

ECONOMICS

FOREIGN AND DOMESTIC OWNERSHIP IN WESTERN AUSTRALIA'S GAS MARKET

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DISCUSSION PAPER 16.09

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Abstract

There is considerable interest in understanding the proportion of resources income that accrues to Australian households. Yet few such estimates, if any, exist. This paper quantifies the share of before tax profits from the Western Australian natural gas industry that remains in Australia and in the state. In contrast to previous studies, which narrowly focus on domestic ownership of resources companies, we focus on the share of profits remaining in Australia, taking tax and royalty payments into account. This aids an understanding of how the development of natural resources contributes to Australian living standards. We also estimate the share of profits from gas consumers that remain in the country, to give a fuller picture of Australian involvement in the Western Australian gas market. A detailed firm-by-firm database is constructed and used to calculate these shares. Around 47 per cent of before tax profits generated by WA gas producers are estimated to have accrued to Australian households in 2014. Gas projects currently under construction in the state rely heavily on foreign investment, and once these projects are operational, this share could be 34 per cent. Similarly, 45 per cent of before tax profits from gas users in the state are estimated to accrue to Australian households.

Key words: natural gas, foreign ownership, Western Australia

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1. Introduction

Like the Australian economy as a whole, the oil and gas industry funds a significant proportion of its investment from overseas. This is a matter of interest for a number of domestic policy questions.

The effects of the recent growth in the resources industry on Australian living standards depends on whether the industry's income remains in Australia or flows overseas. In their work to estimate the benefits of the Australian mining boom, Downes, Hanslow and Tulipoint (2014) point out that the lack of information on foreign ownership shares is an important problem. In addition, Australian governments generally aim to receive a return from allowing the country's oil and gas resources to be exploited by applying royalties and rent taxes in the sector. Other authors, including ACIL Allen (2015), also raise foreign ownership as an important issue in evaluating policies that reserve some gas for sale on the domestic market. More generally, foreign investment is monitored due to concerns about national interest and national security.

A small number of studies have investigated the foreign-owned share of Australia's mining industry. Arsov et al. (2013) conduct a detailed investigation of the foreign contribution to the recent boom in investment for the Australian resources sector as a whole. Two other studies briefly discuss foreign ownership in the industry, although the method used to arrive at their estimates is unclear. Energy Quest (2015) notes that Australian-listed firms contribute half of petroleum production in Australia, without discussing what proportion of shareholders are Australian. Connolly and Orsmond (2011) also briefly mention an estimate of the foreign ownership share of mining operations.

This paper presents detailed estimates of the extent to which income from natural gas in Western Australia remains within both Australia and the state. In contrast to the above-mentioned studies that focus on production or investment, we choose to focus on incomes because this is important for gauging the long-term contribution of the industry to Australian living standards.

We also focus on a subsection of the resources sector, the Western Australian gas industry, which allows more detailed estimates than contained in previous studies. The number of individual gas producers and consumers in Western Australia is sufficiently small that each

can be investigated individually to produce reliable industry-wide estimates. In this paper, a unique database of firm-specific data has been constructed from publicly-available and proprietary data.

This paper starts by investigating the supply side of the market – upstream gas producers – in section 2. Next, we turn to the demand side – gas consumers such as electricity generators, manufacturing facilities and mining operations – in section 3. This focus on both sides of the gas market allows an understanding of the profits that Australians derive from both the production and consumption of natural gas.

Our main results are summarised in section 4, which also discusses how our estimates contribute to the policy debate.

2. Gas Production

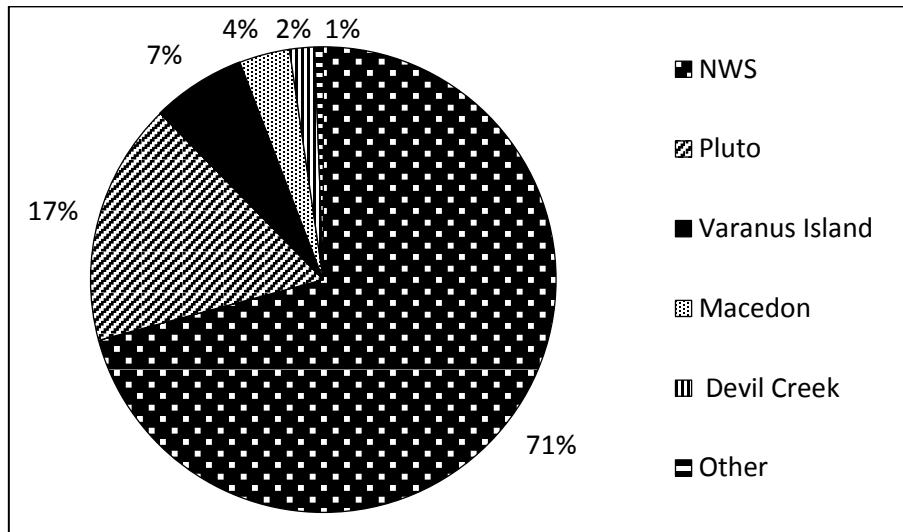
A number of steps are required to estimate the share of profits from gas production in WA. We start by identifying each project and the production levels that can be attributed to each company (section 2.1). Next, the foreign ownership of these companies is determined, based on the ownership of each firm's debt and equity (section 2.2). Next, we investigate taxes and royalties paid by the sector (section 2.3). Thus we arrive at an estimate of the share of before-tax profits that accrue to Australians (section 2.5.).

2.1. WA gas production by company

The North West Shelf (NWS) project, operated by Woodside, accounted for 71 percent of WA's gas production in 2014, as shown in Figure 1. This is the only project currently operating that produces both LNG for export and natural gas for the domestic market. The next largest is the Pluto project, which produces LNG for export. Other projects in the Carnarvon basin supply exclusively to the domestic market, including the Varanus Island, Macedon, and Devil Creek processing facilities. The Perth Basin has smaller, domestic-oriented projects, including the Beharra Springs, Red Gully, and Dongara processing facilities.¹

¹ Reports of LNG and domestic gas production from individual fields and projects (APPEA 2015, WA DMP 2015d) have been reconciled with reports of total state LNG and domestic gas production (WA DMP 2014c) to estimate production for each project during 2014.

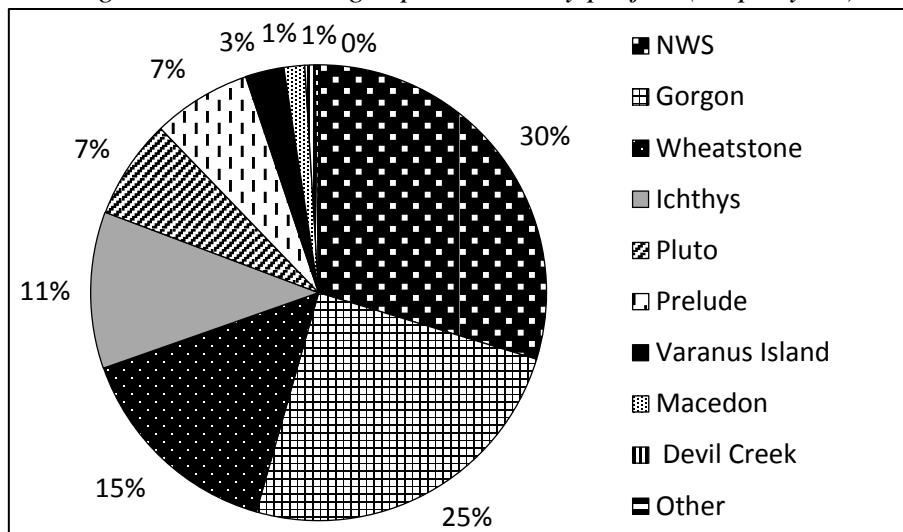
Figure 1: WA gas production by project, 2014, per cent



Source: Authors' calculations based on APPEA 2015, WA DMP 2015, and WA DMP 2014a.
Production is measured in PJ per year, after processing losses

Two more large projects, Gorgon and Wheatstone, are scheduled to begin production by mid-2016 and mid-2017 respectively (Chevron 2016). The Browse basin currently has no active projects, but two large projects, Ichthys and Prelude, are under construction. These are scheduled to begin production in 2017 (Inpex 2015, 2016). As shown in Figure 2, when these four new projects come online total production is expected to more than double and the NWS share will be reduced to only 30 percent². This has implications for the share of profits that remain in Australia, as the new projects rely heavily on foreign investment, as discussed below.

Figure 2: Future WA gas production by project (PJ per year)



Source: Authors' calculations based on APPEA 2015, WA DMP 2015, and WA DMP 2014a
Note: Assumes all projects currently under construction operate at capacity and currently-operating projects maintain 2014 production levels

² This assumes that all new projects produce at capacity and all currently-operating projects maintain their 2014 production volumes.

This production data is tabulated in more detail below. This has been estimated by reconciling DMP data (2015e) for total production of domestic gas and LNG with project and field level production data published by APPEA (2015) and the DMP (2015c).³

Table 1: 2014 production from WA gas projects, PJ

Project	Domestic	LNG	Share of active projects	Share of all projects
Current Projects				
NWS	172	901	71%	30%
Pluto	0	255	17%	7%
Varanus Island	99	0	7%	3%
Macedon	53	0	4%	2%
Devil Creek	26	0	2%	1%
Beharra Springs	5	0	0%	0%
Red Gully	3	0	0%	0%
Dongara	1	0	0%	0%
Current Total	359	1,156	100%	
Under Construction				
Gorgon	53	839		25%
Wheatstone	71	479		15%
Ichthys	0	401		11%
Prelude	0	253		7%
Future Total	483	3,128		100%

Source: Authors' calculations based on APPEA 2015, WA DMP 2015d, and WA DMP 2014c

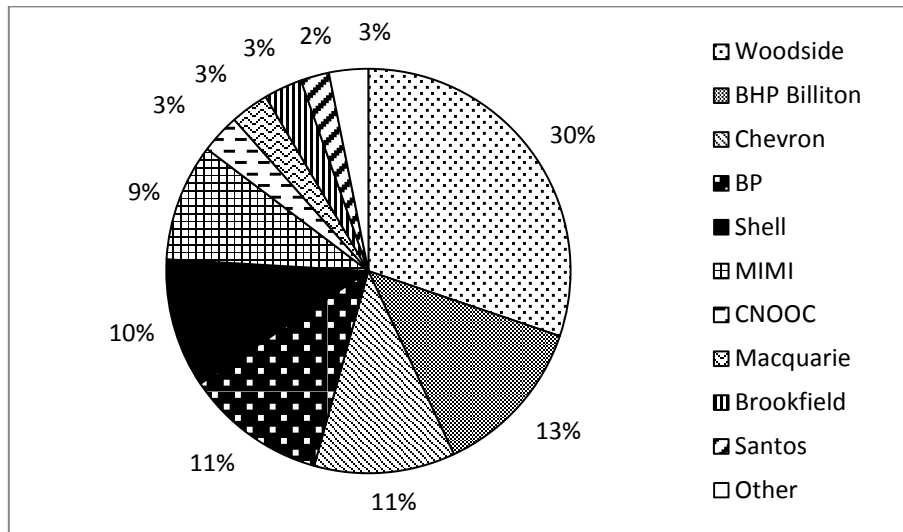
Note: columns may not add due to rounding.

Nineteen companies are involved WA's currently-producing gas projects. Aggregated estimates, presented in Figure 3, show that Woodside is responsible for the largest share of production, at 30 per cent, followed by BHP Billiton, at 13 per cent.

Six equal joint venture partners, including Woodside and BHP Billiton, participate in LNG export from the NWS along with, CNOOC, which owns a smaller 5 percent share. Woodside has a 50 per cent interest in the domestic gas part of the NWS project. Woodside also owns a large majority of the Pluto LNG export project. Japanese energy companies, usually LNG customers, own small proportions of the large projects, usually between 1 and 5 per cent.

³ Estimates exclude production and pipeline losses. WA DMP already excludes production losses from their natural gas and LNG production data. Estimates of pipeline losses for domestic supply are based on Core Energy Group (2013), but adjusted to take into account distance travelled along the Dampier to Bunbury pipeline to reach Perth.

Figure 3: Company Shares of Total 2014 Production

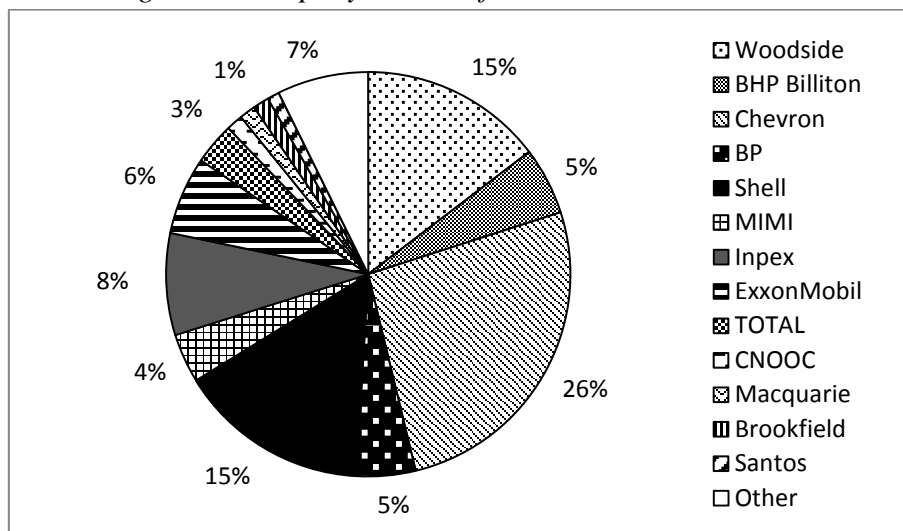


Source: Authors' calculations based on APPEA 2015, WA DMP 2015, and WA DMP 2014a, and company websites, Table A1 in the appendix

The middle-sized gas projects are owned largely by Australian companies BHP Billiton, Macquarie, and Santos, as well as the foreign Brookfield. Gas in the Perth basin, where the small gas fields are located, is extracted by smaller Australian companies.

Figure 4 shows the anticipated share of production by company once all projects currently under construction are operational. At that point, Chevron is expected to be responsible for the largest share of gas production, at 26 per cent, due to its involvement in the Gorgon and Wheatstone projects.

Figure 4: Company Shares of Total Future Production



Source: Authors' calculations based on APPEA 2015, WA DMP 2015, and WA DMP 2014a, and company websites, Table A1 in the appendix

The ownership of the state’s large projects is presented in Table 2 below, including for projects currently under construction. This information on has been compiled from company websites.

Table 2: Producer shares of large WA gas projects

Company	NWS LNG	NWS Domestic*	Pluto	Gorgon	Wheatstone	Ichthys	Prelude
Chevron	16%	17%		47%	64%		
Shell	16%	8%		25%			68%
ExxonMobil				25%			
Inpex						62%	18%
Woodside	16%	50%	90%		13%		
TOTAL						30%	
BP	16%	17%					
BHP Billiton	16%	8%					
MIMI	16%						
Kufpec					13%		
Other**	5%		10%	3%	10%	8%	14%
Total	100%		100%	100%	100%	100%	100%

Source: Company websites, see table A1 in the appendix.

Notes: * NWS domestic share is for the “NWS Domestic Gas Joint Venture”, as listed in ACIL Tasman (2009)

** ‘Other’ sums the ownership shares of all companies not listed here.

Shares are rounded to the nearest 1 per cent.

2.2. Australian ownership of WA gas companies

Each company involved in gas production in WA funds its investment by issuing either debt or equity. The Australian share of after-tax profits for each company can be estimated by examining the share of after tax profits that flow to debt and equity investors.

Arsov et. al find that “Australian resources companies have raised the majority of their debt funding through bond issuance in foreign markets, particularly the United States” (Arsov et. al 2013, p58). A review of annual reports of companies involved in the WA gas industry is consistent with this finding – confirming that the majority of debt has been issued in foreign currencies, with the US bond market playing a prominent role. Therefore, any repayments of debt made by companies producing gas in WA can be assumed to flow to overseas investors.

On the other hand, we estimate that around 61 per cent of equity on issue by Australian-based companies is owned by Australian shareholders⁴. Therefore, for companies listed on the Australian Stock Exchange (ASX), 61 per cent of profits remaining (after tax and interest payments) can be considered Australian-owned.

⁴ ABS data indicates that between March 2003 and June 2015, an average of 39 percent of equity on issue by Australian-based companies was owned outside Australia (ABS 2015a).

For companies listed on foreign stock exchanges, it is assumed that all profits remaining, after tax and interest payments, flow overseas, as the presence of Australian shareholders on foreign stock exchanges is negligible.

For companies listed on both the ASX and a foreign exchange, the share of equity owned by Australians is estimated as the proportion listed on the ASX (by market capitalisation), scaled down to reflect that 61 per cent of Australian-issued equity is owned by Australians.

For example, as shown in Table 3, BHP Billiton is listed on the ASX and the NYSE. Based on market capitalisation, 76 per cent of the company is listed on the NYSE and 24 per cent on the ASX. After subtracting foreign-owned debt and scaling down the ASX-listed share to reflect the proportion of Australian shareholders, 13 percent of after tax profits from BHP Billiton's WA gas operations are estimated to flow to Australians.

The share of profits flowing to Western Australians can be approximated by multiplying the Australian national ownership share by WA's share of the population⁵, which is approximately 11 percent (ABS 2015b). For example, this implies that Western Australians receive around 1.4 percent of BHP Billiton profits.

As shown in Table 3, most companies involved in producing gas in WA are foreign-owned.

Table 3: Domestic share of after-tax profits from gas-producing companies

Company	Listing	debt share	equity share	share of equity ASX listed	implied Australian share	implied WA share
Chevron	NYSE	11%	89%	0%	0%	0%
Shell	NYSE/LSE/AEX	21%	79%	0%	0%	0%
ExxonMobil	NYSE	31%	69%	0%	0%	0%
Inpex	TSE	0%	100%	0%	0%	0%
Woodside	ASX	5%	95%	100%	58%	6%
TOTAL	NYSE/EURONEXT	0%	100%	0%	0%	0%
BP	LSE	39%	61%	0%	0%	0%
BHP Billiton*	ASX/NYSE	11%	89%	24%	13%	1%
Macquarie**	ASX	32%	68%	100%	42%	5%
Brookfield**	NYSE	32%	68%	0%	0%	0%
MIMI	TSE	1%	99%	0%	0%	0%
Kufpec	Kuwait government	33%	67%	0%	0%	0%
Santos	ASX	17%	83%	100%	51%	6%

Source: Company 360 database, company websites (see table A2) and authors' calculations.

Notes: * BHP Billiton Petroleum (North West Shelf) Pty Ltd

** Debt and equity shares based on the Joint Venture 'Quadrant Energy Australia Limited'

⁵ This method assumes that investment patterns and per capita income is the same in all states.

The data presented in Table 3 has been compiled by collecting financial records for each company from the Company 360 database published by Dun & Bradstreet Corporation. In all cases, information for the relevant Australian subsidiary has been used, rather than the broader parent company. In some cases, very specific data is available, including for BHP Billiton Petroleum (North West Shelf) Pty Ltd and Quadrant Energy Australia Limited, which operates the assets of the joint venture between Macquarie and Brookfield.

Information on the stock exchange listings of the relevant companies has been compiled from either the company's website or directly from the relevant exchange. Table A2 in the appendix lists these sources.

Comparison to other studies

Energy Quest (2015) reports that firms listed on the ASX account for around half of Australia's petroleum production. The data presented in this and the preceding section are consistent with this, indicating that firms with ASX listings were responsible for 49 per cent of WA gas production in 2014.⁶

However, the share of production and profits attributable to Australian households will be lower than this, because companies listed on the ASX are not wholly owned by Australian shareholders. Arsov et al. take this into account, and estimate that the overall Australian-listed resources sector "is around three-quarters foreign owned" (Arsov et al. 2013, p58). Since BHP Billiton and Rio Tinto both have most of their shares listed on foreign exchanges, Arsov et al.'s estimate of foreign ownership for the resources sector as a whole will be higher than for WA gas producers. Indeed, we find that for companies with Australian listings and producing gas in WA, around 55 per cent of after tax profits flow to foreign investors.

Arsov et al. go on to conclude that for the resources sector as a whole, "around four-fifths of funding for physical investment has been sourced from offshore" (Arsov et al. 2013, p58). Similarly, Connolly and Orsmond (2011) find that the "effective foreign ownership of the current mining operations in Australia could be around four-fifths, with the share for iron ore producers a little lower and coal and LNG producers a little higher" (2011, p38). However, the method that Connolly and Orsmond (2011) use to arrive at this estimate is unclear.

⁶ This estimate treats BHP Billiton as listed on the ASX. If BHP Billiton's share is scaled down to account for the fact that 76 per cent of the company's market capitalisation is on the NYSE, this share falls to 39 per cent.

While this paper focusses on the flow of profits, rather than funding for investment, we find that around 20 per cent of after-tax profits from WA gas production flow to Australian investors, with 80 per cent flowing to foreign investors. Given that interest rates on debt are generally lower than rates of return on equity, it is likely that the foreign share of funding for investment by WA gas producers is higher than 80 per cent, consistent with assertions made by Connolly and Orsmond (2011).

2.3. Royalties and taxes on gas production

In addition to income derived as shareholders of gas-producing companies, Australians also derive income from this industry when Australian governments collect taxes and royalties. This important source of income from the sector has not been addressed in the above-mentioned studies.

Australian and State Governments apply additional taxes to the oil and gas industry, which are seen as a payment in return for access to the oil and gas resources. This is a means of ensuring that Australian households receive some benefit from allowing their resources to be depleted. The additional taxes include Australian and Western Australian royalties, and the Petroleum Resource Rent Tax (PRRT)⁷. The Australian Government also collects significant revenues from company income taxes, which are investigated here. Although the industry is subject to other taxes, such as payroll tax, these are not considered in this paper since they are small relative to company tax.

Australian Royalties

The NWS project is the major source of royalty revenue in Western Australia. The Australian Government imposes a 10 to 12.5 per cent royalty on the wellhead value of oil and gas produced by the NWS. Around 65 per cent of these royalty revenues are remitted to the Western Australian Government (WA DMP 2015b). In 2014, the WA Government received around \$1 billion in revenues from this source, implying that the total paid by the NWS project was approximately \$1.7 billion.

Woodside quarterly reports together with DMP data can be used to infer that total revenue for the NWS project was approximately \$17 billion in 2014, including the value of crude oil and

⁷ A Resource Rent Royalty (RRR) is also levied on Barrow Island production, where production is predominantly oil. The Crude Oil Excise also applies to the NWS project. Since the focus of this paper is gas production, these taxes on oil and condensate are not considered.

condensate. This indicates that Australian royalties paid by the project were 9.6 per cent of revenues in 2014⁸.

Since this paper is interested in the share of profits that flow to Australian households, we calculate the effective royalty rate as a proportion of ‘profits’ broadly defined as operating surplus before and royalties and income tax. The ‘profit’ measure that is appropriate for our purposes is equivalent to EBIT⁹ plus royalties. The Company 360 database indicates that for the ten years 2006 to 2015 Woodside EBIT averaged 49 per cent of revenues.

Together, this information indicates that participants in the NWS joint venture pay around 16.5 per cent of their profits (before income tax and royalties) in Australian Royalties¹⁰. This effective rate for Australian royalties is estimated as follows:

$$\text{Effective Aus royalty rate for NWS} = \frac{\text{total Aus royalties paid}}{(\text{royalty} + \text{EBIT rate on revenue}) * \text{NWS revenue}} \quad (1)$$

Western Australian Royalties

The Western Australian Government levies a royalty on oil and gas production within state boundaries, at a rate of 10 to 12.5 per cent of the wellhead value. In 2014, this royalty raised \$11 million (WA DMP 2014a).

Based on DMP (2015b) reports, projects producing within state boundaries include the onshore projects in the Perth Basin and part of Varanus Island, and these projects are assumed to be subject the tax. Estimates of the value of oil and gas production at these projects¹¹ indicate that 57 per cent of the royalty revenue, or \$6.3 million, is attributable to gas production.

⁸ This effective tax rate is close to the 10 – 12.5 per cent statutory rate, indicating that wellhead value was a large proportion of total revenue.

⁹ Earnings Before Interest and Income Tax. Royalties are usually defined as an operating cost, and so are subtracted from revenues to arrive at EBIT for accounting purposes.

¹⁰ This 14.9 per cent effective royalty rate is higher than the 10 to 12.5 per cent headline tax rate because it is expressed as a proportion of total estimated profits, rather than as a proportion of wellhead value.

¹¹ To estimate the value of production, DMP data (WA DMP, 2014c) on the total volume and value of LNG, Natural Gas and other petroleum products are used to estimate average prices for each commodity. After removing the estimated NWS values and volumes (based on Woodside quarterly reports), an average price for projects other than the NWS is found. This average price for 2014 is \$4.7 per GJ for pipeline gas, \$20.4 per GJ for condensate and \$19.3 per GJ for crude oil.

Combining an estimated 2014 price of \$4.7 per GJ¹¹ with production volumes at each project gives estimates of taxable revenues at the Perth Basin and Varanus Island projects. In addition, Company 360 data indicates that EBIT has averaged 37 percent of revenue in the Perth Basin¹² and 31 per cent of revenue for production at Varanus Island¹³. Together this implies that the Beharra Springs, Red Gully and Dongara facilities pay an effective royalty rate of 18.3 per cent of profits (before income tax and royalties). Varanus Island gas pays a lower rate, at 1.9 per cent, because only a small proportion of its output is sourced from within WA state borders. In summary, the effective WA royalty rate for these projects is calculated as:

$$\text{Effective WA royalty rate} = \frac{\text{total WA royalties paid on gas}}{(\text{royalty} + \text{EBIT rate on revenue}) * \text{price} * \text{taxable gas volumes}} \quad (2)$$

Petroleum Resource Rent Tax

The Petroleum Resource Rent tax (PRRT) is a profit-based tax levied by the Australian Government on all petroleum producers, offshore and onshore. All capital and operating expenditures are deductible and carried forward at the long term bond rate plus 5 percentage points. Exploration expenditures are carried forward at the long term bond rate plus 15 percentage points. These features of the PRRT mean that a project will not make PRRT payments until they have earned sufficient income to cover their capital and operating costs, plus a rate of return. As such, only the more mature and profitable projects pay the PRRT in any given year. In addition, exploration expenditure from one project can be offset against PRRT liabilities on other projects, further reducing the number of companies that pay PRRT in any given year.

According to data published by the ATO, companies operating in WA that paid PRRT in 2013-14 include BHP Billiton, Woodside, Mistui E&P (part of the MIMI joint venture) and AWE. However, it is unclear which projects these payments related to.

With the information available, indicative effective PRRT tax rates can be estimated for Woodside and AWE. In the year to 30 June 2014, Woodside paid \$86 million in PRRT

¹² Based on AWE data for years in which EBIT was positive between 2006 and 2015.

¹³ Based on data for Quadrant between 2005 and 2014.

(larger than Mistui E&P's \$63 million but smaller than BHP Billiton Petroleum (Australia)'s \$381 million, which likely includes payments from other projects). Woodside's PRRT payments equate to around 4.3 per cent of its share of pre-tax NWS profits¹⁴.

In its 2014 annual report, AWE states that it paid \$10.2 million in PRRT in 2014, with a profit before tax of \$96.4 million, implying an effective tax rate of around 9 per cent of pre-tax profits¹⁵.

However, since PRRT is an income tax, it is included in the tax expenditures reported in the Company 360 database, together with company income tax. This is discussed below.

Income Tax

The effective income tax rate for gas-producing companies in WA can be estimated from data included in the Company 360 database. Effective income tax rates are first calculated as an average percentage of EBIT over the years covered in the database. In general, this means that effective company income tax rates should be below the 30 per cent statutory rate because interest payments are deductible against company tax, but are not deducted from EBIT. However, since PRRT is also paid by oil and gas producers, the effective tax rate can be higher. Origin Energy and Tokyo Gas have the effective lowest tax rates, at 12-13 per cent. AWE has the highest average rate, at 45 per cent of EBIT, consistent with the company's high effective PRRT rate, as discussed in the previous section.

Data is available for 17 of the 28 companies expected to be operating in the sector once all WA gas projects are on line. These companies account for 93 per cent of anticipated gas production in WA. The companies for which data is not available, mostly Japanese utility companies, are assumed to pay the average tax rate, which is 29 per cent of EBIT.

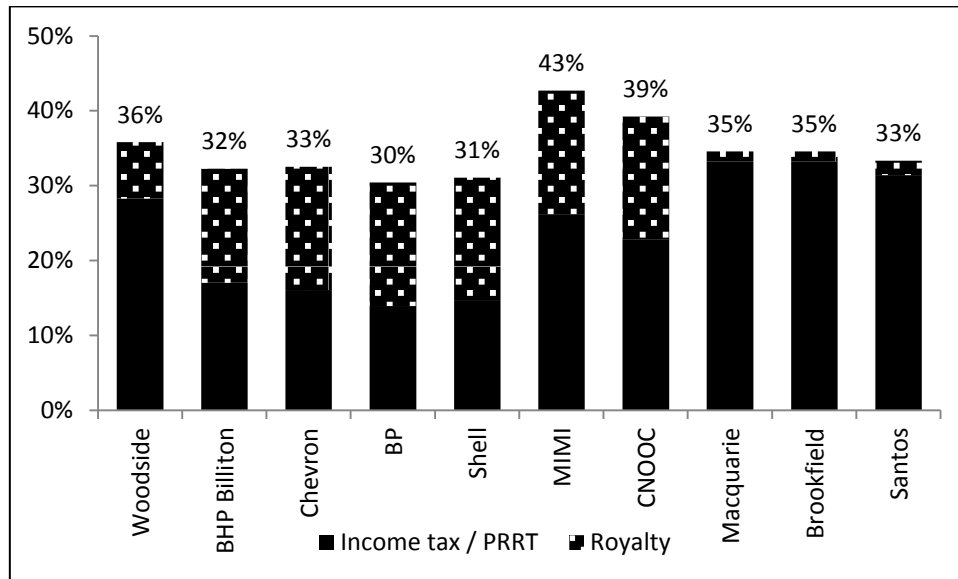
Total effective tax rate

The total estimated effective tax rate, as a proportion of before tax profits, is shown for the key companies in Figure 5 below. The total tax rates shown include Australian and WA Royalties, PRRT and company income tax.

¹⁴ Pre-tax profits are estimated in the same way as described above, using Woodside quarterly reports to find revenue and a before tax profit rate of 58 per cent (which is EBIT + royalties / revenue).

¹⁵ Pre-tax profits before income tax and royalties, estimated using information that EBIT averaged 37 per cent of revenues at AWE (Company 360) and royalties are 8.3 per cent of revenue (see above).

Figure 5: Effective tax and royalty rates on profits from gas production, Australia, 2014

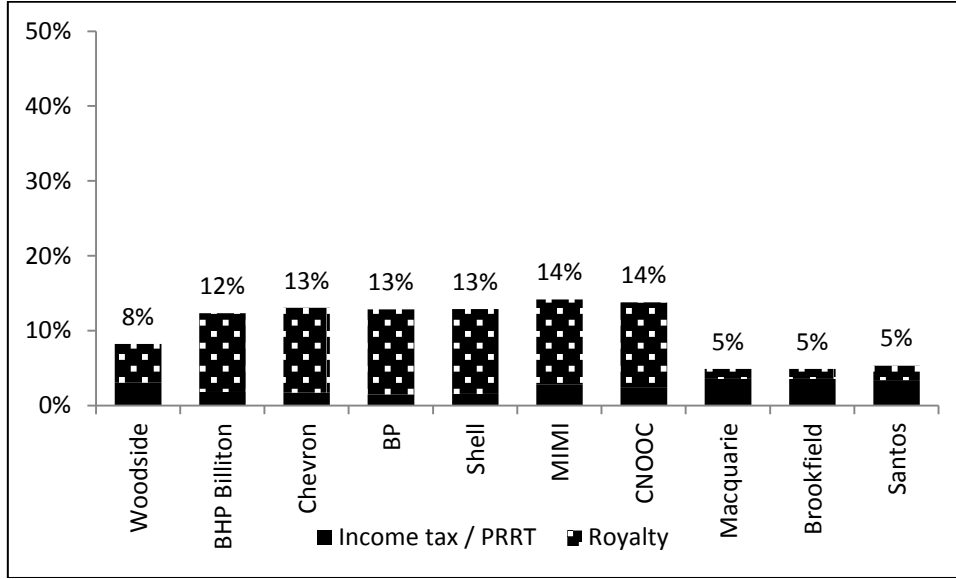


Source: Authors' calculations
 Note: Tax rates are estimated as a proportion of EBIT plus Royalty payments

For the NWS JV partners, average tax rates range from 30 to 45 per cent of before tax profits. The data indicates that Woodside pays a greater rate of company income tax and PRRT compared to other companies. However, its average royalty rate is lower because no royalties are charged on the Pluto project. The major foreign oil and gas companies pay a relatively low proportion of before tax profits as income tax, which may be due to the exploration activity undertaken by these companies in recent years. For companies involved in middle-sized gas projects, the main source of tax revenue is corporate income tax.

The tax revenue that accrues to Western Australians is shown in Figure 6, again, shown as effective rates on before-tax profits for each company. As discussed above, the Western Australian government receives around 65 per cent of Australian Government Royalties on the NWS, and also levies its own royalty. For Australian Government taxes, it is assumed that the proportion accruing to Western Australians is the same as the state's population share, 11 per cent (ABS 2015b).

Figure 6: Effective tax and royalty rates on profits from gas production, accruing to Western Australians, 2014



Source: Authors' calculations
Note: Tax rates are estimated as a proportion of EBIT plus Royalty payments

2.4. Share of WA gas producers' profits remaining in Australia

Australian and Western Australian households derive income from their ownership of shares in gas-producing companies as well as taxes and royalties collected by their governments. The proportion of profit that remains in Australia will be higher than just the share of the company owned by Australians, because taxes and royalties remain wholly in Australia.

The share of a company's profit that remains in Australia is calculated as follows:

$$\text{Australian share of profit} = \sum_{i=0}^n \pi_i [t_i + r_i + s_i(1 - k_i)(1 - t_i - r_i)] \quad (3)$$

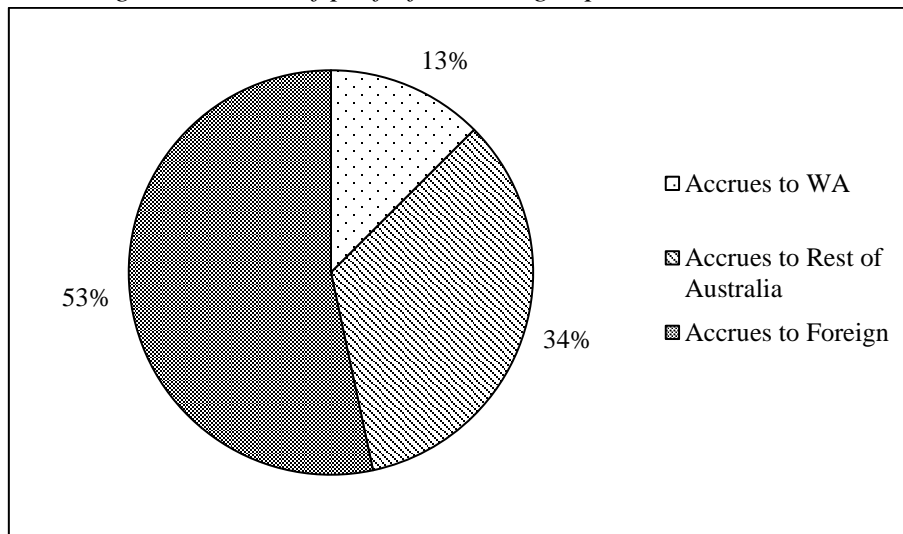
where company i pays company income tax and PRRT at a rate of t_i and royalties at a rate of r_i . The share k_i of after tax profits are paid in interest to foreign lenders. A share s_i of the remaining profits are paid to Australian equity-holders. The total Australian share of industry-wide before tax profit is then the summation of this multiplied by the company's share of total industry profit, π_i .

Western Australia's share can be calculated similarly, using the WA share rather than the Australian share where appropriate. This is shown in equation (4).

$$\text{WA Share of Profit} = \sum_{i=0}^n \pi_i [t_i^{WA} + r_i^{WA} + s_i^{WA}(1 - k_i)(1 - t_i - r_i)] \quad (4)$$

The result is that in 2014, the share of profit from gas producers that accrues to Australian households is estimated at 47 per cent and the WA share is 13 per cent, as shown in Figure 7.

Figure 7: Share of profit from WA gas production, current



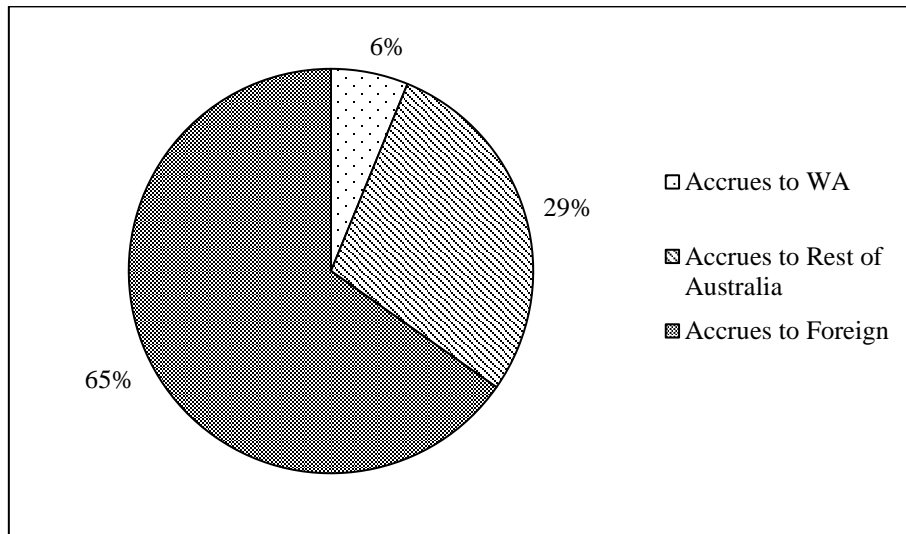
Source: Authors' calculations

Note: Tax rates are estimated as a proportion of EBIT plus Royalty payments

As new projects commence operations, the share of profits retained domestically will decline, for two reasons. As discussed in section 2.3, the projects currently under construction rely more heavily on foreign investment than existing projects. As discussed in section 2.4, tax revenues are likely to be lower for new projects because the new projects do not appear to be subject to the Australian Government Royalty.

The commencement of the Gorgon and Wheatstone projects is expected to reduce the share of profits accruing to Australians to 35 percent. The share for Western Australia falls to 8 percent. When Prelude and Ichthys also come online the shares will become 34 per cent and 7 per cent respectively, as shown in Figure 8 below. These estimates exclude any potential increases in effective income tax rates that may occur when tax deductions for depreciation and exploration expenses decline as the projects become more mature.

Figure 8: Shares of profit from WA gas production, all projects operational



Source: Authors' calculations

Note: Uses historical effective tax rates, estimated as a proportion of EBIT plus Royalty payments

3. Gas Consumption

This section investigates the shares of profits from gas consumption in WA that are retained within Australia and the State. After identifying the large gas consumers in the state (section 3.1), we investigate their level of foreign ownership (section 3.2). While the share of after tax profits flowing to domestic owners of these companies is higher than for the production side of the market, after taking tax payments into account, we show that the Australian share of before tax profits from gas consumption is similar to the share from gas production.

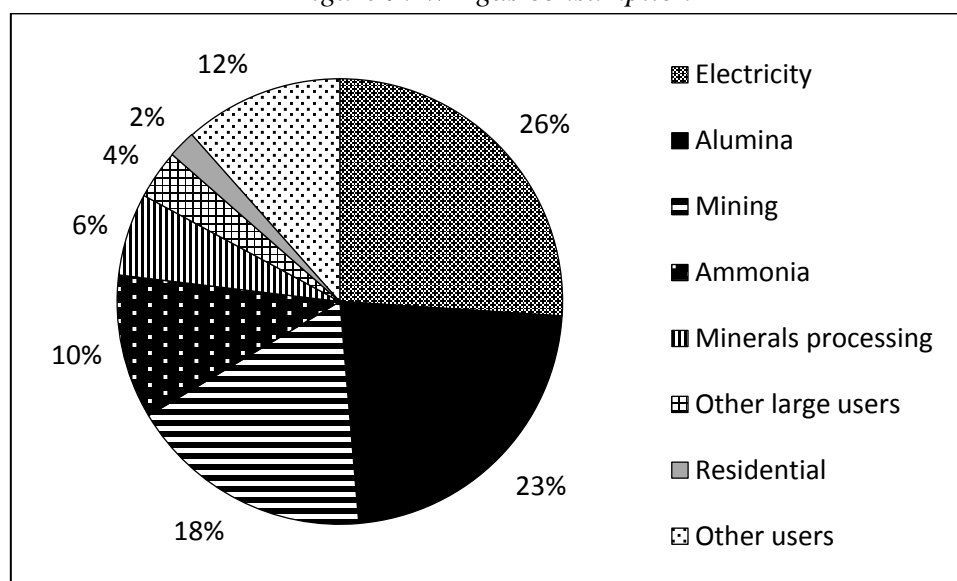
3.1 WA gas use by company

In 2014, 366 PJ of natural gas was produced for the domestic market in 2014 (WA DMP, 2014), or 24 percent of total production. Taking into account pipeline losses¹⁶, 2014 gas consumption is estimated at 359 PJ.

Large domestic gas users located within WA report their daily gas consumption to the Independent Market Operator (IMO), which publishes this data on the Gas Bulletin Board (GBB 2015). Total consumption from the 36 facilities reporting in 2014 was 310 PJ, or 86 per cent of the State's total gas consumption. Thus, this data gives good coverage of the demand side of the State's gas market.

¹⁶ Estimates of pipeline losses are based on Core Energy Group (2013), adjusted to take into account distance travelled along the Dampier to Bunbury pipeline to reach Perth.

Figure 9: WA gas consumption



Source: GBB 2015

Alcoa of Australia is the state’s largest gas consumer – its three alumina facilities account for 23 per cent of WA gas consumption, as shown in Figure 9 above. Together, 13 different electricity generators use 26 percent of WA domestic gas. Mining operations use 18 per cent, and two ammonia plants use 10 per cent. Less than 2 percent of gas use in Western Australia was for residential purposes (BREE 2014). Details on the largest individual gas-using facilities are tabulated below.

Table 4: WA’s largest gas consumers

Company	Facility	2014 Consumption	
		PJ	%
Alcoa	Alcoa Pinjarra	30.3	8.5%
Yara Pilbara Holdings	Yara Pilbara Liquid Ammonia Plant	28.4	7.9%
Alcoa	Alcoa Wagerup	26.0	7.2%
Alcoa	Alcoa Kwinana	24.8	6.9%
Alinta	Pinjarra Cogeneration	22.8	6.4%
South32, Japan Alumina, Sojitz Alumina	Worsley Alumina	18.6	5.2%
ICG, Sumitomo	NewGen Kwinana CCG1	16.6	4.6%
Synergy, Origin Energy	Worsley Cogeneration	11.8	3.3%
Rio Tinto	Yurrali Maya Power Station	10.7	3.0%
Wesfarmers	CSBP Ammonia Prod. Fac.	9.2	2.6%
Alinta	Port Hedland Power Station	8.2	2.3%
Synergy	HEGT	7.9	2.2%
Synergy	Cockburn Power Station	7.8	2.2%
Synergy	Pinjarra Power Station	7.7	2.1%
Other large users		79.6	22.2%
Small users		41.4	11.5%
Residential		7.2	2.0%
Total		358.8	100%

Source: GBB 2015

3.2 Australian ownership of large gas users

Australian and foreign ownership shares of Western Australia’s large gas consumers are estimated in the same way as for gas producers, using a similar method to that described in section 2.2. The table below shows the estimated proportion of after tax profits that accrue to Australians and Western Australians for each company.

A key difference is that two electricity producers are wholly-owned by the WA Government: Synergy and Horizon Power. All of the profits from these corporations therefore accrue to Western Australians.

As discussed in section 2.2, it is estimated that Australians own 61 per cent of all equity issued on the ASX, and the domestic ownership of equity in each company is adjusted accordingly.

Table 5: Domestic share of after-tax profits from gas-using companies

Company	WA gov't share	debt share	equity share	share of equity ASX listed	implied Australian share	implied WA share
Alcoa	0%	6%	94%	40%	24%	3%
Alinta	0%	74%	26%	0%	0%	0%
Synergy	100%	NA	NA	NA	100%	100%
Yara Pilbara Holdings Ltd	0%	44%	56%	0%	0%	0%
South32, Japan Alumina Associates, Sojitz Alumina	0%	63%	37%	74%	36%	4%
ICG, Sumitomo	0%	35%	65%	50%	27%	3%
Wesfarmers	0%	23%	77%	100%	56%	6%
Rio Tinto	0%	6%	94%	17%	10%	1%
BHP Billiton	0%	24%	76%	50%	28%	3%
RATCH	0%	73%	27%	20%	9%	1%
TransAlta	0%	30%	70%	17%	10%	1%
Newcrest	0%	12%	88%	100%	58%	6%
Citic Pacific Mining	0%	25%	75%	0%	0%	0%
Origin Energy	0%	20%	80%	100%	57%	6%
Horizon Power	100%	NA	NA	NA	100%	100%
Glencore	0%	23%	77%	0%	0%	0%
EDL LNG	0%	70%	30%	100%	47%	5%
BP	0%	39%	61%	0%	0%	0%
Fortescue	0%	35%	65%	100%	54%	6%

Source: See Table A3 in the appendix.

In contrast to gas-producing companies, gas-consuming companies are not likely to issue all of their debt overseas. According to ABS data, 33 per cent of debt issued by Australian-based companies is owned by foreign investors. In line with this, 67 per cent of interest payments

by Australian-listed companies are assumed to flow to Australians. Foreign-listed companies are assumed to issue their debt overseas, and those listed on more than one stock exchange issue domestic debt in proportion to their ASX listing.

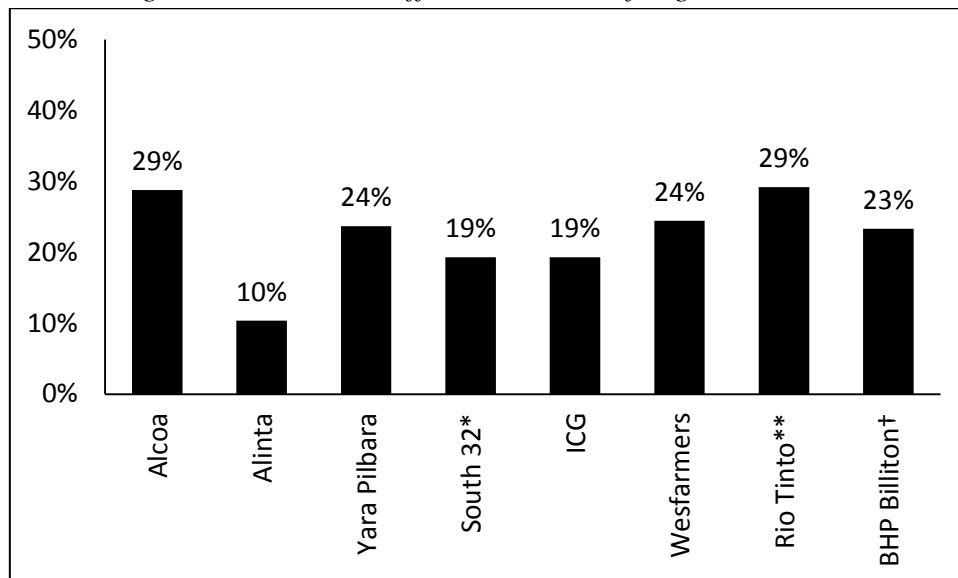
Again, WA ownership is found by scaling the domestic ownership share in line with WA's share of national population (around 11 percent).

3.3 Taxes on gas users

In contrast to gas producers, the key tax paid by gas-using companies is company income tax. The effective tax rate paid by gas consuming companies is again estimated using Company 360 data, which includes data for companies comprising 82 percent of the large gas consumers identified in the GBB data. In all cases, information from Australian subsidiaries are used and, in some cases, very specific data was available¹⁷. Information is not available for ICG and Sumitomo, which jointly own electricity generation plants, so we apply the average tax rate for other gas users, of 19 per cent.

Figure 10 shows the effective tax rate, as a proportion of profits before interest and tax (EBIT), for key gas consumers in the state. Comparing this chart of Figure 5 shows that gas producers generally pay a higher effective tax rate, due to royalties and PRRT.

Figure 10: Estimated effective tax rates for gas consumers



Source: ATO 2015

Note: *South32 Aluminium (Worsley) Pty Ltd, **Hamersley Iron Pty. Limited, †BHP Billiton Minerals Pty Ltd

¹⁷ For example, data was used for South32 Aluminium (Worsley) Pty Ltd, Hamersley Iron Pty. Limited (Rio Tinto), BHP Billiton Minerals Pty Ltd.

Western Australian residents are assumed to benefit from 11 percent of these Australian Government revenues, reflecting WA’s population share (ABS 2015b).

Electricity generators Synergy and Horizon power are owned by the State Government and pay an ‘income tax equivalent’ to the WA Treasury, rather than paying income tax to the Australian Government. Therefore, all revenue from these Government-owned entities belongs to the WA Government.

3.4 Share of WA gas users’ profits remaining in Australia

Australian households derive income from their share of the profits of gas-consuming firms and from tax revenues. They also derive benefits from directly consuming gas.

The overall share of these benefits should take into account both the relative size of each gas-using company and the relative importance of gas as an input to each company’s production. Thus, the proportion before tax profits accruing to Australian households from each gas company is weighted by its share of state gas consumption¹⁸. The overall share of before tax profits WA gas users that flows to Australian households is calculated as follows:

Australian share of consumption benefits

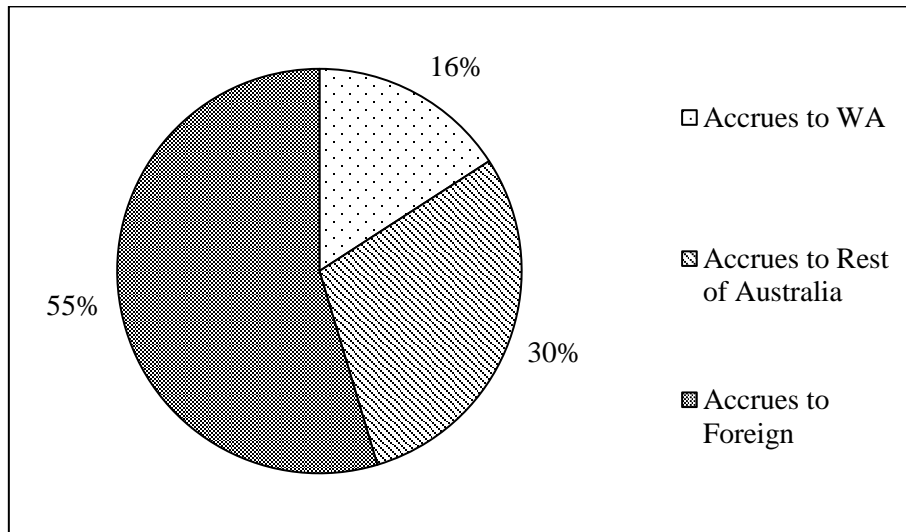
$$= \sum_{j=0}^n c_j \left[t_j + (s_j k_j w_j + s_j (1 - k_j)) (1 - t_j) \right] \quad (5)$$

where c_j refers to company j ’s share of WA gas consumption and t_j refers to its effective tax rate. After tax profits accruing to Australians depend on s_j , the share of equity owned by Australians k_j , the interest share of after-tax profits and w_j , the proportion of domestically issued debt that is owned by Australians. All of the benefits of direct gas consumption by Western Australian households are assumed to accrue to the consumers themselves.

Overall, 45 per cent of the benefits from gas-use in WA accrue to Australian households. Western Australian’s corresponding share is 16 percent, as shown in Figure 11.

¹⁸ This assumes that profits attributable to each company’s consumption of gas are proportional to this consumption.

Figure 11: Shares of before tax profit from WA gas use

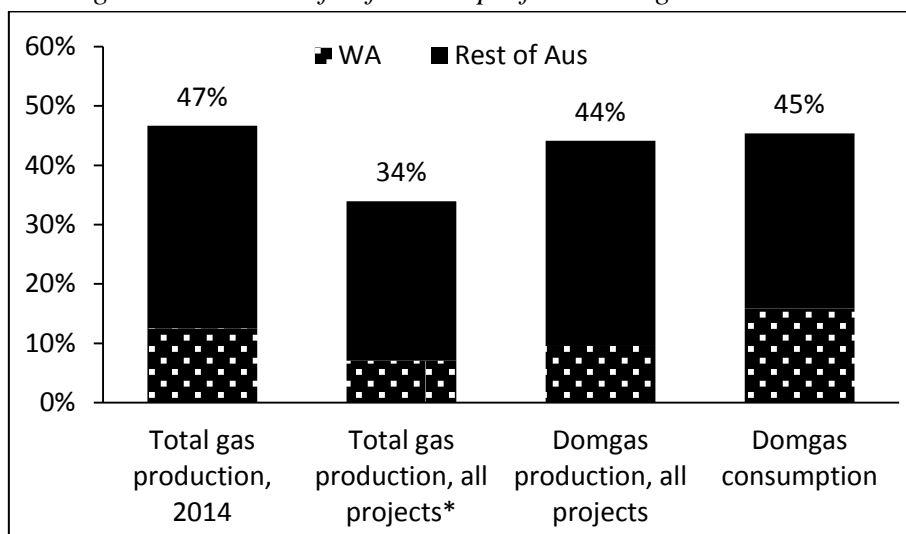


Source: Authors' calculations

4. Conclusions and policy relevance

Australians benefit substantially from the development of domestic gas resources. Specifically, Australians received around 47 percent of before-tax profits from gas production in WA in 2014, as shown in Figure 12. This proportion is high partly because of the involvement of a number of Australian-listed companies in WA gas production. In addition, gas producers pay taxes, such as royalties and PRRT, that are considered to be compensation for allowing the depletion of natural resources. Australian and WA royalties contribute 13 percentage points to the 47 percent of before-tax profits remaining in Australia.

Figure 12: Shares of before-tax profit accruing to Australians



Source: Authors' calculations

* excludes potential PRRT payments from new projects

The importance of foreign investment to Australia's economy is demonstrated in WA's gas industry. The four projects commencing operation in coming years – Gorgon, Wheatstone, Prelude and Ichthys – rely heavily on foreign investment. With these new projects online, the proportion of profits remaining in Australia is likely to be around 34 per cent.

Understanding the share of profits that accrue to Australian and Western Australian residents, including tax payments to governments, is important for gauging the contribution of the industry to domestic living standards. By focussing on this share, this paper has helped to correct an important omission from other papers.

A limitation of this study is that we have not considered the effect of the construction phase for gas-producing projects (or gas-using projects). Openness to foreign investment enables the construction of large gas-producing facilities that may not otherwise go ahead. The construction phase of WA's new gas projects is known to have generated additional employment and economic activity in the state. A full study of the benefits of gas production would take this into account, and likely find greater benefits for Australian and Western Australian households than estimated in this paper. We leave this question for future research, and instead, have focussed on the flow of profits that act as payments for the foreign investment in the domestic industry.

Around 45 per cent of the benefits of gas *consumption* in WA accrues to Australians. Only a very small proportion (2 per cent) of gas is consumed directly by households. Government-owned electricity generators account for an additional 10 per cent of WA's gas consumption. While issues relating to government ownership of utilities are not addressed in this paper, if these electricity generators were operated privately, the Australian share of benefits from electricity consumption would likely be smaller.

The estimates presented in this paper can be useful in evaluating government policies that affect WA's gas industry. For example, the WA government usually requires gas exporters to supply the equivalent of 15 per cent of their LNG exports to the WA market, under the domestic gas reservation policy. This additional supply to the domestic market suppresses the market price, acting as a subsidy to gas consumers and a tax on gas producers. Some studies, including ACIL Allen (2014) and ERA (2014), raise the question of foreign ownership in this context. They note that if foreign ownership of gas producers is higher than for gas consumers, then the reservation policy might be thought of as a transfer of income from foreign gas-producing firms to domestic gas-consuming firms. In the absence of reliable

estimates, both studies leave this question to future research. The detailed data compiled for this paper shows that the policy should not be considered as a transfer from foreign to domestic investors. In particular, once the new Gorgon and Wheatstone domestic supply facilities are operational 44 per cent of before-tax profits from domestic gas production accrues to Australians, which is similar to the share for consumers of WA domestic gas.

This paper has also provided information that can be used to evaluate the extent of market power in the WA gas market. On the supply side, the data shows that the NWS project dominates current domestic gas supply, but that the project's share will fall with the commencement of the Gorgon and Wheatstone projects. While the number of companies participating in the gas market is larger than the number of projects, the data compiled for this project shows that Woodside is currently the most important player, accounting for 30 per cent of the state's overall gas production and 24 per cent of domestic gas production. The demand side has an equally large player, with Alcoa consuming 23 per cent of the gas used within the state. This information can be helpful to policy decisions aimed at improving the level of competition on the WA gas market.

The Australian government also monitors foreign investment due to concerns about national interest and national security (Treasury 2015). For example, the Australian Government intervened in 2001, when Shell attempted a hostile takeover of Woodside. The move was blocked on grounds of 'national interest' (Treasury 2001). Although not explicit, it appears that a public preference for domestic ownership of gas extraction companies could have been a contributing factor to this decision. Recent free trade agreements (FTAs) with major trading partners, including the U.S. and China, raise the threshold for government approval to over \$1 billion. Some of the smaller WA gas producers, and shares of the larger projects, fall within the threshold, meaning that foreign entities are able to buy out these companies or shares with no assessment from the Australian government. The results in this paper may assist analysis by the Foreign Investment Review Board by providing a picture of the foreign ownership of the industry as a whole.

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6. Appendix

Table A1: Sources for project shares (company websites)

Project	Source
Gorgon	https://www.chevronaustralia.com/our-businesses/gorgon
Wheatstone	https://www.chevronaustralia.com/our-businesses/wheatstone
Pluto	http://www.appea.com.au/oil-gas-explained/operation/australian-lng-projects/
NWS	http://www.appea.com.au/oil-gas-explained/operation/australian-lng-projects/
Prelude	http://www.shell.com/about-us/major-projects/prelude-flng/prelude-flng-an-overview.html
Ichthys	http://www.inpex.com.au/media/1104/18_12_2012_ichthys_lng_project_completes_project_financing_arrangements.pdf
Macedon	http://www.bhpbilliton.com/~media/bhp/documents/businesses/petroleum_potash/150514_petroleumpotash_petroleum_bhpbfactsheetsmacedon.pdf?la=en
Devil Creek	https://www.santos.com/what-we-do/activities/western-australia/carnarvon-basin/reindeer/
Varanus Island	
John Brookes	https://www.santos.com/what-we-do/activities/western-australia/carnarvon-basin/john-brookes-spar/
Harriet	https://www.santos.com/media/1987/080624-john-brookes-production-interruption-update-combined.pdf http://investor.apachecorp.com/releasedetail.cfm?releaseid=230350 http://www.asx.com.au/asxpdf/20120213/pdf/4249kv8s5x7nwr.pdf
Athena	http://www.conocophillips.com/investor-relations/company-reports/Documents/PDF/Fact%20Sheet_APME_Spring%202015_FINAL.pdf
Dongara	https://www.santos.com/what-we-do/activities/western-australia/carnarvon-basin/john-brookes-spar/
Beharra Springs	https://www.santos.com/media/1987/080624-john-brookes-production-interruption-update-combined.pdf
Red Gully gas plant	http://www.conocophillips.com/investor-relations/company-reports/Documents/PDF/Fact%20Sheet_APME_Spring%202015_FINAL.pdf
Xyris	http://www.asx.com.au/asxpdf/20150821/pdf/430pfxmjj8r0nh.pdf
Woodada	http://www.awexplore.com/irm/content/onshore-perth-basin1.aspx?RID=402
Corybas	http://www.asx.com.au/asxpdf/20150731/pdf/43057vlt808nn0.pdf

Table A2: Sources for stock exchange listings of gas-producing companies (company websites)

Company	Source
Chevron	http://investor.chevron.com/phoenix.zhtml?c=130102&p=irol-irhome
Shell	http://www.shell.com/investors.html#iframe-L1NvbHV0aW9ucy9TaGVsbC8yMDg4L21pbmlxdW90ZTIuYXNweA==
ExxonMobil	http://ir.exxonmobil.com/phoenix.zhtml?c=115024&p=irol-stockQuote
Inpex	http://www.inpex.co.jp/english/ir/index.html
Woodside	http://www.woodside.com.au/Investors-Media/Shareholders-Services/Pages/default.aspx#.VqXH2FLmOF8
TOTAL	http://www.total.com/en/investors/institutional-investors/presentations
BP	http://www.bp.com/en/global/corporate/investors.html
BHP Billiton	http://www.bhpbilliton.com/investors/shareholderinfo
Macquarie	http://www.macquarie.com/au/about/investors
Brookfield	http://www.brookfield.com/content/stock_and_dividend_info/common_shares-26718.html
MIMI	http://www.mitsubishicorp.com/jp/en/ir/
	https://www.mitsui.com/jp/en/ir/information/basic/index.html
Kufpec	http://www.kufpec.com/Reports/KUFPEC%20Financial%20Reports/fanancial2014.pdf
Santos	https://www.santos.com/investors/shareholder-information/
Tokyo Gas Co	http://www.tokyo-gas.co.jp/IR/english/stockprice_e.html
Eni	http://www.eni.com/en_IT/investor-relation/eni-stock-markets/eni-stock.shtml
CNOOC	http://www.cnooltd.com/col/col7391/index.html
Osaka Gas	http://www.osakagas.co.jp/en/ir/index.html
Tokyo EP (TEPCO?)	http://www.tepco.co.jp/en/corpinfo/ir/stock/stock-e.html
CPC	http://en.cpc.com.tw/glance_content.aspx
Kogas	http://www.kogas.or.kr/en/investors/quote/quote.action
Kansai Electric	http://www.kepco.co.jp/english/siteinfo/faq/biz_and_ir/9990628_16151.html
Chubu Electric Power	http://www.chuden.co.jp/english/ir/eir_stockinformation/esto_stockperformance/index.html
Kyushu Electric Power	http://www.kyuden.co.jp/en_ir_stock_information.html
ConocoPhillips	http://www.conocophillips.com/investor-relations/stock-information/Pages/default.aspx
Central Petroleum	http://www.asx.com.au/asx/research/company.do#!/ctp
Toho Gas	http://www.tohogas.co.jp/lang/en/corporate/stock-info/basic-date/
Origin Energy	https://www.originenergy.com.au/about/investors-media/share-price.html
AWE	http://www.awexplore.com/irm/content/investor-information.aspx?RID=365
Empire Oil and Gas	http://empireoil.com.au/asx_announcements
ERM Power	http://www.ermpower.com.au/investor-centre/asx-announcements/
PetroChina	http://www.petrochina.com.cn/ptr/tzzgx/tzzgx.shtml
OPIC	https://www.opic.gov/

Table A3: Sources for stock exchange listings of gas-users (company websites)

Company	Source
Alcoa	http://www.alcoa.com/global/en/investment/invest_faq.asp
BP	http://www.bp.com/en/global/corporate/investors.html
Wesfarmers	http://www.csbp.com.au/Home.aspx
Synergy	http://generation.synergy.net.au/generating-electricity/power-stations https://www.finance.wa.gov.au/cms/Public_Utility_Office/Energy_Initiatives/Merger_of_Synergy_and_Verve_Energy.aspx
Horizon Power	http://horizonpower.com.au/about-us/overview/who-we-are/
RATCH	http://ratchaustralia.com/about/about_company_background.html
BHP Billiton	http://www.kic.org.au/industry/kic-members/bhp-billiton-nickel-west.html
EDL LNG	http://www.energydevelopments.com.au/01_cms/PublicDocuments/20040705_ENE_WesternPowerPPAforWKPP_146186.pdf
BHP Billiton	http://www.kic.org.au/industry/kic-members/bhp-billiton-nickel-west.html
Glencore	http://www.minara.com.au/about/operations-overview
ICG, Sumitomo	http://newgenpowerkwinana.com.au/aboutus.html
ICG, Sumitomo	http://www.infrastructurecapital.com.au/kwinana-power-station/
Alinta	https://alintaenergy.com.au/wa/about-us/about-alinta-energy
Rio Tinto	http://www.riotinto.com/documents/201509_RT_Chartbook.pdf
Synergy	http://generation.synergy.net.au/generating-electricity/power-stations
Citic Pacific Mining	http://www.citicpacificmining.com/about/citic-limited/
TransAlta	http://www.imowa.com.au/docs/default-source/market-participants/gsi-notice---19-07-2013.pdf?sfvrsn=4
Newcrest	http://www.newcrest.com.au/investors/company-summary
South32	https://www.south32.net/CMSPages/GetFile.aspx?guid=3422a937-e347-4fd0-bf7c-551fb5caa2f9
Japan Alumina Associates	http://www.itochu.com.au/metals_mineral.html
Sojitz Alumina	http://www.sojitz.com/en/ir/stkholder/stock/
Yara Pilbara Holdings	http://yara.com/investor_relations/share_information/

Table A4: Estimated share of WA gas producers' profits remaining in Australia

Company	Income tax rate, t	Royalty rate, r	Interest share of after tax profits, k	Equity share of after tax profits, (1-k)	Aus share of equity holders, s	Aus share of firm before tax profits	WA share of firm before tax profits
	Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7
Chevron	18.8%	0.0%	10.6%	89.4%	0.0%	18.8%	2.0%
Chevron (NWS)	16.1%	16.5%	10.6%	89.4%	0.0%	32.5%	13.1%
Shell	16.7%	0.0%	20.7%	79.3%	0.0%	16.7%	1.8%
Shell (NWS)	14.6%	16.5%	20.7%	79.3%	0.0%	31.1%	12.9%
ExxonMobil	38.2%	0.0%	30.7%	69.3%	0.0%	38.2%	4.2%
ExxonMobil (VI)	36.8%	1.9%	30.7%	69.3%	0.0%	38.8%	5.9%
Inpex	35.3%	0.0%	0.0%	100.0%	0.0%	35.3%	3.9%
Woodside	30.6%	0.0%	4.5%	95.5%	61.0%	71.0%	7.7%
Woodside (NWS)	25.6%	16.5%	4.5%	95.5%	61.0%	75.8%	17.8%
TOTAL	32.4%	0.0%	0.0%	100.0%	0.0%	32.4%	3.5%
BP (NWS)	14.0%	16.5%	38.6%	61.4%	0.0%	30.4%	12.9%
BHP Billiton	19.0%	0.0%	11.0%	89.0%	14.6%	29.5%	3.2%
BHP (NWS)	16.9%	16.5%	11.0%	89.0%	14.6%	42.0%	14.1%
Macquarie	33.6%	0.0%	31.9%	68.1%	61.0%	61.2%	6.7%
Macquarie (VI)	33.1%	1.9%	31.9%	68.1%	61.0%	62.0%	8.5%
Brookfield	33.6%	0.0%	31.9%	68.1%	0.0%	33.6%	3.7%
Brookfield (VI)	33.1%	1.9%	31.9%	68.1%	0.0%	35.0%	5.5%
MIMI (NWS)	26.2%	16.5%	1.1%	98.9%	0.0%	42.7%	14.2%

Company	Income tax rate, t	Royalty rate, r	Interest share of after tax profits, k	Equity share of after tax profits, (1-k)	Aus share of equity holders, s	Aus share of firm before tax profits	WA share of firm before tax profits
Kufpec	40.8%	0.0%	33.2%	66.8%	0.0%	40.8%	4.4%
Kufpec (VI)	39.7%	1.9%	33.2%	66.8%	0.0%	41.6%	6.3%
Santos	31.9%	0.0%	17.1%	82.9%	61.0%	66.4%	7.2%
Santos (VI)	31.4%	1.9%	17.1%	82.9%	61.0%	67.1%	9.0%
Tokyo Gas Co	13.3%	0.0%	58.7%	41.3%	0.0%	13.3%	1.4%
CNOOC (NWS)	22.8%	16.5%	19.3%	80.7%	0.0%	39.3%	13.8%
Osaka Gas	28.6%	0.0%	19.3%	80.7%	0.0%	28.6%	3.1%
Tokyo EP	28.6%	0.0%	19.3%	80.7%	0.0%	28.6%	3.1%
CPC	28.6%	0.0%	19.3%	80.7%	0.0%	28.6%	3.1%
Kogas	28.6%	0.0%	19.3%	80.7%	0.0%	28.6%	3.1%
Kansai Electric	30.1%	0.0%	29.1%	70.9%	0.0%	30.1%	3.3%
Chubu Electric Power	28.6%	0.0%	19.3%	80.7%	0.0%	28.6%	3.1%
Kyushu Electric Power	28.6%	0.0%	19.3%	80.7%	0.0%	28.6%	3.1%
ConocoPhillips (VI)	40.4%	1.9%	11.1%	88.9%	0.0%	42.3%	6.3%
Toho Gas	28.6%	0.0%	19.3%	80.7%	0.0%	28.6%	3.1%
Origin Energy	8.3%	18.3%	20.3%	79.7%	61.0%	62.3%	23.1%
AWE	37.0%	18.3%	9.2%	90.8%	61.0%	80.1%	25.0%
Empire Oil and Gas	23.4%	18.3%	19.3%	80.7%	61.0%	70.4%	24.0%
OPIC	28.6%	0.0%	19.3%	80.7%	0.0%	28.6%	3.1%
Total							

Table A4 Continued: Estimated share of WA gas producers' profits remaining in Australia

Company	2014 Outcome			Outcome after Gorgon and Wheatstone			Outcome after all projects operational		
	Firm's share of total WA gas profits	Aus share of industry before tax profits	WA share of industry before tax profits	Firm's share of total WA gas profits	Aus share of industry before tax profits	WA share of industry before tax profits	Firm's share of total WA gas profits	Aus share of industry before tax profits	WA share of industry before tax profits
		Col 6 *	Col 7 *		Col 6 *	Col 7 *		Col 6 *	Col 7 *
	Col 8	Col 8	Col 8	Col 11	Col 11	Col 11	Col 14	Col 14	Col 14
Chevron	0.0%	0.0%	0.0%	29.7%	5.6%	0.6%	24.7%	4.6%	0.5%
Chevron (NWS)	12.7%	4.1%	1.7%	6.7%	2.2%	0.9%	5.5%	1.8%	0.7%
Shell	0.0%	0.0%	0.0%	10.1%	1.7%	0.2%	15.1%	2.5%	0.3%
Shell (NWS)	13.9%	4.3%	1.8%	7.3%	2.3%	0.9%	6.1%	1.9%	0.8%
ExxonMobil	0.0%	0.0%	0.0%	2.4%	0.9%	0.1%	2.0%	0.8%	0.1%
ExxonMobil (VI)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Inpex	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.5%	2.3%	0.3%
Woodside	15.1%	10.8%	1.2%	10.2%	7.3%	0.8%	8.5%	6.0%	0.7%
Woodside (NWS)	12.7%	9.6%	2.3%	6.7%	5.1%	1.2%	5.5%	4.2%	1.0%
TOTAL	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.7%	0.9%	0.1%
BP (NWS)	8.9%	2.7%	1.1%	4.7%	1.4%	0.6%	3.9%	1.2%	0.5%
BHP Billiton	1.3%	0.4%	0.0%	0.7%	0.2%	0.0%	0.6%	0.2%	0.0%
BHP (NWS)	16.0%	6.7%	2.3%	8.4%	3.5%	1.2%	7.0%	2.9%	1.0%
Macquarie	0.2%	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%
Macquarie (VI)	0.5%	0.3%	0.0%	0.3%	0.2%	0.0%	0.2%	0.1%	0.0%

Company	2014 Outcome			Outcome after Gorgon and Wheatstone			Outcome after all projects operational		
	Firm's share of total WA gas profits	Aus share of industry before tax profits	WA share of industry before tax profits	Firm's share of total WA gas profits	Aus share of industry before tax profits	WA share of industry before tax profits	Firm's share of total WA gas profits	Aus share of industry before tax profits	WA share of industry before tax profits
Brookfield	0.2%	0.1%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%
Brookfield (VI)	0.5%	0.2%	0.0%	0.3%	0.1%	0.0%	0.2%	0.1%	0.0%
MIMI (NWS)	13.3%	5.7%	1.9%	7.0%	3.0%	1.0%	5.8%	2.5%	0.8%
Kufpec	0.0%	0.0%	0.0%	1.0%	0.4%	0.0%	0.9%	0.4%	0.0%
Kufpec (VI)	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Santos	0.2%	0.1%	0.0%	0.1%	0.1%	0.0%	0.1%	0.1%	0.0%
Santos (VI)	0.4%	0.3%	0.0%	0.2%	0.1%	0.0%	0.2%	0.1%	0.0%
Tokyo Gas Co	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.1%	0.0%
CNOOC (NWS)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%	0.5%	0.2%
Osaka Gas	2.4%	0.7%	0.1%	1.3%	0.4%	0.0%	0.3%	0.1%	0.0%
Tokyo EP	0.0%	0.0%	0.0%	0.3%	0.1%	0.0%	0.9%	0.3%	0.0%
CPC	0.0%	0.0%	0.0%	1.0%	0.3%	0.0%	0.2%	0.1%	0.0%
Kogas	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.2%	0.0%
Kansai Electric	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Chubu Electric Power	0.6%	0.2%	0.0%	0.3%	0.1%	0.0%	0.1%	0.0%	0.0%
Kyushu Electric Power	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.2%	0.0%	0.0%
ConocoPhillips (VI)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Company	2014 Outcome			Outcome after Gorgon and Wheatstone			Outcome after all projects operational		
	Firm's share of total WA gas profits	Aus share of industry before tax profits	WA share of industry before tax profits	Firm's share of total WA gas profits	Aus share of industry before tax profits	WA share of industry before tax profits	Firm's share of total WA gas profits	Aus share of industry before tax profits	WA share of industry before tax profits
Toho Gas	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Origin Energy	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
AWE	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Empire Oil and Gas	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
OPIC	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.1%	0.0%
Total	100.0%	46.7%	12.5%	100.0%	35.3%	7.8%	100.0%	34.0%	7.1%

Source: Authors' calculations, as described in the main body of the paper.

Note: North West Shelf (NWS) and Varanus Island (VI) participants are separately identified in this table because these projects attract different royalty rates.

Table A5: Estimated share of WA gas users' profits remaining in Australia

Company	Tax rate, t	Interest share of after tax profits, k	Equity share of after tax profits, (1-k)	Aus share of equity holders, s	Aus share of firm before tax profits	WA share of firm before tax profits	Firm's share of total WA gas use	Aus share of industry before tax profits	WA share of industry before tax profits
	Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 5 * Col 7	Col 6 * Col 7
Alcoa	28.8%	6.0%	94.0%	24.4%	45.8%	5.0%	22.6%	10.4%	1.13%
Alinta	10.4%	73.7%	26.3%	0.0%	10.4%	1.1%	10.3%	1.1%	0.12%
Synergy	0.0%	0.0%	100.0%	100.0%	100.0%	100.0%	8.8%	8.8%	8.76%
Yara Pilbara Holdings Ltd	23.7%	43.8%	56.2%	0.0%	23.7%	2.6%	7.9%	1.9%	0.20%
South32 Japan Alumina Associates & Sojitz Alumina	19.3%	63.0%	37.0%	45.2%	48.2%	5.2%	5.2%	2.5%	0.27%
ICG, Sumitomo	19.3%	34.8%	65.2%	30.5%	41.1%	4.5%	5.1%	2.1%	0.23%
Wesfarmers	24.5%	23.0%	77.0%	61.0%	67.0%	7.3%	5.1%	3.4%	0.37%
Rio Tinto	29.2%	5.7%	94.3%	10.1%	36.2%	3.9%	4.5%	1.6%	0.18%
BHP Billiton	23.3%	24.3%	75.7%	30.6%	44.9%	4.9%	2.9%	1.3%	0.14%
RATCH	12.5%	73.0%	27.0%	12.2%	20.6%	2.2%	2.3%	0.5%	0.05%
TransAlta	21.7%	30.3%	69.7%	10.6%	29.2%	3.2%	2.1%	0.6%	0.07%
Newcrest	24.8%	12.4%	87.6%	61.0%	68.8%	7.5%	2.0%	1.4%	0.15%
Citic Pacific Mining	13.9%	24.8%	75.2%	0.0%	13.9%	1.5%	2.0%	0.3%	0.03%
Origin Energy	12.1%	20.3%	79.7%	61.0%	62.1%	6.8%	1.6%	1.0%	0.11%

Company	Tax rate, t	Interest share of after tax profits, k	Equity share of after tax profits, (1-k)	Aus share of equity holders, s	Aus share of firm before tax profits	WA share of firm before tax profits	Firm's share of total WA gas use	Aus share of industry before tax profits	WA share of industry before tax profits
Horizon Power	0.0%	0.0%	100.0%	100.0%	100.0%	100.0%	1.5%	1.5%	1.49%
Glencore	20.1%	23.1%	76.9%	0.0%	20.1%	2.2%	1.4%	0.3%	0.03%
EDL LNG	7.5%	69.9%	30.1%	61.0%	50.9%	5.5%	0.8%	0.4%	0.05%
BP	17.5%	38.6%	61.4%	0.0%	17.5%	1.9%	0.2%	0.0%	0.00%
Fortescue	19.4%	34.6%	65.4%	61.0%	62.9%	6.9%	0.0%	0.0%	0.00%
Residential	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	2.0%	2.0%	2.00%
Other users	22.0%	31.5%	68.5%	22.4%	37.7%	4.1%	11.5%	4.4%	0.47%
Total							100.0%	45.4%	15.85%

Source: Authors' calculations, as described in the main body of the paper.

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