7094E7F7D75>>.

<sup>89</sup> International Energy Agency, *Carbon Capture and Storage Model Regulatory Framework* (Report, November 2010) 36 <<https://www.oecd-ilibrary.org/docserver/5km4q8rj3hxs-en.pdf?expires=1583831045&id=id&accname=guest&checksum=290CFC1A997BBEA12368A7094E7F7D75>>.

Besides the carbon tax, the ETS has also had an effect on CCS. Under a cap and trade ETS, emitters must surrender an emissions permit for every tonne of CO<sub>2</sub> emitted. By using CCS, the emitters would not have to surrender emissions permits for the amount of CO<sub>2</sub> that they have captured and stored.<sup>90</sup> This is acknowledged by the European Union (EU) ETS in the Preamble (paragraphs 18-20) of *Directive 2009/29/EC*.<sup>91</sup> In Phase III (2013-2020) the current phase of the EU ETS onwards, CCS is fully included as a mechanism to reduce GHGe.<sup>92</sup> This is an incentive to emitters as they would have to purchase fewer emissions permits from the market.

These instruments will only have an effect on CCS when it becomes more developed and cost-effective. If the CCS technology is too expensive, then emitters would continue to emit and will prefer to pay the tax or buy extra emissions permits under the cap and trade ETS. Therefore, the deployment of more CCS projects will depend on the cost. As Norway's petroleum industry is subjected to 'double regulation' (carbon tax and ETS), it is more expensive to pollute, and companies find CCS a better solution. In comparison, Australia does not have a carbon tax or an ETS to encourage CCS investment.

There are a few reasons as to why Norwegian policy makers are interested in CCS.<sup>93</sup> Firstly, there have been conflicts between the climate and energy policy targets, which led to interest in CCS to overcome these conflicts.<sup>94</sup> The rising emissions from the oil and gas industry also contributed to it, building pressure to act on environmental protection.

Secondly, in the 1990s, there were controversies about the introduction of gas-fired power plants.<sup>95</sup> The Bondevik Government initially opposed building gas-fired power stations but later agreed on doing so with CCS. However, the Stoltenberg Government was a strong

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<sup>90</sup> International Energy Agency, *Carbon Capture and Storage Model Regulatory Framework* (Report, November 2010) 36 <<https://www.oecd-ilibrary.org/docserver/5km4q8rj3hxs-en.pdf?expires=1583831045&id=id&accname=guest&checksum=290CFC1A997BBEA12368A7094E7F7D75>>.

<sup>91</sup> *Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community [2009] OJ L 140/63 ('Directive 2009/29/EC)*.

<sup>92</sup> Preamble (paragraph 39) of *Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community [2009] OJ L 140/63 ('Directive 2009/29/EC)*.

<sup>93</sup> J. Meadowcroft and O. Langhelle, *Caching the Carbon: The Politics and Policy of Carbon Capture and Storage* (Edward Elgar Publishing Limited, 2009) 98-99.

<sup>94</sup> J. Meadowcroft and O. Langhelle, *Caching the Carbon: The Politics and Policy of Carbon Capture and Storage* (Edward Elgar Publishing Limited, 2009) 98-99.

<sup>95</sup> J. Meadowcroft and O. Langhelle, *Caching the Carbon: The Politics and Policy of Carbon Capture and Storage* (Edward Elgar Publishing Limited, 2009) 98-99.

advocate of gas and promoted CCS development. To strike a compromise, the plan to build gas-fired power plants with CCS was agreed upon.

Third, there was immense pressure on the regulatory environment (i.e. to develop a legal framework on reducing GHGe) which pushed for CCS.<sup>96</sup> This is evident with the Sleipner project development, which resulted from the introduction of the CO<sub>2</sub> tax on the oil and gas industry. Fourth, environmental activist groups, such as Bellona, promoted CCS to reach a compromise between the climate and energy controversies.<sup>97</sup> Environmentalists used Norway's political situation on CCS as a move to push CCS development.<sup>98</sup> These reasons shaped the development of CCS in Norway.

The carbon tax and ETS provide financial incentives in Norway. Australia, on the other hand, does not possess those mechanisms, but can use offsets from biosequestration projects. Australia can use offsets generated from forestations projects as a form of biosequestration. Besides forestation, Australia also has coastal wetlands ('blue carbon' ecosystems) such as mangroves.<sup>99</sup> Scientists note that 'blue carbon' ecosystems stores carbon faster than forests;<sup>100</sup> Australia has better temperature due to its geographical situation, compared to Norway. As such, geosequestration projects are more feasible in Norway. Biosequestration projects will not be discussed in more detail as it is beyond the scope of this thesis.

#### *2.4 Environmental Concerns on Carbon Capture and Storage Development*

Concerns with respect to CCS relate to the impacts on the environment. These can occur by accidentally releasing CO<sub>2</sub> or the impact created by large-scale leakage of CO<sub>2</sub> into the atmosphere.<sup>101</sup> There are fears of leakage and the difficulty of monitoring those leaks as most storage sites are offshore, which could increase the chances of earthquakes, produce

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<sup>96</sup> J. Meadowcroft and O. Langhelle, *Caching the Carbon: The Politics and Policy of Carbon Capture and Storage* (Edward Elgar Publishing Limited, 2009) 98-99.

<sup>97</sup> J. Meadowcroft and O. Langhelle, *Caching the Carbon: The Politics and Policy of Carbon Capture and Storage* (Edward Elgar Publishing Limited, 2009) 98-99.

<sup>98</sup> J. Meadowcroft and O. Langhelle, *Caching the Carbon: The Politics and Policy of Carbon Capture and Storage* (Edward Elgar Publishing Limited, 2009) 111.

<sup>99</sup> Australian Government Department of Agriculture, Water and the Environment, *Wetlands Australia 31: Australian Government Initiatives for Blue Carbon* (Web Page) <<http://www.environment.gov.au/water/wetlands/publications/wetlands-australia/national-wetlands-update-february-2019/govt-initiatives-blue-carbon>>.

<sup>100</sup> Joanna Khan, 'Threatened Blue Carbon Ecosystems Store Carbon 40 Times Faster than Forests', *ABC News* (Web Page, 26 March 2018) <<https://www.abc.net.au/news/science/2018-03-26/blue-carbon-mangroves-seagrass-fight-climate-change/9564096>>.

<sup>101</sup> J. Meadowcroft and O. Langhelle, *Caching the Carbon: The Politics and Policy of Carbon Capture and Storage* (Edward Elgar Publishing Limited, 2009) 4.

fatalities, and may contaminate underground water supplies.<sup>102</sup> This is hindering its development. The environmental concerns are prevalent in both countries.

### **3.0 Carbon Capture and Storage Regulation in Australia and Norway**

Regulatory frameworks are necessary to ensure the safety of CCS projects, the environment, and the protection of human health, whilst at the same time reducing emissions.<sup>103</sup> In response, Governments around the world have started to amend their regulatory frameworks to address CCS and to incorporate CCS projects into the approved measures for reducing GHGe.

This thesis focuses on: (a) the assessment and approval process of licensing and permits which needs to be obtained for the operation of capturing, transporting, and storing; (b) liabilities and responsibilities (in the event accidents and leakage happens); and (c) ownership (who owns the greenhouse substance injected until the ground). Each country has its own regulatory framework to deal with these issues. The next sections assess whether Australia and Norway have comprehensive legislation and policies on CCS.

#### *3.1 Legal Development of Carbon Capture and Storage in Australia*

Over more than a decade, the Commonwealth Government and State Governments in Australia have developed comprehensive CCS legislation which covers both offshore and onshore CCS. Section 3.1.1 provides a brief overview of the Commonwealth laws on CCS and section 3.1.2 on Australian State laws on CCS. This thesis will focus on three key elements of the legal frameworks on CCS: (a) assessments and approvals (to permit CCS activities); (b) liabilities and responsibilities; and (c) ownership (who owns the greenhouse substance injected into the ground). It will not provide an exhaustive review of the legal framework. The Commonwealth and State laws contain differences on the key elements. To increase CCS development in Australia, there has to be a unified and consistent approach in the relevant laws across the country. The easiest way Australia can do this is by adopting the

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<sup>102</sup> J. P. Marshall, 'Disordering fantasies of coal and technology: Carbon capture and storage in Australia' (2016) 99 *Energy Policy* 288, 289-290.

<sup>103</sup> International Energy Agency, *Carbon Capture and Storage Model Regulatory Framework* (Report, November 2010) 25 <<https://www.oecd-ilibrary.org/docserver/5km4q8rj3hxs-en.pdf?expires=1583831045&id=id&accname=guest&checksum=290CFC1A997BBEA12368A7094E7F7D75>>.

legal framework of the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) (*OPGGSA 2006*) on the key elements.

### *3.1.1 Commonwealth Laws (Federal level) on Carbon Capture and Storage*

The *Offshore Petroleum Act 2006* (Cth) was amended to implement a framework including greenhouse gas storage provisions. The current federal legislation is the *OPGGSA 2006* and *Greenhouse Gas Storage (Resource Management and Administration) Regulations 2011* (Cth), which incorporate a licensing framework for CO<sub>2</sub>. This legislation provides a regulatory framework for ‘the injection and storage of greenhouse gas substances’ in offshore areas.<sup>104</sup> <sup>105</sup> It also provides a regulatory structure for CCS regulating pipeline transportation, injection and storage activities offshore. The *OPGGSA 2006* was enacted to regulate offshore CCS activities which fell within Commonwealth waters, extending more than three nautical miles. The State has control and remains responsible for up to the three nautical miles limit. The key elements of the *OPGGSA 2006* are discussed below.

#### *3.1.1(a) Assessment and Approvals*

Under the *OPGGSA 2006*, an operator must obtain a greenhouse gas permit before carrying activities associated with CCS. This permit gives the rights to explore, inject, and store any greenhouse gas as stated in the greenhouse gas assessment permit.<sup>106</sup> There are certain conditions to be fulfilled in order to obtain this permit.<sup>107</sup> The Commonwealth Minister decides on the approval of the permit.<sup>108</sup>

Once the permittee (operator) has obtained an assessment permit, and a suitable storage formation is identified, the permittee has to apply for a greenhouse gas holding lease.<sup>109</sup> This will allow the applicant who is not in a position to inject or store any greenhouse

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<sup>104</sup> According to *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) s 4, an offshore area means that it ‘(a) starts 3 nautical miles from the baseline from which the breadth of the territorial sea is measured; and (b) extends seaward to the outer limits of the continental shelf.’

<sup>105</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) s 3(b).

<sup>106</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) s 290.

<sup>107</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) s 291.

<sup>108</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) s 291.

<sup>109</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) s 324.



gas substance, but will eventually be in such a position within 15 years, to 'hold' an area until injection and storage operations commence.<sup>110</sup>

In order to carry out injection and storage activities, the permittee must apply for a greenhouse gas injection licence.<sup>111</sup> This licence allows the licensee to inject and permanently store greenhouse gas into 'one or more identified greenhouse gas storage formations' which are situated within the permit or lease area.<sup>112</sup> The licence is only granted after being declared by the Minister.<sup>113</sup> It is an offence to inject and store greenhouse gas without a greenhouse gas injection licence.<sup>114</sup>

The licensee bears statutory liabilities until a site closing certificate is obtained. Once all injection operations have ceased, the licensee must apply for a site closing certificate.<sup>115</sup> The Commonwealth Minister decides on the site closing certificate after considering several issues. Once the site closing certificate is issued and the Minister is satisfied that at least 15 years have passed to declare a 'closure assurance period', declaring that it has come to an end.<sup>116</sup> The Minister will declare a 'closure assurance period' when the Minister is satisfied that there are no significant risks and there is no further injection into the formation.<sup>117</sup> After this process is completed, liability is transferred to the Commonwealth Government.

### *3.1.1(b) Liabilities and Responsibilities*

The *OPGGSA 2006* laid down long-term liability provisions on who is responsible for the storage site before and after the closure phase (either the operator or the Commonwealth Government). The operator may transfer liability of the storage site to the Commonwealth Government once a site closing certificate is in force and there is a successful completion of a 'closure assurance period'.<sup>118</sup> The Commonwealth Government must indemnify the 'person'<sup>119</sup> against liability.<sup>120</sup>

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<sup>110</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) s 318.

<sup>111</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) s 361.

<sup>112</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) s 361, 355.

<sup>113</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) s 292.

<sup>114</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) s 355.

<sup>115</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) s 386.

<sup>116</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) s 399.

<sup>117</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) s 399.

<sup>118</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) s 400.

<sup>119</sup> The *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) does not provide a definition of 'person'. This could mean the operator.

<sup>120</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) s 400(2).

The licence holder (operator) bears primary liability for the risks involved in carrying out the injection and storage activities (i.e. leakages, accidents). The Commonwealth Government will indemnify the licence holder for any liability of the registered holder of the licence: (i) in damages, (ii) act done or omitted to be done in carrying out operations as authorised by the licence; and (iii) incurred after the end of the 'closure assurance period'.<sup>121</sup> The Commonwealth Government also assumes long-term liability even if the licensee has ceased to exist.<sup>122</sup>

### *3.1.1(c) Ownership*

The *OPGGSA 2006* is silent on the issue of ownership of any greenhouse gas substance injected into the underground geological formation.

### *3.1.2 State Laws on Carbon Capture and Storage*

Currently, four States (Victoria, Queensland, South Australia (SA), and WA) have enacted CCS legislation. This section will focus on three key elements of each States legal framework on CCS: (a) assessments and approvals (of permits, lease, and licences for injection and storage activities); (b) liability (when accidents or leakages happen); and (c) ownership (who owns the greenhouse substance injected into the ground).

Victoria was one of the first States to enact CCS legislation, the *Greenhouse Gas Geological Sequestration Act 2008* (Vic) (*GGGSA 2008*) which provides for an onshore regulatory framework. The offshore regulatory framework is called *Offshore Petroleum and Greenhouse Gas Storage Act 2010* (Vic) (*OPGGSA 2010*). This Act works similarly with the *OPGGSA 2006* 'to avoid regulatory and policy problems.'<sup>123</sup> Queensland only has an onshore regulatory framework, the *Greenhouse Gas Storage Act 2009* (Qld) (*GGSA 2009*). This Act is supported by the *Greenhouse Gas Storage Regulations 2010* (Qld). SA's regulatory framework on CCS is the *Petroleum and Geothermal Energy Act 2000* (SA) (*PGEA 2000*).

WA does not have a specific regulatory framework on CCS, unlike the other States discussed above. Instead, the WA Government adopted a project specific legislation to deal with the Gorgon project. The current legislation is the *Barrow Island Act 2003* (WA) (*BIA 2003*)

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<sup>121</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) s 400(1)(d).

<sup>122</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (Cth) s 401.

<sup>123</sup> T. Dixon, Sean T. McCoy and Ian Havercroft, 'Legal and Regulatory Developments on CCS' (2015) 40 *International Journal of Greenhouse Gas Control* 431, 440.

which regulates and permits CO<sub>2</sub> storage and authorises an agreement between the State and the Gorgon joint ventures.<sup>124</sup>

### *3.1.2(a) Assessment and Approvals*

Both the Victorian offshore and onshore legislation are similar on the assessment and approval process. The operator has to obtain a greenhouse gas assessment permit<sup>125</sup> under the offshore legislation and an exploration permit<sup>126</sup> under the onshore legislation before carrying out activities associated with CCS. The operator has to obtain a greenhouse gas assessment permit which authorises the permittee to explore, inject and store any greenhouse gas as stated in the permit.<sup>127</sup> It is an offence to explore without a permit.<sup>128</sup> The Minister also decides on whether or not to grant the GHG assessment permit<sup>129</sup> or the exploration permit.<sup>130</sup>

After obtaining a greenhouse gas assessment permit, the applicant can apply for a greenhouse gas holding lease<sup>131</sup> to explore for potential greenhouse gas storage formations and injection sites in the lease area.<sup>132</sup> Under the onshore legislation, once a greenhouse gas exploration permit has been obtained, the applicant can apply for a greenhouse sequestration formation lease which allows the holder of an exploration permit to retain their rights to inject and store greenhouse gas substance that is not commercially viable yet but might be viable within 15 years.<sup>133</sup>

Both pieces of Victorian legislation require a licence to be obtained. Under the offshore legislation, the licensee would also need to obtain a greenhouse gas injection licence to inject and store greenhouse gas in the licence area.<sup>134</sup> Failure to do so is an offence.<sup>135</sup> The Minister decides on granting the greenhouse gas injection licences.<sup>136</sup> Based on the Victorian onshore

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<sup>124</sup> The Gorgon Gas Processing and Infrastructure Project Agreement is included in *Barrow Island Act 2003* sch 1.

<sup>125</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2010* (Vic) s 286.

<sup>126</sup> *Greenhouse Gas Geological Sequestration Act 2008* (Vic) s 19.

<sup>127</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2010* (Vic) s 286.

<sup>128</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2010* (Vic) s 284(2).

<sup>129</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2010* (Vic) s 287.

<sup>130</sup> *Greenhouse Gas Geological Sequestration Act 2008* (Vic) s 25.

<sup>131</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2010* (Vic) s 324.

<sup>132</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2010* (Vic) s 324(3) and (4).

<sup>133</sup> *Greenhouse Gas Geological Sequestration Act 2008* (Vic) s 58 and 59.

<sup>134</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2010* (Vic) s 370.

<sup>135</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2010* (Vic) s 370.

<sup>136</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2010* (Vic) s 373.

legislation, the licence allows the licensee to carry out greenhouse gas injection activities.<sup>137</sup> The licence can be applied by a holder of an exploration permit or retention lease.<sup>138</sup>

Similar to the *OPGGSA 2006*, once all injection operations have ceased under the Victorian offshore legislation, the licensee can apply for a site closing certificate.<sup>139</sup> The Minister will assess it and, once the Minister is satisfied that injection operations have ceased, the Minister will issue a written notice known as the pre-certificate notice.<sup>140</sup> The *OPGGSA 2010* (Vic) does not have a 'closure assurance period' like the *OPGGSA 2006*. In order to surrender the injection and monitoring license under the Victorian onshore legislation,<sup>141</sup> the licence holder must 'pay the remaining cost of carrying out long-term monitoring and verification as detailed in the long-term monitoring and verification plan'.<sup>142</sup> The *GGSA 2008* (Vic) does not provide a site closing certificate.

In Queensland, under the *GGSA 2009* (Qld), there are three types of authority: (1) a greenhouse gas exploration permit; (2) a greenhouse gas injection and storage lease; and (3) a greenhouse gas injection and storage data acquisition authority.<sup>143</sup> This Act provides a system of granting greenhouse gas exploration permits,<sup>144</sup> and greenhouse gas injection and storage leases,<sup>145</sup> which regulate the injection and storage activities. The system for obtaining these titles are different compared to the Commonwealth legislation and other State legislation.

A greenhouse gas permit holder is allowed to conduct greenhouse gas storage activities, evaluate the feasibility of greenhouse gas stream storage, and plug and abandon a well in the permitted area.<sup>146</sup> The Minister decides on granting the GHG permits<sup>147</sup> and the greenhouse gas lease.<sup>148</sup> The Queensland Act differs slightly from the other Acts as it defines the injected substance known as a greenhouse gas stream ('GHG stream') as a 'stream of carbon dioxide or a substance that overwhelmingly consists of carbon dioxide'.<sup>149</sup>

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<sup>137</sup> *Greenhouse Gas Geological Sequestration Act 2008* (Vic) s 71.

<sup>138</sup> *Greenhouse Gas Geological Sequestration Act 2008* (Vic) s 72.

<sup>139</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2010* (Vic) s 414 and 420.

<sup>140</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2010* (Vic) s 420 and 421.

<sup>141</sup> *Greenhouse Gas Geological Sequestration Act 2008* (Vic) s 171.

<sup>142</sup> *Greenhouse Gas Geological Sequestration Act 2008* (Vic) s 174(1).

<sup>143</sup> *Greenhouse Gas Storage Act 2009* (Qld) s 18.

<sup>144</sup> *Greenhouse Gas Storage Act 2009* (Qld) s 40.

<sup>145</sup> *Greenhouse Gas Storage Act 2009* (Qld) s 117 and 130.

<sup>146</sup> *Greenhouse Gas Storage Act 2009* (Qld) s 30.

<sup>147</sup> *Greenhouse Gas Storage Act 2009* (Qld) s 40.

<sup>148</sup> *Greenhouse Gas Storage Act 2009* (Qld) s 130.

<sup>149</sup> *Greenhouse Gas Storage Act 2009* (Qld) s 12(1).

The *GGSA 2009* (Qld) does not have a site closing certificate like the *OPGGSA 2006*. A lease holder may surrender the lease only after an application has been made and the surrender has been approved.<sup>150</sup> The lease holder cannot surrender part of the lease area.<sup>151</sup> The surrender requires the approval of the Minister after considering the relevant factors.<sup>152</sup> The Minister will approve it when he or she is satisfied that all injection activities have concluded, and the wells have been fully de-commissioned.

Meanwhile, in SA, the *PGEA 2000* (SA) was amended in 2009 to include the licenses for injection activities and storage.<sup>153</sup> This Act provides a system for granting an exploration license,<sup>154</sup> retention license,<sup>155</sup> and production licenses.<sup>156</sup> The *PGEA 2000* (SA) does not have a site closing certificate like the *OPGGSA 2006*. A licensee may apply to the Minister under the Act to surrender the license or part of the license area.<sup>157</sup> The Minister decides on the approval of the surrendering of the license.<sup>158</sup>

The assessment and approval process differ in WA because the State Government adopted a 'project-specific legislation' specifically to support the Gorgon project.<sup>159</sup> The *BIA 2003* (WA) explicitly states that it ratifies the agreement between the State and the Gorgon joint venturers to 'undertake offshore production of natural gas and other petroleum and a gas processing and infrastructure project on Barrow Island.' The environmental impact assessment was carried out by the Western Australian Environmental Protection Authority.

### *3.1.2(b) Liabilities and Responsibilities*

Both the Victorian offshore and onshore legislation, and the *GGSA 2009* (Qld), are silent on the transfer of liabilities to the State, and does not provide any indemnities for long-term liability, unlike the *OPGGSA 2006*. The operator can still be liable even after the title is surrendered. The *PGEA 2000* (SA) is also silent on the issue of liability. The licensee bears responsibility during the storage phase. This will transfer to the State when the licence is surrendered.

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<sup>150</sup> *Greenhouse Gas Storage Act 2009* (Qld) s 174.

<sup>151</sup> *Greenhouse Gas Storage Act 2009* (Qld) s 175.

<sup>152</sup> *Greenhouse Gas Storage Act 2009* (Qld) s 179.

<sup>153</sup> *Petroleum and Geothermal Energy Act 2000* (SA) s 10.

<sup>154</sup> *Petroleum and Geothermal Energy Act 2000* (SA) s 21-27.

<sup>155</sup> *Petroleum and Geothermal Energy Act 2000* (SA) s 28-33.

<sup>156</sup> *Petroleum and Geothermal Energy Act 2000* (SA) s 34-42.

<sup>157</sup> *Petroleum and Geothermal Energy Act 2000* (SA) s 89(1).

<sup>158</sup> *Petroleum and Geothermal Energy Act 2000* (SA) s 89.

<sup>159</sup> T. Dixon, Sean T. McCoy and Ian Havercroft, 'Legal and Regulatory Developments on CCS' (2015) 40 *International Journal of Greenhouse Gas Control* 431, 440.

As for WA, the *BIA 2003 (WA)* does not specifically provide the transfer of liability from the operators. It also does not mention about State liability after the Gorgon project ceases to exist. This is possibly because the WA State Government is providing the indemnity to operators. The State will indemnify the joint venturers for their:

common law liability to independent third parties arising after the liability assumption date for loss or damage caused by the injection of Gorgon CO<sub>2</sub> in the formation where that loss or damage is attributable to an act done, or omitted to be done, in the carrying out of CO<sub>2</sub> injection operations under the authority of the Section 13 approval.<sup>160</sup>

### *3.1.2(c) Ownership*

The Victorian offshore and onshore legislation states that the Crown is the owner of all the underground geological storage formation,<sup>161</sup> with the Crown retaining land rights.<sup>162</sup> Once a greenhouse gas injection license is surrendered or cancelled, the Crown becomes the owner of the greenhouse gas substance injected into the geological formation under that license.<sup>163</sup> The position is the same in SA, where the Crown vests ownership in petroleum and other regulated sources.<sup>164</sup>

Like the Victorian Acts, Queensland vests ownership on all greenhouse gas storage reservoirs.<sup>165</sup> The State also vest ownership in the injected 'GHG stream' after the greenhouse gas lease is surrendered or ends.<sup>166</sup> However, in WA, the *BIA 2003 (WA)* is silent on the issue of ownership.

### *3.2 Legal Development of Carbon Capture and Storage in Norway*

Over the years, the Norwegian Parliament has developed comprehensive CCS legislation. This includes the following legislation: (a) *Regulations to Act relating to petroleum activities 1997*;<sup>167</sup> (b) *Regulations relating to exploitation of subsea reservoirs on the*

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<sup>160</sup> *Barrow Island Act 2003 (WA)* s 14(D).

<sup>161</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2010 (Vic)* s 65; *Greenhouse Gas Geological Sequestration Act 2008 (Vic)* s 14.

<sup>162</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2010 (Vic)* s 66; *Greenhouse Gas Geological Sequestration Act 2008 (Vic)* s 15.

<sup>163</sup> *Offshore Petroleum and Greenhouse Gas Storage Act 2010 (Vic)* s 67; *Greenhouse Gas Geological Sequestration Act 2008 (Vic)* s 16.

<sup>164</sup> *Petroleum and Geothermal Energy Act 2000 (SA)* s 5(1).

<sup>165</sup> *Greenhouse Gas Storage Act 2009 (Qld)* s 27.

<sup>166</sup> *Greenhouse Gas Storage Act 2009 (Qld)* s 181.

<sup>167</sup> These Regulations were laid down by a 'Royal Decree on 27 June 1997 pursuant to Act 29 November 1996 no. 72 relating to petroleum activities, section 10-18 and Act 10 February 1967 relating to procedure in cases concerning the public administration, section 13 c third paragraph and

*continental shelf for storage of CO<sub>2</sub> and relating to transportation of CO<sub>2</sub> on the continental shelf*,<sup>168</sup> and (c) *Regulations relating to materials and documentation in connection with surveys for and utilisation of subsea reservoirs on the continental shelf to store CO<sub>2</sub>*.<sup>169</sup> Further, as Norway is part of the European Economic Area Agreement, *Directive 2009/31/EC*<sup>170</sup> applies. The sections below discuss some of the key elements of the legal frameworks on CCS: (a) assessments and approvals (to permit CCS activities); (b) liabilities and responsibilities, and (c) ownership (who owns the greenhouse substance injected into the ground). It will not provide an exhaustive review of the legal framework due to the word limit of this thesis.

Norway did not have specific legislation on CCS at the time when the Sleipner and Snøvit projects were permitted. Instead, they were authorised under the *Petroleum Activities Act 1996*, the *Pollution Control Act 1981*,<sup>171</sup> and the Regulations relating to petroleum activities and CO<sub>2</sub> storage. Despite the lack of specific CCS legislation, Norway successfully developed its CCS activities, maintaining a balance between the project developers and the national authorities.<sup>172</sup>

### *3.2.1 Assessment and Approvals*

Based on the Regulation relating to petroleum activities, a licensee (holding a petroleum production licence) must obtain consent for injecting and storing CO<sub>2</sub> in a subsea

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section 19 third paragraph and Section 3 of Act No. 12 of 21 June 1963 relating to scientific research and exploration for and exploitation of subsea natural resources other than petroleum resources.'

<sup>168</sup> These Regulations were laid down by a 'Royal Decree on 5 December 2014 pursuant to Section 3 of Act No. 12 of 21 June 1963 relating to scientific research and exploration for and exploitation of subsea natural resources other than petroleum resources.'

<sup>169</sup> These Regulations were laid down by the 'Norwegian Petroleum Directorate on 13 December 2017 pursuant to Section 3 of Act No. 12 of 21 June 1963 relating to scientific research and exploration for and exploitation of subsea natural resources other than petroleum resources, cf. Sections 1-11, 2-6 and 11-23 of Regulation No. 1517 of 5 December 2014 relating to exploitation of subsea reservoirs on the continental shelf for storage and transport of CO<sub>2</sub> on the continental shelf, Sections 10-18 of Act No. 72 of 29 November 1996 relating to petroleum activities, cf. Sections 46, 53 and 86 of Regulation No. 653 of 27 June 1997 relating to the Act relating to petroleum activities.' This Regulation applies for data acquisition and documentation relating to surveys and exploration for the storage of CO<sub>2</sub> and exploitation of subsea reservoirs.

<sup>170</sup> *Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide and amending Council Directive 85/337/EEC, European Parliament and Council Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC, 2008/1/EC and Regulation (EC) No 1013/2006* [2009] OJ L 140/114 ('*Directive 2009/31/EC*').

<sup>171</sup> Act of 13 March 1981 No. 6 concerning protection against pollution and concerning waste.

<sup>172</sup> M. Lupion, Holly Javedan and Howard Herzog, 'Challenges to Commercial Scale Carbon Capture and Storage: Regulatory Framework' (Working Paper, Massachusetts Institute of Technology, 2015) 8 <[https://sequestration.mit.edu/pdf/2015\\_WorkingPaper\\_CCS\\_Regulations\\_Lupion.pdf](https://sequestration.mit.edu/pdf/2015_WorkingPaper_CCS_Regulations_Lupion.pdf)>.

reservoir.<sup>173</sup> The consent for doing so is granted by the Ministry.<sup>174</sup> <sup>175</sup> The consent must be compatible with the storage permit.<sup>176</sup> A storage location is only considered to be closed (i.e. shutdown) if the conditions for shutdown in the storage licence have been met and the King has consented to it.<sup>177</sup>

Based on the Regulation on CO<sub>2</sub> storage, an operator must have a licence to conduct a survey,<sup>178</sup> exploration,<sup>179</sup> exploitation of subsea reservoirs on storage of CO<sub>2</sub>,<sup>180</sup> and transportation of CO<sub>2</sub> on the continental shelf. Only the State can conduct surveying, exploration, and exploitation of subsea reservoirs without a licence.<sup>181</sup> The Minister shall designate or appoint an operator when granting an exploration licence, licence for storing CO<sub>2</sub>, or licence for installation and operation of a facility for transporting CO<sub>2</sub>.<sup>182</sup> This Regulation is similar to the above Regulation relating to petroleum activities on the requirement of consent for injecting and storing CO<sub>2</sub><sup>183</sup> and storage location shutdown.<sup>184</sup>

*Directive 2009/31/EC* sets out a regulatory framework for CCS exploration and storage.<sup>185</sup> Norway is not a member of the European Union but is part of the European Economic Area Agreement.<sup>186</sup> The Directive functions similar to the *OPGGSA 2006*. Member States must obtain an exploration permit and storage permit from the Commission in order to carry out exploration and storage activities.<sup>187</sup> A storage site shall be closed if the relevant conditions are met as stated in the permit.<sup>188</sup>

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<sup>173</sup> *Regulations to Act relating to petroleum activities 1997* (Norway) s 30e.

<sup>174</sup> According to *Regulations to Act relating to petroleum activities 1997* (Norway) s 2(a), the Ministry means the Royal Ministry of Petroleum and Energy.

<sup>175</sup> *Regulations to Act relating to petroleum activities 1997* (Norway) s 30e.

<sup>176</sup> *Regulations to Act relating to petroleum activities 1997* (Norway) s 30e. The conditions for consent is laid down in *Regulations to Act relating to petroleum activities 1997* (Norway) s 30f.

<sup>177</sup> *Regulations to Act relating to petroleum activities 1997* (Norway) s 30j.

<sup>178</sup> *Regulations to Act relating to exploitation of subsea reservoirs on the continental shelf for storage of CO<sub>2</sub> and relating to transportation of CO<sub>2</sub> on the continental shelf* ch 2.

<sup>179</sup> *Regulations to Act relating to exploitation of subsea reservoirs on the continental shelf for storage of CO<sub>2</sub> and relating to transportation of CO<sub>2</sub> on the continental shelf* ch 3.

<sup>180</sup> *Regulations to Act relating to exploitation of subsea reservoirs on the continental shelf for storage of CO<sub>2</sub> and relating to transportation of CO<sub>2</sub> on the continental shelf* ch 4.

<sup>181</sup> *Regulations to Act relating to exploitation of subsea reservoirs on the continental shelf for storage of CO<sub>2</sub> and relating to transportation of CO<sub>2</sub> on the continental shelf* s 1-4.

<sup>182</sup> *Regulations to Act relating to exploitation of subsea reservoirs on the continental shelf for storage of CO<sub>2</sub> and relating to transportation of CO<sub>2</sub> on the continental shelf* s 1-8.

<sup>183</sup> *Regulations to Act relating to exploitation of subsea reservoirs on the continental shelf for storage of CO<sub>2</sub> and relating to transportation of CO<sub>2</sub> on the continental shelf* s 5-2.

<sup>184</sup> *Regulations to Act relating to exploitation of subsea reservoirs on the continental shelf for storage of CO<sub>2</sub> and relating to transportation of CO<sub>2</sub> on the continental shelf* s 5-7.

<sup>185</sup> *Directive 2009/31/EC* art 1(1).

<sup>186</sup> The *Directive 2009/31/EC* entered into force on 1 June 2013 in Norway. Norway's relationship with the European Union is discussed in Chapter 3 section 1.4.

<sup>187</sup> *Directive 2009/31/EC* art 5(1) and 6(1).

<sup>188</sup> *Directive 2009/31/EC* art 17(1)(a).



### 3.2.2 Liabilities and Responsibilities

Based on the Regulation relating to petroleum activities, the transfer of liability to the State takes place when all obligations to shut down a storage location have been fulfilled. The transfer of responsibility will only be valid if the following conditions are met: (a) a minimum period of no less than 20 years have expired; (b) financial requirements under *Section 30m* of the Regulation relating to petroleum activities have been met; and (c) the storage location has been abandoned and the injection facilities have been removed.<sup>189</sup> The operator must then submit a report to the Ministry showing that all these conditions have been met.<sup>190</sup> The Ministry will then decide on the closure of the storage location. After a storage location is closed, responsibility is transferred to the State, and the operator will remain responsible for monitoring, reporting and implementing corrective measures in line with the Regulations.<sup>191</sup> Liabilities and responsibilities under the Regulation on CO<sub>2</sub> storage are the same.<sup>192</sup>

Based on the Directive, when a storage site is closed, there a number of conditions to be met before the transfer of liability.<sup>193</sup> These include: (a) evidence that the 'stored CO<sub>2</sub> will be completely and permanently contained'; (b) a minimum period of 20 years has elapsed; (c) financial obligations have been fulfilled; and (d) the 'site has been sealed and the injection facilities have been removed.'<sup>194</sup> The operator then has to prepare a report stating that all the conditions have been met in order for the competent authority<sup>195</sup> to approve the transfer of responsibility.<sup>196</sup>

Another step that has to be taken before the transfer of responsibility is that the operator has to pay a security which must cover at least the cost of monitoring for a period of 30 years.<sup>197</sup> This is done to ensure that the CO<sub>2</sub> is 'completely and permanently contained' in the storage sites after the transfer of responsibility.<sup>198</sup> This is an important clause before liability transfers to the Member States. When a storage site has been closed, the long-term

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<sup>189</sup> *Regulations to Act relating to petroleum activities 1997* (Norway) s 30k.

<sup>190</sup> *Regulations to Act relating to petroleum activities 1997* (Norway) s 30k.

<sup>191</sup> *Regulations to Act relating to petroleum activities 1997* (Norway) s 30j and 30k.

<sup>192</sup> *Regulations to Act relating to exploitation of subsea reservoirs on the continental shelf for storage of CO<sub>2</sub> and relating to transportation of CO<sub>2</sub> on the continental shelf* s 5-7 and 5-8.

<sup>193</sup> *Directive 2009/31/EC* art 18(1).

<sup>194</sup> *Directive 2009/31/EC* art 18(1)(a)-(d).

<sup>195</sup> The competent authority is designated by the Member States. See *Directive 2009/31/EC* art 23.

<sup>196</sup> *Directive 2009/31/EC* art 18(2).

<sup>197</sup> *Directive 2009/31/EC* art 20(1).

<sup>198</sup> *Directive 2009/31/EC* art 20(1).

liability for the CCS activities is transferred to the Member States.<sup>199</sup> The *OPGGSA 2006* has less requirements before a transfer of liability takes effect.

### *3.2.3 Ownership*

The Regulation relating to petroleum activities and the EU Directive is silent on the issue of ownership. However, according to the Regulation on CO<sub>2</sub> storage, it is clearly stated that the ownership of subsea reservoirs for storage of CO<sub>2</sub> vests with the Norwegian State.<sup>200</sup>

### *3.3 Comparative Summary of Carbon Capture and Storage Regulation in Australia and Norway*

In Australia and Norway, the assessment and approval process are similar; both require an operator to have a permit or a licence before carrying out activities associated with CCS. However, the difference lies in terms of liabilities and responsibilities, and ownership. The Norwegian Regulation and the EU Directive have stricter requirements for a transfer of liability to take effect; the *OPGGSA 2006* has less requirements in doing so. The management of long-term liability is silent in Victoria, Queensland, and SA legislation. The Australian Commonwealth legislation (*OPGGSA 2006*) and *BIA 2003* (WA) is also silent on the issue of ownership. However, the Norwegian Regulation on CO<sub>2</sub> storage clearly vests ownership of subsea reservoirs for CO<sub>2</sub> storage with the Norwegian State. CCS laws in Norway are stricter but it is not a deterrent and does not stop companies from operating in Norway despite strict CCS laws.

In Australia, the States and the Commonwealth laws contain differences on the key elements (liabilities and ownership). Therefore, it is essential to have a unified and consistent approach across Australia to elevate CCS development.<sup>201</sup> There should be conformity especially on the key element of long-term liability; the best approach is to adopt the legal framework of the *OPGGSA 2006* on this element.<sup>202</sup>

The legal framework on CCS in Australia is still immature and needs to be improved to encourage CCS development.<sup>203</sup> The lack of a comprehensive legal framework is slowing

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<sup>199</sup> Directive 2009/31/EC art 18(8).

<sup>200</sup> Regulations to Act relating to exploitation of subsea reservoirs on the continental shelf for storage of CO<sub>2</sub> and relating to transportation of CO<sub>2</sub> on the continental shelf (Norway) s 1-2.

<sup>201</sup> A. Vuksic, 'Carbon Capture and Storage in Australia: Long-Term Liability Frameworks in a Post-Paris Agreement World' (2017) 1 *Western Australian Student Law Review* 18, 33.

<sup>202</sup> A. Vuksic, 'Carbon Capture and Storage in Australia: Long-Term Liability Frameworks in a Post-Paris Agreement World' (2017) 1 *Western Australian Student Law Review* 18, 34.

<sup>203</sup> M. Lupion et al, 'Challenges to Commercial Scale Carbon Capture and Storage: Regulatory Framework' (Working Paper, Massachusetts Institute of Technology, 2015) 14  
<[https://sequestration.mit.edu/pdf/2015\\_WorkingPaper\\_CCS\\_Regulations\\_Lupion.pdf](https://sequestration.mit.edu/pdf/2015_WorkingPaper_CCS_Regulations_Lupion.pdf)>.

the progress of CCS projects as it creates uncertainties.<sup>204</sup> This is evident on the issue of long-term liability. The gaps created lead to uncertainty and discourage investment.<sup>205</sup>

## Conclusion

Carbon sequestration is a mechanism that can be used to reduce GHGe. Norway has developed more CCS projects than Australia over the last two decades. The Norwegian Government and oil and gas companies have shown their willingness to invest in CCS. It may be a preferred option in Norway due to EOR to increase the amount of oil that could be recovered from the reservoir. Also, CCS is more economically viable in Norway due to the existence of a price on carbon, making it very expensive to emit.

The impetus to develop CCS is significantly affected by relative costs of emissions. If there is no cost on emissions, there will be relatively less reason to invest in CCS. In Norway, the carbon tax was an important driver of CCS development. Emitters had a financial incentive to find alternative solutions to reduce the amount payable as a carbon price. Further, a carbon tax provides certainty and gives investors a long-term investment signal. A country with a carbon tax can use the revenue to help CCS development. A price on carbon pushes the need for CCS which is seen in the Norwegian CCS development process.

Australia does not have a price on carbon to drive CCS investment. The Australia Institute believes that CCS is still way behind in terms of commercial viability and uptake.<sup>206</sup> However, this situation changed after the development of the Gorgon project. One of the main issues with CCS development is the high costs involved. It is admitted that very few CCS projects exist in Australia as the technology required remains very expensive. The Australian Government has spent a lot of money to develop CCS; most projects, however, have not been successful.<sup>207</sup> The Commonwealth Scientific and Industrial Research Organisation is trying to reduce the cost and make CCS a viable option in Australia. Therefore, if incentivizing measures are taken such as providing loans, tax rebates, and subsidies the uptake of CCS

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<sup>204</sup> M. Lupion et al, 'Challenges to Commercial Scale Carbon Capture and Storage: Regulatory Framework' (Working Paper, Massachusetts Institute of Technology, 2015) 15  
<[https://sequestration.mit.edu/pdf/2015\\_WorkingPaper\\_CCS\\_Regulations\\_Lupion.pdf](https://sequestration.mit.edu/pdf/2015_WorkingPaper_CCS_Regulations_Lupion.pdf)>.

<sup>205</sup> A. Vuksic, 'Carbon Capture and Storage in Australia: Long-Term Liability Frameworks in a Post-Paris Agreement World' (2017) 1 *Western Australian Student Law Review* 18, 37.

<sup>206</sup> B. Browne and T. Swann, *Money for Nothing* (Report, May 2017) 6  
<[https://www.tai.org.au/sites/default/files/P357%20Money%20for%20nothing\\_0.pdf](https://www.tai.org.au/sites/default/files/P357%20Money%20for%20nothing_0.pdf)>.

<sup>207</sup> B. Browne and T. Swann, *Money for Nothing* (Report, May 2017) 6  
<[https://www.tai.org.au/sites/default/files/P357%20Money%20for%20nothing\\_0.pdf](https://www.tai.org.au/sites/default/files/P357%20Money%20for%20nothing_0.pdf)>.

may increase. It is also a long-term investment project. As such, there needs to be a level of certainty and reduced cost in pursuing the project.

Australia and Norway have confronted the same or similar barriers, but Norway seems clearly to have moved more quickly on CCS development than Australia. Despite having stricter CCS laws in Norway, it is not a deterrent to CCS development. Therefore, providing greater certainty in the Australian regulatory framework on CCS, and a financial incentive of a price on carbon, is the most important factor to encourage the development of CCS to reduce GHGe.<sup>208</sup>

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<sup>208</sup> A. Vuksic, 'Carbon Capture and Storage in Australia: Long-Term Liability Frameworks in a Post-Paris Agreement World' (2017) 1 *Western Australian Student Law Review* 18, 37.

## Conclusion

Based on my research, Australia and Norway are not on track to meet their *Paris Agreement 2015*<sup>1</sup> (PA) targets. This is because both countries are heavily involved in the fossil fuel industry; Australia in the coal and gas industry and Norway in the petroleum industry. Greenhouse gas emissions (GHGe) from the fossil fuel industry have been rising in both countries in the past decade, even where modest reductions in GHGe have been made in other sectors of the economy. In Australia, total GHGe have risen since 2014, while in Norway total GHGe have been slowly reducing since 2015. The challenge for both countries remains on how to reduce GHGe from the fossil fuel industry to meet their PA commitments.

This thesis explores how to regulate for the reduction of GHGe in the fossil fuel industry. It involves a comparative analysis of the Australian and Norwegian legislation and policies. The international legal framework has set emissions reduction targets and both countries, have introduced a range of policies to reduce GHGe. This thesis has examined four instruments (command and control regulation and market-based instruments) used by Norway to reduce GHGe; namely, (a) carbon tax, (b) emissions trading scheme (ETS), (c) renewable energy (RE), and (d) carbon capture and storage (CCS). Norway has shown that, by using these instruments, it has been able to maintain high amounts of production of oil and gas at the same time as stabilising and, in 2015-2018, slowly reducing its GHGe.<sup>2</sup>

Australia, on the other hand, has discarded its carbon tax and ETS, maintaining only limited command and control measures in the Safeguard Mechanism (SM) and limited incentive measures in the Emissions Reduction Fund (ERF), currently the Climate Solutions Package (CSP), and Renewable Energy Target (RET). The Norwegian example has shown that both command and control regulation and market-based instruments (carbon tax and ETS) are needed to regulate GHGe effectively. Market-based instruments are preferred as they reduce the rigidity in the command and control system and their effectiveness depends on command and control regulation built into the system to ensure that emitters comply with the rules. This is seen in the Norwegian *CO<sub>2</sub> Tax Act 1991*. As such, the comparison is

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<sup>1</sup> *Paris Agreement*, opened for signature 12 December 2015, [2016] ATS 24 (entered into force 09 November 2016) (*'Paris Agreement'*).

<sup>2</sup> Statistics Norway, *Klimagassutslipp ned 1,6 prosent* (Web Page, 11 December 2018) <<https://www.ssb.no/natur-og-miljo/artikler-og-publikasjoner/klimagassutslipp-ned-1-6-prosent>>; Statistics Norway, *Emissions to Air* (Web Page, 14 January 2020) <[ssb.no/en/klimagassn](https://www.ssb.no/en/klimagassn)>. GHGe data for 2019 is not available yet.

valuable as Australia can benefit from the implementation of such instruments and reduce its GHGe.

The different views and political scenarios in Australia and Norway have led to different climate policy outcomes. The Norwegian Government has prioritised environmental concerns starting from the late 1980s and has been working on improving climate policies ever since. The Australian Government, on the other hand, has a different mindset in terms of regulating GHGe and on environment matters as the economy is heavily dependent on the fossil fuel industries, especially the coal and LNG industries.

The differences in the geographical and geological resources of each country has led to different energy and climate policies. Norway has a legacy of more than a century in hydropower and Australia has a legacy of a century of coal. The two countries' different energy legacies, views, and political scenarios help to explain the evolution of different climate policies in each country. Also, as Equinor is a State-owned oil company involved in the petroleum industry, it is easier for the Norwegian Government to influence industry decisions compared to Australia, which does not have a State-owned oil company.

In 2010, Australia pledged to reduce emissions by 5% below 2000 levels by 2020<sup>3</sup> and in 2015 Australia made its *PA* pledge to reduce GHGe by '26 to 28 per cent below 2005 levels by 2030'.<sup>4</sup> However, the current climate change mitigation legislation and policies are clearly insufficient to achieve the *PA* targets. According to the current Prime Minister, Scott Morrison, the *PA* target can be met 'in a canter'.<sup>5</sup> The Australian Government's political actions show that achieving the *PA* target is secondary. While Morrison claims to be confident that the *PA* targets can be met, this is clearly impossible with current legislation. When Morrison replaced Malcolm Turnbull as Prime Minister in late August 2018, there was less emphasis placed on reducing GHGe. For example, the Morrison Government abandoned the National Energy Guarantee as a plan to cut GHGe in the electricity industry. Climate scientist Lesley Hughes

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<sup>3</sup> Anita Talberg, 'Australia's Part in Global Climate Action', *Parliament of Australia* (Web Page) <[https://www.aph.gov.au/About\\_Parliament/Parliamentary\\_Departments/Parliamentary\\_Library/pubs/BriefingBook44p/GlobalClimate](https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/BriefingBook44p/GlobalClimate)>.

<sup>4</sup> Australian Government Department of Industry, Science, Energy and Resources, *Australia's 2030 Climate Change Target* (Web Page) <<https://www.environment.gov.au/climate-change/publications/factsheet-australias-2030-climate-change-target>>.

<sup>5</sup> Amy Remeikis, 'PM claims Australia will meet Paris targets 'in a canter' despite emissions climbing', *The Guardian* (online, 30 September 2018) <<https://www.theguardian.com/australia-news/2018/sep/30/pm-claims-australia-will-meet-paris-target-in-a-canter-despite-emissions-climbing>>.

opines that Australia's position is similar to the US where 'they've walked away from Paris without saying it, hoping no one would notice it'.<sup>6</sup>

Australia's GHGe have risen since the repeal of the *Clean Energy Act 2011* (Cth) in 2014. Currently, there is no clear regulatory framework on GHGe for achieving the level of reductions required in Australia. The ERF (CSP) and the SM are the two main policies on GHGe regulation in Australia at a federal level. These instruments are clearly insufficient to meet the *PA* targets, as GHGe from the fossil fuel industry have been rising.

Although the Australian Government may argue that their *PA* commitments amount to a cap on emissions, the truth is that Australia does not have a legal cap and price on GHGe, unlike Norway. The first step is to set a legal cap on emissions. This is to be complemented with the market-based instrument (i.e setting a price) to reduce emissions. By setting a price on emissions, it would make fossil fuel more expensive, drive RE investment and increase the use of CCS. Although maintaining regard for the interests of stakeholders in the fossil fuel industry would remain a major concern of the Australian Commonwealth and State Governments, there is no other better option to handle the rising GHGe in Australia. Therefore, a bold move is necessary to achieve the *PA* targets. If a carbon price is placed on heavy emitters, there is a higher likelihood that they will shift to cleaner practices.

The oil and gas industry in both countries are setting targets and working on reducing their carbon footprint such as investing in renewable sources to maintain a competitive edge in the global market. Woodside and Santos are slowly adopting RE strategies, but their businesses are mainly focused on oil and gas.<sup>7</sup> Equinor is also diversifying its business from fossil fuels to other renewable sources and low-carbon energy solutions. Woodside aspires to be net zero for its operations by 2050.<sup>8</sup> Equinor also aims to reduce its net carbon intensity by at least 50% by 2050, and to improve RE capacity tenfold by 2026.<sup>9</sup>

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<sup>6</sup> Adam Morton, 'Australia Abandons Plans to Cut Carbon Emissions' (2018) 561(7723) *Nature* 293.

<sup>7</sup> Woodside, *Gas and Solar: Partners in Power* (Web Page) <<https://www.woodside.com.au/news-and-media/stories/story/gas-and-solar-partners-in-power>>; Santos, *Santos rolls out renewable energy in the Cooper basin* (Web Page, 18 December 2018) <<https://www.santos.com/media-centre/announcements/santos-rolls-out-renewable-energy-in-the-cooper-basin/>>.

<sup>8</sup> Woodside, *Climate Change* (Web Page) <<https://www.woodside.com.au/sustainability/climate-change>>.

<sup>9</sup> Equinor, *Equinor Sets Ambition to Reduce Net Carbon Intensity by at Least 50% by 2050* (Web Page, 6 February 2020) <<https://www.equinor.com/en/news/2020-02-06-climate-roadmap.html>>.

Further, the Australian and Norwegian oil and gas companies have proposed displacing coal with gas.<sup>10</sup> Equinor argues that gas can reduce CO<sub>2</sub> emissions by displacing coal in the European market,<sup>11</sup> while Woodside makes similar claims about supplying LNG to its customers.<sup>12</sup> Woodside also claims that gas will partner with renewables,<sup>13</sup> while Equinor proposes decarbonising its oil and gas production ‘growing within wind and solar’.<sup>14</sup> Thus, oil and gas companies in both countries are taking steps to reduce GHGe from the fossil fuel industry but will this be enough for both countries to achieve their *PA* commitments?

Both countries are relying on reduction of GHGe from other industry sectors to reduce total levels of GHGe. Australia’s actions in reducing emissions from other sectors such as electricity generation, transportation, general industry and mining are insufficient to meet even the current modest *PA* target. Although the electricity sector has recently been reducing emissions through the rapid increase in RE, the total RE electricity generation is still only approximately 20% and the solar and wind component of that account for only about 7% of total electricity generation. Fossil fuel (coal and gas fired) electricity generation still accounts for 76% of the total electricity generated in 2019.<sup>15</sup> Further, GHGe from transport and energy for general industries have been increasing.<sup>16</sup>

Norway, on the other hand, is at an advantage in terms of electricity generation mainly sourced by hydropower. Norway also has been continuously working on reducing emissions in its oil and gas and transportation sectors and is more advanced (technologically and in terms of climate policies) in GHGe reductions and per capita rates of emissions. This moderate success is generally attributable to its stronger regulatory framework being more effective at driving reductions in GHGe over the past three decades.

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<sup>10</sup> Woodside, *Climate Change* (Web Page) <<https://www.woodside.com.au/sustainability/climate-change>>.

<sup>11</sup> Equinor, *Natural Gas* (Web Page, 2020) <<https://www.equinor.com/en/what-we-do/natural-gas.html>>.

<sup>12</sup> Woodside, *Climate Change* (Web Page) <<https://www.woodside.com.au/sustainability/climate-change>>.

<sup>13</sup> Woodside, *Gas and Solar: Partners in Power* (Web Page, 15 November 2018) <<https://www.woodside.com.au/news-and-media/stories/story/gas-and-solar-partners-in-power>>.

<sup>14</sup> Equinor, *Renewables and CCS* (Web Page) <<https://www.equinor.com/en/what-we-do/new-energy-solutions.html#:~:targetText=Equinor%20Energy%20Ventures%20is%20our,of%20four%20to%20s even%20years.>>>. However, Equinor was proposing to explore for oil and gas in the Arctic and in Australia’s Southern Ocean, at the Great Australian Bight. In December 2019, Equinor withdrew from the Great Australian Bight. Source: Equinor, *Australia* (Web Page) <<https://www.equinor.com/en/where-we-are/australia.html>>.

<sup>15</sup> Clean Energy Council, *Clean Energy Australia Report 2020* (Report, 2020) 11 <<https://assets.cleanenergycouncil.org.au/documents/resources/reports/clean-energy-australia/clean-energy-australia-report-2020.pdf>>.

<sup>16</sup> Department of Industry, Innovation and Science, Parliament of Australia, *Quarterly Update of Australia’s National Greenhouse Gas Inventory: September 2019* (Report, 2020) 8.



There is no single instrument that can reduce GHGe effectively across the entire economy; each instrument has its strengths and weaknesses. In Australia, the only policies in place are the ERF (CSP) and SM. Norway has the three Acts (*Pollution Control Act 1981*; *Greenhouse Gas Emissions Trading Act 2004*; and *Climate Change Act 2017*) that hold emitters legally accountable for their emissions. The International Energy Agency asserts that 'more than 80% of Norwegian GHG emissions are covered by taxes and/or the EU Emissions Trading Scheme (EU-ETS).'<sup>17</sup> Australia has the National Greenhouse and Energy Reporting Scheme, ERF (CSP) and SM. The SM covers GHGe from approximately 450 facilities accounting to about 60% of Australia's GHGe.<sup>18</sup> Arguably the SM imposes some price on carbon because the entity that exceeds its baseline has to buy credits. However, the problem behind this is that entities can request to increase their baseline. This indicates the problem of not having a legal cap on the level of GHGe.

Australia can learn from the Norwegian experience in the following ways.

- 1) Australia needs a legal cap on GHGe to drive its overall regulatory framework for GHGe reductions, with the cap being lowered periodically.
- 2) Australia needs to have a carbon price. It would be beneficial to have both a carbon tax and an ETS running in parallel. A carbon tax can cover mobile sources, mainly transport fuels. This can then be extended by applying a carbon tax to the production of oil and gas like the Norwegian carbon tax ('double regulation' for the oil and gas industry). An ETS can cover emissions from electricity generation, direct combustion, industrial processes, and fugitive emissions.
- 3) Australia needs to have a legislated carbon budget as it provides a binding effect, forces action, and increases commitment on reducing GHGe.
- 4) Further, it can be argued that Australia could use a RE target beyond 2020 to increase RE in the electricity sector.

The carbon tax and ETS sets the framework for driving investment in RE and CCS by making it expensive to pollute. When the carbon pricing mechanism was in place in Australia, RE investment increased. The price on carbon also pushes the need for CCS which is seen

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<sup>17</sup> International Energy Agency, 'Energy Policies of EIA Countries: Norway 2017 Review' (Web Page) 24 <<http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>>, archived at <<https://web.archive.org/web/20180919222931/http://www.iea.org/publications/freepublications/publication/EnergyPoliciesofIEACountriesNorway2017.pdf>>.

<sup>18</sup> Reputex, 'Industry emissions surge to record high as "safeguard mechanism" fails', *Renew Economy* (Web Page, 12 February 2020) <<https://reneweconomy.com.au/industry-greenhouse-gas-emissions-surge-to-record-high-60-increase-on-2005-levels-with-more-growth-ahead-42198/>>.

in the Norwegian CCS development process. This has made Norway move more quickly on CCS development than Australia.

This thesis is important as it compares two countries on GHGe regulation in the fossil fuel industry and makes a significant contribution to the literature in this regard. It has highlighted the four main instruments used to regulate GHGe in Norway and their effectiveness. Norway appears to be more successful than Australia in limiting and reducing GHGe despite being actively involved in the fossil fuel industry. What remains uncertain is the future of the oil and gas industry in both Australia and Norway. Eventually, the oil and gas industry has to be phased out in both countries as it is almost impossible to achieve the PA goal of net zero emissions by 2050 with the oil and gas industry in operation. Both countries will have to greatly reduce or even terminate their fossil fuel industries in so far as they are structured to produce a fuel to burn. Instead, both countries will have to transition to alternative sources of energy. The Australian Government has recently released the Technology Investment Roadmap in May 2020 for public consultation, aiming to release Australia's Long Term Emissions Reduction Strategy before the 26<sup>th</sup> Conference of Parties.<sup>19</sup> In this report, Australia states it aim to be at the 'forefront of the global low emissions technological innovation' and enter into an international cooperation agreement focusing on CCS, hydrogen, and renewable electricity trade.<sup>20</sup> However, Norway still has plans to drill in the Arctic endorsed by the Oslo Court of Appeal.<sup>21</sup> As a result, Greenpeace has taken this lawsuit to Norway's Supreme Court.<sup>22</sup>

The oil and gas market has been affected due to the Covid-19 global pandemic; lower demand and prices.<sup>23</sup> As a result, total emissions in Australia were lower in the June quarter

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<sup>19</sup> Department of Industry, Science, Energy and Resources, Parliament of Australia, *Technology Investment Roadmap Discussion Paper: A Framework to Accelerate Low Emissions Technologies* (Report, May 2020) 4 <[https://consult.industry.gov.au/climate-change/technology-investment-roadmap/supporting\\_documents/technologyinvestmentroadmapdiscussionpaper.pdf](https://consult.industry.gov.au/climate-change/technology-investment-roadmap/supporting_documents/technologyinvestmentroadmapdiscussionpaper.pdf)>.

<sup>20</sup> Department of Industry, Science, Energy and Resources, Parliament of Australia, *Technology Investment Roadmap Discussion Paper: A Framework to Accelerate Low Emissions Technologies* (Report, May 2020) 4, 7 <[https://consult.industry.gov.au/climate-change/technology-investment-roadmap/supporting\\_documents/technologyinvestmentroadmapdiscussionpaper.pdf](https://consult.industry.gov.au/climate-change/technology-investment-roadmap/supporting_documents/technologyinvestmentroadmapdiscussionpaper.pdf)>.

<sup>21</sup> Alister Doyle, 'Oslo court backs Arctic oil exploration in defeat for environmentalists', *Climate Home News* (Web Page, 23 January 2020) <<https://www.climatechangenews.com/2020/01/23/oslo-court-backs-arctic-oil-exploration-defeat-environmentalists/>>.

<sup>22</sup> Megan Darby, 'Greenpeace takes Arctic oil lawsuit to Norway's Supreme Court', *Climate Home News* (Web Page, 21 April 2020) <<https://www.climatechangenews.com/2020/04/21/greenpeace-takes-arctic-oil-lawsuit-norways-supreme-court/>>.

<sup>23</sup> Nick Toscano, 'Energy giant Woodside takes \$6.3bn hit as COVID-19 reshapes oil market', *The Sydney Morning Herald* (online, 14 July 2020) <<https://www.smh.com.au/business/companies/energy-giant-woodside-takes-6-3bn-hit-as-covid-19-reshapes-oil-market-20200714-p55c0i.html>>.

2020 than the June quarter 2019.<sup>24</sup> This situation might impact on the feasibility of implementing regulatory reform in Australia. However, the Morrison Government in September 2020 has been championing a ‘gas-fired recovery’ from the economic shock of the Covid-19 pandemic.<sup>25</sup> The Government’s claim is that developing new gas reserves and the gas market will lower electricity prices, boost manufacturing, complement the development of renewables and reduce Australia’s emissions. However, the lack of a legal framework for a national emissions budget and means of securing of GHGe reductions shows that the focus of the Morrison Government is on extending the fossil fuel industry, rather than fulfilling Australia’s commitments to reduce GHGe under international climate agreements. An interesting question for further research would be whether the fossil fuel industry can create a future for itself in producing hydrogen and what regulatory measures may assist that transition?

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<sup>24</sup> Department of Industry, Science, Energy and Resources, Parliament of Australia, *Quarterly Update of Australia’s National Greenhouse Gas Inventory: March 2020 incorporating preliminary estimates of emissions up to June 2020* (Report, March 2020) 10

<<https://www.industry.gov.au/sites/default/files/2020-08/nggi-quarterly-update-march-2020.pdf>>.

<sup>25</sup> Prime Minister of Australia, *Gas-Fired Recovery - Media Release*, (Web Page, 15 September 2020) <<https://www.pm.gov.au/media/gas-fired-recovery>>; Katharine Murphy, ‘Government to use \$52.9m funding to unlock more gas for domestic market’, *The Guardian* (online, 15 September 2020) <<https://www.theguardian.com/australia-news/2020/sep/15/government-to-use-529m-funding-to-unlock-more-gas-for-domestic-market>>.

## APPENDIX A

**Table 1: Implementing Emissions Trading Scheme and/or carbon tax – A comparison of design features<sup>1</sup>**

Design Features	ETS	Carbon tax
<b>Function</b>	Places a cap on emissions and requires the emitters to hold a permit for each tonne of CO <sub>2</sub> they emit	Imposes a price, no cap on emissions, it is the amount of tax that affects the level of emissions
<b>Scope</b>	To reduce emissions	Same
<b>Price or cap</b>	Price – no set price, achieves cap through emissions Cap – sets an initial cap which is tightened over time Allowance allocation – free or auction	Tax rate set  No cap on emissions  No allowance issued
<b>Price stability</b>	Less stable – price determined by market	Stable – tax rate is set
<b>Point of regulation</b>	Upstream, downstream or midstream	Same
<b>Enforcement</b>	Report emissions and surrender allowances according to those emissions	Easier to enforce and monitor
<b>Risk mitigation</b>	Price ceiling, price floor, banking and borrowing of allowances	Source of revenue for subsidies, it has lower risk on price
<b>Cross border linking</b>	Possible but complex	Impractical due to different legal systems
<b>Outcome of emissions reduction</b>	More certain as the cap set is on CO <sub>2</sub> emissions	Less certain because there is no cap on emissions

<sup>1</sup> The Climate Reality Project, '2017 Handbook on Carbon Pricing Instruments' (Web Page) 16-29 <[https://www.climate reality project.org/sites/climate reality project.org/files/Handbook on Carbon Financing\\_Final\\_May16.pdf](https://www.climate reality project.org/sites/climate reality project.org/files/Handbook on Carbon Financing_Final_May16.pdf)>. For easier understanding of the carbon tax and emissions trading scheme, the differences are presented in a tabular form.

<b>Design Features</b>	<b>ETS</b>	<b>Carbon tax</b>
<b>Flexibility</b>	Can adjust the supply of emissions	Can adjust the tax rate
<b>Administration</b>	Complex	Easier
<b>Cost</b>	Difficult to estimate – estimation based on emissions and allowances prices	Easier to estimate – estimation based on tax rate multiplied by the monitored/reported volume
<b>Government intervention</b>	Limited	High
<b>Perception</b>	Well perceived by Government, industry	Less well perceived by Government, industry

## APPENDIX B

**Table 2: Comparison of Australia’s equivalent ‘carbon tax’ and the Norwegian carbon tax**

<b>Design Features</b>	<b>Australian equivalent ‘carbon tax’</b>	<b>Norwegian carbon tax</b>
<b>Price</b>	Carbon price fixed at AUD23 per tonne of CO <sub>2</sub> -e from 2012-2014 for 3 years. Excise rates for fuel applied.	Started at USD40.10 per tonne of CO <sub>2</sub> emitted
<b>Continuance</b>	Repealed	Ongoing
<b>Implementing legislation</b>	<i>Clean Energy Act 2011</i> (Cth) repealed	<i>CO<sub>2</sub> Tax Act 1991</i>
<b>Greenhouse gases covered</b>	All direct scope 1 emissions: carbon dioxide, methane, nitrous oxide, Sulphur hexafluoride, and hydrofluorocarbons	Carbon dioxide
<b>Sectors covered</b>	Covered mobile sources mainly transport fuels from domestic aviation, marine and rail transport, business in off-road transport, and non-transport business uses.	Oil and gas production (charged on petroleum that is burnt and natural gas discharged into the air, CO <sub>2</sub> that is separated from petroleum and discharged into the air, and installations related with the production or transportation of petroleum). Applies to heating oil, diesel, gasoline, liquefied petroleum gas (LPG), and natural gas. GHGe from processing industries, agriculture, international air and maritime transport, fishing in

<b>Design Features</b>	<b>Australian equivalent 'carbon tax'</b>	<b>Norwegian carbon tax</b>
		distant waters, freight and passenger transport within domestic shipping sector were exempted.
<b>Implementing agencies</b>	Was administered by the Clean Energy Regulator and the Climate Change Authority.	Norwegian Petroleum Directorate
<b>Penalty for non-compliance</b>	Civil penalty	Fines and up to three months imprisonment

## APPENDIX C

**Table 3: Comparison of Australian Emissions Trading Scheme and Norwegian Emissions Trading Scheme (linked to the European Union Emissions Trading Scheme (EU ETS))<sup>2</sup>**

Design Features	Australian ETS (proposed from 1 July 2015)	Norwegian ETS linked to the EU ETS
<b>Continuance</b>	Repealed	Ongoing
<b>Price Ceiling</b>	AUD23/metric tonne of CO <sub>2</sub> -e as of July 2012 for 3 years (rising 2.5% each year); AUD20 for 2015-2018 (rising 5% annually). Price ceiling - \$20, price floor – \$15	No price ceiling and price floor, as price determined by the market. Phase I (2005-2007) – EUR20-30 Phase II (2008-2012) – EUR8-30 Phase III (2013-2020) – EUR15.82 (average 2018 price) <sup>3</sup>
<b>Greenhouse gases covered</b>	Carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbon, perfluorocarbon <sup>4</sup>	Phase I – carbon dioxide (CO <sub>2</sub> ) Phase II – nitrous oxide (N <sub>2</sub> O) Phase III – perfluorocarbons (PFC) Phase IV – no changes

<sup>2</sup> International Carbon Action Partnership, 'EU Emissions Trading System (EU ETS)' (Web Page, 8 January 2020) <[https://icapcarbonaction.com/en/?option=com\\_etsmap&task=export&format=pdf&layout=list&systems%5B%5D=43](https://icapcarbonaction.com/en/?option=com_etsmap&task=export&format=pdf&layout=list&systems%5B%5D=43)>; 'Australia: A Direct Action Case Study', *International Emissions Trading Association* (Web Page, 2016) 4 <[https://www.ieta.org/resources/Resources/Case\\_Studies\\_Worlds\\_Carbon\\_Markets/2016/Australia\\_Case\\_Study\\_092016.pdf](https://www.ieta.org/resources/Resources/Case_Studies_Worlds_Carbon_Markets/2016/Australia_Case_Study_092016.pdf)>; European Commission, European Union, *EU ETS Handbook* (2015) <[https://ec.europa.eu/clima/sites/clima/files/docs/ets\\_handbook\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/ets_handbook_en.pdf)>; Multi-Party Climate Change Committee, Parliament of Australia, *Clean Energy Agreement* <[https://www.pfpi.net/wp-content/uploads/2011/07/mpccc\\_cleanenergy\\_agreement-pdf.pdf](https://www.pfpi.net/wp-content/uploads/2011/07/mpccc_cleanenergy_agreement-pdf.pdf)>.

<sup>3</sup> International Carbon Action Partnership, 'EU Emissions Trading System (EU ETS)' (Web Page, 8 January 2020) <[https://icapcarbonaction.com/en/?option=com\\_etsmap&task=export&format=pdf&layout=list&systems%5B%5D=43](https://icapcarbonaction.com/en/?option=com_etsmap&task=export&format=pdf&layout=list&systems%5B%5D=43)>.

<sup>4</sup> *Clean Energy Act 2011* (Cth) s 5 (repealed); *National Greenhouse and Energy Reporting Act 2007* (Cth) s 7A.



Design Features	Australian ETS (proposed from 1 July 2015)	Norwegian ETS linked to the EU ETS
<b>Sectors covered</b>	Large emitters emitting more than 25,000 tonnes of CO <sub>2</sub> , emissions from stationary energy, industrial processes, fugitive emissions, waste, some emissions from business transport, synthetic greenhouse gases, combustion of biofuels and biomass. Agriculture, conventional road transport fuel industries and small businesses were exempted.	Phase I – power generations installations and energy intensive industries Phase II – aviation included Phase III – further energy intensive industries Phase IV – no changes to the scope
<b>Emissions Cap<sup>5</sup></b>	Was to set emissions cap from 2018 onwards.	Phase I – 2,058 MtCO <sub>2</sub> -e Phase II – 1,859 MtCO <sub>2</sub> -e Phase III – 2,084 MtCO <sub>2</sub> -e (in 2019, 1,855 MtCO <sub>2</sub> -e after deducting 1.74% of the LRF) Phase IV – a LRF of 2.2% will be applicable
<b>Threshold</b>	Under the ETS, >25,000 tonnes of CO <sub>2</sub> -e.	Sector specific; <sup>6</sup> Stationary installations: category A installation – average annual emissions are equal to or less than 50,000 tonnes of CO <sub>2</sub> -e; category B installation – average annual emissions are between 50,000 tonnes of CO <sub>2</sub> -e – 500,000 tonnes of CO <sub>2</sub> -e;

<sup>5</sup> European Commission, European Union, *EU ETS Handbook* (2015) 19 <[https://ec.europa.eu/clima/sites/clima/files/docs/ets\\_handbook\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/ets_handbook_en.pdf)>.

<sup>6</sup> *Commission Regulation (EU) No 601/2012 of 21 June 2012 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council* [2012] OJ L 181/30; European Commission, European Union, *EU ETS Handbook* (2015) 87 <[https://ec.europa.eu/clima/sites/clima/files/docs/ets\\_handbook\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/ets_handbook_en.pdf)>.

<b>Design Features</b>	<b>Australian ETS (proposed from 1 July 2015)</b>	<b>Norwegian ETS linked to the EU ETS</b>
		category C installation – average annual emissions are more than 500,000 tonnes of CO <sub>2</sub> -e. <sup>7</sup> Aviation sector, the threshold is calculated based on the methodologies provided in Annex II and III of the <i>Commission Regulation No 601/2012</i> . <sup>8</sup>
<b>Allowances</b>	Auction and some free allocations	Phase I – free Phase II – 10% auctioned Phase III – ½ of total allowances to be auctioned
<b>Banking</b>	First 3 years (2012-2014) banking of permits were not permitted. Unlimited – allowed under the ETS, after 2015 when carbon price was to be determined by the markets.	Allowed and can carry forward surplus allowances at the end of that year to the next phase.
<b>Borrowing</b>	First 3 years (2012-2014) borrowing of permits were not allowed. Allowed up to 5%, after 2015 when carbon price was to be determined by the markets.	Allowed – only within a trading period; not allowed to borrow allowances from another trading period.
<b>Limits on foreign allowances</b>	Would have permitted 50% foreign allowances (100% from 2020);	Can use international credits from the Clean Development Mechanism and Joint

<sup>7</sup> *Commission Regulation (EU) No 601/2012 of 21 June 2012 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council* [2012] OJ L 181/30, art 19(2).

<sup>8</sup> *Commission Regulation (EU) No 601/2012 of 21 June 2012 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council* [2012] OJ L 181/30.

<b>Design Features</b>	<b>Australian ETS (proposed from 1 July 2015)</b>	<b>Norwegian ETS linked to the EU ETS</b>
	12.5% Kyoto units sub-limit	Implementation under the Kyoto Protocol
<b>Other domestic offsets/credits</b>	Recognised Australian Carbon Credit Units (ACCU) under the Carbon Farming initiative	Phase I – Unlimited use of Clean Development Mechanism (CDM) credits and Joint Implementation (JI) credits was provided in the Directive, but in practice no credits were used. Phase II – Allowed to use credits up to a certain percentage stated in each country's National Allocation Plan Phase III – total use of credits for Phase II and III may amount to 50% of overall reduction Phase IV – use of offsets not envisaged
<b>Governance and enforcement</b>	Clean Energy Regulator, Climate Change Authority, and Productivity Commissions	European Commission
<b>Implementing legislation</b>	<i>Clean Energy Act 2011</i> (Cth) repealed	<i>Directive 2003/87/EC</i> <sup>9</sup>
<b>Penalty for non-compliance</b>	Penalty or imprisonment for the ETS.	Phase I – EUR40/tonne Phase II – EUR100/tonne Phase III – penalty not submitted, will be increased according to the European index of consumer prices

<sup>9</sup> *Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC [2003] OJ C 75E/33 ('Directive 2003/87/EC').*

<b>Design Features</b>	<b>Australian ETS (proposed from 1 July 2015)</b>	<b>Norwegian ETS linked to the EU ETS</b>
<b>Market Stability Reserve</b>	Not applicable	Started in January 2019, to balance existing surplus allowances, backloading
<b>Leakage control of allowance</b>	Trade exposed industries receive concessions	The sectors that are exposed to risk of carbon leakage are included on an official list. A formula <sup>10</sup> is used to calculate the amount of free allowances.
<b>Linking with other greenhouse gas trading systems</b>	Was to be allowed from the flexible price period (i.e. after the 3 years of fixed carbon price)	EU ETS – allowed linking

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<sup>10</sup> The formula is 'production quantity (in tonnes of product) is multiplied with the benchmark value for that particular product (measured in emissions per tonne of product)'. Source: European Commission, *Carbon Leakage* (Web Page) <[https://ec.europa.eu/clima/policies/ets/allowances/leakage\\_en](https://ec.europa.eu/clima/policies/ets/allowances/leakage_en)>.

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