

# Petroleum Resource Rent Tax Gas Transfer Pricing Review

*Australians are being short changed by the LNG industry and the way it is taxed. A shift in the way the PRRT estimates transfer prices between a project's upstream extraction and downstream liquefaction to 'netback only' pricing, could increase revenue by \$89 billion between 2023 and 2050.*

Rod Campbell  
June 2019

## INTRODUCTION

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The Australia Institute welcomes the opportunity to make a submission to the review of transfer pricing arrangements under the Petroleum Resource Rent Tax (PRRT). The concerns raised in our submission to the Callaghan Review remain relevant in 2019 – despite becoming a major liquified natural gas (LNG) exporter, Australians receive little benefit for the large volumes of gas we export. Taxes applied to oil and gas development in Australia are far lower than countries such as Norway, Malaysia or Saudi Arabia. PRRT revenues have been declining.

The Callaghan Review missed opportunities to increase the return to Australians from the sale of hydrocarbon resources. However, its recommendation to review gas transfer pricing methodologies provides a chance to generate considerable revenue - \$89 billion between 2023 and 2050, according to the Review's modelling, with a \$68 billion increase between 2027 and 2039.<sup>1</sup>

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<sup>1</sup> Treasury (2017) *Petroleum Resource Rent Tax Review*, <https://treasury.gov.au/consultation/c2019-t364690>, p 91

# GAS TRANSFER PRICING

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The change that would bring this benefit to Australians involves the method by which the price of the gas is derived. In particular, the 'price' of the gas as it is transferred from the extractive process, the getting the gas out of the Earth's crust, over to the process that turns the gas into a liquid that can be put on a ship and sold. This is known as 'transfer pricing'.

For most of Australia's largest gas projects, transfer pricing occurs within the one entity. It is not sold between separate 'upstream' extracting businesses and 'downstream' processing businesses. Because there is no clear sale and no clear price, various methods have been derived to estimate it.

The current default method is known as the residual pricing method (RPM). The RPM actually estimates two prices – the netback price and the cost plus price. The netback price is the price of processed LNG, which is relatively well-known, less the operating and capital costs of the liquefaction process, including a capital 'allowance' of the long term government bond rate (LTBR) plus seven percent. The cost plus price is the operating and capital costs of extracting the gas, plus LTBR +7% capital allowance.

The difference between these two prices per unit of gas is economic rent. Economic rent is any payment that exceeds what is required to compensate the producer, or owner of the resource, for the effort and investment they have put into production. Because companies receiving resource rents have already covered their costs and received the necessary return on capital, the resource rents can be taxed at very high rates without disincentivising investment in the activity. In short, any rent-generating activity that was worth a company's effort before rent taxation, will still be worth the company's time after taxation, no matter what the rate.

From an Australian taxpayers' perspective, we should tax as much as possible of the economic rent generated by the extraction of the nation's gas resources. Yet the RPM considers the 'transfer price' to be half way between the netback price and the cost plus price. This gives away half the rent for free and taxes the remaining half at the internationally-low level of 40%.

The 50:50 split of rent between the upstream and downstream parts of the same business has no economic or logical justification. Instead, PRRT should be levied on a netback only basis, efficiently taxing all of the economic rent. This would effectively assume that the upstream business sells to the downstream business at the price they

are willing to pay. This option has been recommended by experts such as Monash University's Dr Diane Kraal and the Tax Justice Network.<sup>2</sup>

## CONCLUSION

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Australians are being short-changed by the gas industry and the way it is taxed. Many major projects pay no royalties and will not pay PRRT for decades, if ever, due to its many flaws. The increases in greenhouse gas emissions, and broken subsidized promises on carbon capture and storage, rub salt into the wound.<sup>3</sup> A shift to netback only transfer pricing would begin to give Australians some return for the exploitation of the nation's resources.

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<sup>2</sup> Kraal (2018) *The government could be boosting the budget bottom line with a change to how it taxes gas*, <https://theconversation.com/the-government-could-be-boosting-the-budget-bottom-line-with-a-change-to-how-it-taxes-gas-95782>; Tax Justice Network Australia (2019) [https://treasury.gov.au/sites/default/files/2019-03/C2017\\_T211950\\_Tax-Justice-Network-Australia.pdf](https://treasury.gov.au/sites/default/files/2019-03/C2017_T211950_Tax-Justice-Network-Australia.pdf)

<sup>3</sup> Swann (2018) *Gorgon-tuan Problem*, <http://www.tai.org.au/content/gorgon-tuan-problem>; Moreton (2018) *Half of Australia's emissions increase linked to WA's Gorgon LNG plant* <https://www.theguardian.com/environment/2018/nov/14/half-of-australias-emissions-increase-linked-to-was-gorgon-lng-plant>

# Scientific inquiry into Hydraulic Fracturing in the Northern Territory Submission

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*The development of unconventional gas in the Northern Territory would reduce energy security by linking the Territory to volatile east coast or world markets. Considerable costs could be incurred, while the benefits of royalties are likely to be modest.*

Rod Campbell  
Bill Browne  
Hannah Aulby  
April 2017



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Level 1, Endeavour House, 1 Franklin St  
Canberra, ACT 2601  
Tel: (02) 61300530  
Email: [mail@tai.org.au](mailto:mail@tai.org.au)  
Website: [www.tai.org.au](http://www.tai.org.au)

# INTRODUCTION

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The Australia Institute welcomes the opportunity to make a submission to the Scientific inquiry into hydraulic fracturing in the Northern Territory. Our submission focuses on Theme 7.7 of the Background and Issues Paper, economic impacts and also addresses other themes that the Institute has conducted research on.

## THEME 7.7 ECONOMIC IMPACTS - ENERGY SECURITY

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### *Comments on Northern Territory and east coast gas markets*

The Northern Territory has substantial supplies of conventional gas and is a small market. As a result, gas is currently cheap and available in the NT - a similar situation to what prevailed in eastern Australia for many years.

The tranquillity of the east coast gas market was broken by the construction of export LNG terminals in Gladstone, Queensland, which linked it to the world market and drove up prices. Worse still, the huge cost overruns of the export facilities, opaque market arrangements and lower than expected yields from Queensland coal seam gas fields<sup>1</sup> have seen gas prices increase to above world prices, even to the point where Australian gas can be cheaper to buy in Japan than in Australia.<sup>2</sup>

While the NT does export gas via the Darwin LNG Inpex terminal, this largely serves the offshore Bayu-Undan field, while other conventional reserves supply the NT. While this balance is maintained, NT gas supply security is unlikely to be affected. The biggest threat to security of gas supply in the Northern Territory is through potential connections to the chaos of the Eastern Australian market, or expansion of export facilities in Darwin.

The development of unconventional gas supply in the Territory would create incentive for exactly these kinds of links, presenting a risk for NT energy security. As unconventional gas is not needed to supply the local Northern Territory market, the

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<sup>1</sup> Chambers (2013) Export fears as gas wells fall short,  
<http://www.theaustralian.com.au/business/mining-energy/export-fears-as-gas-wells-fall-short/news-story/c38d5957fce9f8e34af9076d2b48c342>

<sup>2</sup> West (2017) Gas crisis? Or glut? Why Japan pays less for Australian LNG than Australians do,  
<https://theconversation.com/gas-crisis-or-glut-why-japan-pays-less-for-australian-lng-than-australians-do-74438>

proponents of unconventional projects will need infrastructure to take any production to eastern or overseas markets. Linking to these markets is unlikely to be in the interests of Territory gas consumers, exposing Territorians to volatile, higher prices and the need to compete against foreign or east coast consumers for NT gas.

### ***Surplus gas - consumption and supply in the NT***

NT gas consumption fell from 1,184 million cubic meters to 1,154 cubic meters between 2013-14 and 2014-15.<sup>3</sup> More recent data has not yet been released, but is likely to be well below earlier forecasts due to declining costs of renewable energy and abandonment of projects such as the pipeline to the Gove alumina refinery.

Power and Water Corporation (PWC) has signed long-term contracts with existing conventional gas supplies, as is made clear in its annual reports:

In 2015-16, Power and Water sourced close to 100 per cent of its natural gas from Eni Australia BV's Blacktip gas field in the Joseph Bonaparte Gulf, which lies some 110km off the Territory's northwest coast. The balance was secured from Darwin LNG pursuant to Power and Water's contingency gas supply arrangements.

The Dingo Gas Supply Agreement was concluded with Magellan Petroleum prior to the company's onshore Australian assets being purchased by Central Petroleum Limited. The agreement allowed Power and Water to coordinate the tie-in of Central Petroleum's Gas Supply pipeline into the Owen Springs Power Station for the supply of high methane content gas, which will help improve efficiency to the power station's generators.<sup>4</sup>

These conventional gas supplies are able to supply the Territory in the long term. This was the purpose of an agreement with producer Eni in 2005-06:

It is pleasing to note that in addition to the challenges faced, the Corporation delivered a number of significant achievements over the 2005-2006 year. A reliable future gas supply was accomplished with the signing of a Gas Sales Agreement with Eni Australia B.V. for the purchase of some 750 petajoules (Pj)

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<sup>3</sup> Department of Industry, Innovation and Science (2016) *Australian Energy Statistics*, Table Q Australian consumption and production of natural gas, by state, physical units, <https://industry.gov.au/Office-of-the-Chief-Economist/Publications/Pages/Australian-energy-statistics.aspx#>, note based on approximation of 1,000 million cubic metres to 40 Petajoules. See International Energy Agency (2011) *World Energy Outlook*, p304, Box 8.3: What's in a bcm?, <http://www.worldenergyoutlook.org/weo2011/>

<sup>4</sup> PWC (2016) *Annual Report*, p35, [https://www.powerwater.com.au/data/assets/pdf\\_file/0017/133163/2016\\_Power\\_and\\_Water\\_Annual\\_Report.PDF](https://www.powerwater.com.au/data/assets/pdf_file/0017/133163/2016_Power_and_Water_Annual_Report.PDF)

of gas over the next 25 years, commencing early in 2009. In addition, a Gas Transport Agreement was signed with the Australian Pipeline Trust to transport the gas from the processing plant near Wadeye to the existing Amadeus Basin Darwin Pipeline. This will ensure that the Corporation has sufficient gas to meet the future power needs of the Territory and to continue providing a reliable power supply.<sup>5</sup>

The power needs of the Territory have not increased since that agreement was signed, quite the opposite. In addition to the gas demand reduction mentioned above, the decommissioning of the Gove aluminium smelter, a major energy user, has seen Territory energy use decline:

The significant fall in energy use in the Northern Territory is mainly attributed to the closure of the Gove alumina refinery in May 2014.<sup>6</sup>

Expected demand from Gove was a major factor in the commissioning of supply from Eni.<sup>7</sup> Its closure has left PWC with large amounts of surplus gas which it hopes to sell via a new pipeline to the eastern Australian gas market:

### **Surplus gas**

The Northern Gas Inter-connector Pipeline (NGP) will enable the sale of Power and Water's surplus gas to the eastern seaboard.<sup>8</sup>

The Australia Institute has long opposed the Northern Gas Pipeline (NGP) project.<sup>9</sup> It risks exposing Territorians to the problems of the east coast market, problems it will do nothing to solve. The 25-35Pj of gas that would be sold through it represent less than 2 percent of the volume of the east coast market (including exports).<sup>10</sup> Further expansion of Territory gas supply through exploitation of unconventional resources

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<sup>5</sup> PWC (2006) Annual report 2006, p2, [https://www.powerwater.com.au/data/assets/pdf\\_file/0012/1515/2006\\_Annual\\_Report\\_-\\_web.pdf](https://www.powerwater.com.au/data/assets/pdf_file/0012/1515/2006_Annual_Report_-_web.pdf)

<sup>6</sup> Department of Industry, Innovation and Science (2016) *Australian Energy Statistics*, p14, <https://industry.gov.au/Office-of-the-Chief-Economist/Publications/Documents/aes/2016-australian-energy-statistics.pdf>

<sup>7</sup> Manning (2013) *Rio Tinto to keep Gove alumina refinery running*, <http://www.smh.com.au/business/rio-tinto-to-keep-gove-alumina-refinery-running-20130213-2edbo.html>

<sup>8</sup> PWC (2016) Annual report, p35, bold in original

<sup>9</sup> Campbell (2015) *Passing gas: Economic myths around the Northern Territory's North East Gas Interconnector pipeline*, <http://www.tai.org.au/content/passing-gas-economic-myths-around-northern-territorys-north-east-gas-interconnector-pipeline>, appended to this submission.

<sup>10</sup> Robertson (2015) *Pipe dream: a financial analysis of the Northern Gas Pipeline*, <http://ieefa.org/wp-content/uploads/2016/05/Pipe-Dream-A-Financial-Analysis-of-the-NEGI-MAY-2016.pdf>

would increase calls by these suppliers for links to the east coast market, bringing risk and instability to Territorians.

The factor driving the construction of the NGP is not a desire to ensure Territorians are paid top dollar for their gas. If that were the case the infrastructure would ensure gas could be delivered to more than one customer. The current proposal is to deliver gas only to Incitec Pivot in Mt Isa.<sup>11</sup> Instead, it appears that the rationale is to stop PWC from having to pay suppliers for gas it does not need and cannot use.

The NGP will cost NT gas users dearly, despite former Chief Minister Adam Giles' claim that taxpayers will not pay for it.<sup>12</sup> Taxpayers may not pay the capital costs, but the prices that the pipeline's owners will charge PWC will be recouped by charging more to its customers – almost every Territorian. As pointed out by the Institute for Energy Economics and Financial Analysis:

The [NGP] is being built to dispose of gas that was acquired by the Northern Territory government's Power and Water Commission under a take or pay arrangement. Essentially if the PWC can dispose of this gas for any return it is better off than just paying for the gas and not taking delivery.<sup>13</sup>

While this inquiry may not be directly concerned with gas infrastructure projects such as the NGP, it is important to understand that infrastructure investment can lead to increased demand for gas, particularly when excess capacity has been built due overly optimistic expectation of gas demand. Conversely, prospective gas producers will always call for more investment in infrastructure. This has certainly been the case in east coast Australia and is also the case with the NGP and would-be unconventional gas producers in the NT. Development of unconventional gas in the NT will lead to further calls for infrastructure investment in the interests of producers rather than the Northern Territory public.

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<sup>11</sup> Renault (2015) *Fertiliser giant Incitec Pivot a big winner in Northern Territory gas pipeline decision* <http://www.abc.net.au/news/rural/2015-11-18/nt-gas-pipeline-to-benefit-fertiliser-giant-incitec-pivot/6950326>

<sup>12</sup> MacDonald-Smith et al (2015) *Jemena to build NT gas pipeline to supply Incitec Pivot* <http://www.smh.com.au/business/energy/jemena-to-build-nt-gas-pipeline-to-supply-incitec-pivot-20151115-gkzpw8.html>

<sup>13</sup> Robertson (2015) *Pipe dream: a financial analysis of the Northern Gas Pipeline*, <http://ieefa.org/wp-content/uploads/2016/05/Pipe-Dream-A-Financial-Analysis-of-the-NEGI-MAY-2016.pdf>

## THEME 7.7 ECONOMIC IMPACTS - NET BENEFITS AND DISTRIBUTION

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From an economic perspective, the main benefit that would accrue to the NT community from developing unconventional gas resources would be royalties. Mining and gas royalties are not a major source of funding for Australian state and territory governments<sup>14</sup>. The arguable exception is Western Australia, which receives 15% of its revenue from mining royalties.<sup>15</sup> The NT Budget for 2016-17 is for \$132 million in royalty revenue from all mining, just 2% of its \$6.55 billion budgeted revenue. Revenue from the Commonwealth Government accounts for over 50% of Territory Revenue.<sup>16</sup>

Increasing gas production through unconventional developments will not change this balance. Claims that further gas production can bring “independence from Canberra” or that it is the Territory’s “only hope” are misguided.<sup>17</sup>

The inability of unconventional gas to make serious revenue for state governments is demonstrated by the experience of Queensland. Even after years of gas production and now several years of exports, Queensland gas royalties for this year are budgeted at \$68 million. This represents just 0.01 percent of Queensland government revenue.<sup>18</sup>

It should also be noted that the gas industry has a record of avoiding and minimising all payments to Australian governments. Despite Australian gas production increasing to the point where we will become the largest gas exporter in the world, payments received under the Petroleum Resource Rent Tax (PRRT) are declining. The recent LNG

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<sup>14</sup> Peel, Denniss and Campbell (2014) *Mining the age of entitlement: State government assistance to the minerals and fossil fuel sector*, <http://www.tai.org.au/content/mining-age-entitlement>

<sup>15</sup> WA Treasury (2017) Budget Paper 3 Economic and Fiscal Outlook, <http://static.ourstatebudget.wa.gov.au/16-17/2016-17-wa-state-budget-bp3.pdf>, p89.

<sup>16</sup> NT Department of Treasury and Finance (2016) Budget Paper 2 Fiscal Outlook and Strategy, <http://www.treasury.nt.gov.au/PMS/Publications/BudgetFinance/BudgetPapers/I-BP2-1617.pdf>, p17.

<sup>17</sup> Chlanda (2017) Fracked gas our only hope: Northern Institute professor, <http://www.alicespringsnews.com.au/2017/04/21/fracked-gas-our-only-hope-northern-institute-professor/>; Herbert (2015) *Bidders for North East Gas Interconnector named*, <http://www.abc.net.au/news/rural/2015-04-02/gas-pipeline-interconnector/6367606>

<sup>18</sup> Queensland Treasury (2016) Budget Paper 2: Budget Strategy and Outlook 2016-17, <https://s3-ap-southeast-2.amazonaws.com/s3-media-budget/pdfs/budget+papers/bp2/4.%20Revenue.pdf>

projects are not projected to pay any PRRT for decades.<sup>19</sup> Large gas companies also routinely pay no company tax in Australia, despite generating huge revenues here.<sup>20</sup>

Balanced against the modest increases in revenue, costs that accrue to the state through infrastructure provision and other forms of subsidy need to be considered. The Northern Territory government and community incur costs in building infrastructure for the mining and fossil fuel industries. Between 2008-09 and 2013-14 the Territory government spent \$381 million on measures that wholly benefited the mining and fossil fuel industries.<sup>14</sup> The NT government's expenditure focused on the Inpex gas development. Such expenditure would likely continue with unconventional development as discussed above. This has major implications for the distribution of costs and benefits from mining and gas projects, directing more costs onto the community.

The NT is not unusual in this respect. Western Australia's Treasury noted in 2011 in relation to the development of the Northwest Shelf gas project:

In 2010 net present value terms, the cost of Western Australia's assistance to the North West Shelf project (e.g. payment of subsidies to the State's power utility to help cover the losses it initially incurred under crucial 'take or pay' gas contracts) is estimated to be around \$8 billion.<sup>21</sup>

Queensland Treasury's comments are aimed at mining, but the principle is the same for gas projects:

Governments face budget constraints and spending on mining related infrastructure means less infrastructure spending in other areas, including social infrastructure such as hospitals and schools. For many projects directly related to assisting mining industry development, such as land acquisitions for state development areas, the expected timeframes for cost recovery are extremely long (sometimes decades). The opportunity cost of this use of limited funds is a real cost to government and the community.<sup>22</sup>

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<sup>19</sup> Aston (2015) Multinational oil and gas giants paying no petroleum resource rent tax, <http://www.smh.com.au/business/the-economy/multinational-oil-and-gas-giants-paying-no-petroleum-resource-rent-tax-20151217-glpusi.html>

<sup>20</sup> Kenny (2017) Global gas giants use loophole to avoid tax on billions from Australian operations, <http://www.smh.com.au/federal-politics/political-news/global-gas-giants-use-loophole-to-avoid-tax-on-billions-from-australian-operations-20170425-gvrwn9.html>

<sup>21</sup> WA Treasury (2011) *GST Distribution Review: WA Submission*, [http://www.gstdistributionreview.gov.au/content/submissions/downloads/issues\\_paper/wa\\_gov.pdf](http://www.gstdistributionreview.gov.au/content/submissions/downloads/issues_paper/wa_gov.pdf), page 13.

<sup>22</sup> Queensland Treasury (2013) *Queensland Treasury Response to Commonwealth Grants Commission*

While the costs of assisting mining and gas projects can often be found in budget papers, other costs are more difficult to assess. Environmental costs associated with unconventional gas development also need to be considered. The Australia Institute's research on some of these issues is outlined in the following sections.

## THEME 7.3 AIR - CLIMATE CHANGE

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The Australia Institute has conducted and commissioned research on methane emissions from unconventional gas extraction. These emissions have been severely underestimated thus far in Australia. Development of unconventional gas in the Northern Territory is likely to lead to significant increases in Territory emissions, but unless Australian methodology changes, these emissions may not be accounted for.

The current methodology for measuring greenhouse gas emissions from unconventional gas extraction is based on assumed and outdated methane emissions factors, rather than direct measurement of wells, pipelines and other gasfield infrastructure. The estimate used by the Australian Government is 0.058 tonnes of methane leaked per kilotonne of methane produced, or 0.0058%. This estimate is based on a historic US emissions factor designed for measuring conventional gas emissions and is no longer used in the USA. Actual measurements by 16 peer reviewed research projects, using improved technology to take direct measurements from gas fields in the US, have ranged from 2-17% of production.<sup>23</sup>

The impact of these unaccounted-for methane emissions is seen in recent research showing that US methane emissions have risen 30% in the last decade. The study used evidence from atmospheric observations to trace the largest rise of these emissions to the central part of the US, where oil and gas extraction has expanded dramatically over the same time period.<sup>24</sup>

In addition to higher emissions from gasfield operations, new research has found that below ground dewatering of aquitards required for unconventional gas extraction may

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*Response to Terms of Reference for Commonwealth Grants Commission 2015 Methodology Review,*  
[https://cgc.gov.au/index.php?option=com\\_attachments&task=download&id=1727](https://cgc.gov.au/index.php?option=com_attachments&task=download&id=1727)

<sup>23</sup> Lafleur et al, 2016, *A review of current and future methane emissions from Australian unconventional oil and gas production*, Melbourne University Melbourne Energy Institute,  
<http://energy.unimelb.edu.au/library/a-review-of-current-and-future-methane-emissions>

<sup>24</sup> Turner et al, 2016, *A large increase in U.S. methane emissions over the past decade inferred from satellite data and surface observation*, *Geophysical Research Letters*, Volume 43, Issue 5, 16 March 2016, p 2218-2224



have caused methane emissions from underground gas deposits to be released into rivers and other weak areas.<sup>25</sup>

As well as the obvious implications of underestimated methane emissions and the ability to meet our Paris climate commitments, there are also cost implications as producers capture a lower portion of reserves than anticipated.

Further information on the fugitive and migratory emissions of unconventional gas emissions can be found in two recent reports from the Melbourne Energy Institute, commissioned by the Australia Institute, *A review of current and future methane emissions from Australian unconventional oil and gas production* and *The risk of migratory methane emissions resulting from the development of Queensland coal seam gas*. Both reports are attached as appendices to this submission.

## THEME 7.6 SOCIAL IMPACTS - INSURANCE

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Insurance companies have refused to insure against risks associated with unconventional gas extraction, both in Australia and in the US.

In the US, 'homeowners can be confronted with uninsurable property damage for activities that they cannot control. And now a growing number of banks won't give new mortgage loans on homes with gas leases because they don't meet secondary mortgage market guidelines.'<sup>26</sup>

In the north west of NSW, farmers have been refused insurance cover for risks and contamination associated with unconventional gas extraction.<sup>27</sup>

## THEME 7.7 ECONOMIC IMPACTS - PROPERTY VALUES

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The presence of unconventional gas wells on properties in Queensland have led to banks refusing to accept those properties as securities to give bridging loans. A 2016 letter from the Commonwealth Bank to property owners in Chinchilla, Queensland,

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<sup>25</sup> Lafleur et al, 2017, *The risk of migratory methane emissions resulting from the development of Queensland coal seam gas*, Melbourne Energy Institute, <http://tai.org.au/content/risk-migratory-methane-emissions-resulting-development-queensland-coal-seam-gas>

<sup>26</sup> New York State Bar Association Journal Nov/Dec 2011, pg 12

<sup>27</sup> Caskey, 2015, *CSG too risky for insurers*, <http://www.farmonline.com.au/story/3365648/csg-too-risky-for-insurers/>

shows that the presence of coal seam gas wells on the property is the reason their application for a bridging loan to buy another property was refused.<sup>28</sup>

A 2014 study by the NSW Valuer Generals on links between property values and unconventional gas industry did not make firm conclusions as a result of the lack of available data on house sales in the period since the industry commenced. It did, however, note anecdotal evidence that ‘negative perceptions of CSG led to a reduction in the number of potential purchasers and an increase in the time taken to sell properties.’<sup>29</sup>

## THEME 7.7 ECONOMIC IMPACTS - OTHER INDUSTRIES

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The rapid expansion of unconventional gas projects has damaged Australia’s manufacturing industry through its labour market impacts and effect on gas prices. The unconventional gas industry has also damaged local economies where it operates, impacting small business, agriculture, and local government sectors.

Economic modelling by the Queensland unconventional gas company Arrow LNG for its Economic Impact Assessment found that this project would displace \$441.5 million worth of manufacturing output and 1,000 manufacturing jobs in Queensland.<sup>30</sup>

The most detailed examination of the economic impacts of unconventional gas development on local economies was conducted in the Darling Downs. The study was carried out between 2008 and 2013 by the industry-funded Sustainable Minerals Institute (SMI) at the University of Queensland.<sup>31</sup>

This study surveyed stakeholders from different sectors in the local community including the local business community, agriculture, local government, advocacy groups and environmental consultants, as well as the mining and unconventional gas industries.

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<sup>28</sup> Robertson, 2016, *Commonwealth Bank: coal seam gas makes property ‘unacceptable’ as loan security*, <https://www.theguardian.com/environment/2016/sep/30/commonwealth-bank-coal-seam-gas-makes-property-unacceptable-as-loan-security>

<sup>29</sup> Office of the Valuer General, *Study on the impact of the coal seam gas industry on land values in NSW*

<sup>30</sup> See Grudnoff, M (2015) *An analysis of the economic impacts of Arrow Energy’s Gladstone LNG Plant*.

<sup>31</sup> Everingham, J, Collins, N, Rodriguez, D, Cavaye, J, Vink, S, Rifkin, W & Baumgartl, T (2013) *Energy resources from the food bowl: an uneasy co-existence. Identifying and managing cumulative impacts of mining and agriculture. Project report*, CSRM, The University of Queensland: Brisbane.

Far from mining and unconventional gas providing economic benefits, local businesses felt that it had reduced financial capital, human capital, infrastructure, social capital and natural capital.

Local businesses have to compete with inflated gas industry wages in order to recruit and retain staff and they experience increased rent and competition for services (particularly trade and mechanical repairs). There are also disruptions to farmers from the rollout of access roads, pipelines, water treatment plants and other infrastructure. Big increases in truck traffic tend to disrupt other forms of transport and damage roads.

Further information about the economic and social impacts can be found in our 2015 report on the impacts of the Queensland unconventional gas industry, *Be careful what you wish for*, attached as an appendix to this submission.

## THEME 7.6 SOCIAL IMPACTS - EMPLOYMENT

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Gas extraction is a capital-intensive industry; gas companies employ few people relative to the capital invested. Despite this, Australia's gas industry has a history of exaggerating the jobs that will be created from gas projects.

A 2011 report prepared for Santos by Allen Consulting Group found that a potential coal seam gas development in Northwest NSW would increase employment opportunities in NSW by "around 2,900 ongoing full time positions", even though the project would only create about 30 gas industry jobs. Over 500 jobs would apparently be created in the public sector, at taxpayer expense.<sup>32</sup>

A 2012 report prepared for the Australian Petroleum Production and Exploration Association (APPEA) by Deloitte found that the "economy-wide impacts" of new oil and gas projects included increasing Australia's employment by 103,000 full-time equivalent jobs in 2012.<sup>33</sup> APPEA used this research to justify its claim that the natural gas industry (oil was not mentioned) was responsible for 100,000 jobs in 2012.<sup>34</sup>

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<sup>32</sup> Lamacraft, Brown and Claughton (2014) *Santos "a first class operator"*, <http://www.abc.net.au/news/rural/programs/nsw-country-hour/2014-06-20/nsw-santos-on-jobs-and-water/5538608>, The Allen Consulting Group (2011) *The economic impacts of developing coal seam gas operations in Northwest NSW*, [http://www.acilallen.com.au/cms\\_files/acgeconomicimpactcoalseam2011.pdf](http://www.acilallen.com.au/cms_files/acgeconomicimpactcoalseam2011.pdf)

<sup>33</sup> Deloitte Access Economics (2012) *Harnessing our comparative energy advantage*, p 31

<sup>34</sup> APPEA (n.d.) *Campaign messages*, <https://www.ournaturaladvantage.com.au/campaign-messages/>

In fact, the ABS found that employment in oil and gas extraction increased by 9,400 between May 2012 and May 2013 (to 24,700). Even when temporary construction jobs created to build the projects are taken into account (about 40,805),<sup>35</sup> that would still be 49,795 jobs short of APPEA's 100,000 jobs claim.

Employment in the gas industry is in decline. As of February 2017, there are 19,200 total employed people in oil and gas extraction, 16,900 fewer than the peak in August 2015 (36,100).<sup>36</sup>

Far from creating many additional jobs, the coal seam gas industry has been found to reduce employment in certain sectors. A study of Queensland's unconventional gas expansion by CSIRO's Gas Industry Social and Environmental Research Alliance found that for every 10 additional people employed in coal seam gas, 18 agricultural jobs were lost. The expansion did cause a growth in construction and professional service jobs (jobs related to short-term construction) but virtually no additional retail or manufacturing jobs.<sup>37</sup>

**Figure 1: Coal seam gas (CSG) employment spillovers over different sectors**

	Elasticity	Additional job for each new CSG job
Local goods sector		
Construction	0.832 (0.426)*	1.414
Professional services	0.704 (0.259)**	0.422
Retail trade	0.011 (0.140)	0.024
Accommodation and food services	0.375 (0.263)	0.471
Other services	-0.385 (0.247)	-0.890
Tradable goods sector		
Manufacturing	0.068 (0.199)	0.160
Agriculture	-0.314 (0.182)*	-1.790

Source: Fleming and Measham (2014) *Local economic impacts of an unconventional energy boom*, p 90

Territorians seeking employment for any unconventional project in the Northern Territory will have to compete with experienced workers from interstate, including the 16,900 fewer people employed now than they were at the industry's employment peak. These thousands of highly-qualified workers are more likely to fill positions than

<sup>35</sup> Calculation by The Australia Institute based on available Bureau of Resources and Energy figures: The Australia Institute (2013) *Did the gas industry create 100,000 jobs last year?*, <http://www.factsfightback.org.au/did-the-gas-industry-create-100000-jobs-last-year-check-the-facts/>

<sup>36</sup> ABS (March 2017) *Labor Force, Australia, Detailed, Quarterly*, <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6291.0.55.003Feb%202017?OpenDocument>

<sup>37</sup> Fleming and Measham (2014) *Local economic impacts of an unconventional energy boom*, p 78-94

unskilled Territorians with no experience in gas field construction and operation. When the gas industry employs local people, they tend to be skilled workers who relocate from local manufacturing and agriculture.

Experience in Queensland has shown that construction workforces are almost entirely male non-residential workers living in workers camps on the outskirts of towns. These workers are often referred to as fly-in, fly-out (FIFO) or drive-in, drive-out (DIDO). Few people from local regional communities are likely to be employed in either the construction or the operational phases of the gas fields.

## CONCLUSION

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The development of unconventional gas would present the Northern Territory community with considerable risks and few benefits. It is likely to reduce energy security by linking the Territory to volatile east coast or world markets. Considerable costs could be incurred in relation to gas infrastructure, while the benefits of royalties are likely to be modest.



The **Australia Institute**  
Research that matters.

# **Oil in the Great Australian Bight**

## **Comparative report on employment potential**

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Rod Campbell  
Bill Browne  
Noah Schultz-Byard

**August 2019**

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Level 5, 131 City Walk

Canberra, ACT 2601

Tel: (02) 61300530

Email: [mail@tai.org.au](mailto:mail@tai.org.au)

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# Summary

Norwegian oil company Equinor is planning exploratory drilling for oil and gas in the Great Australian Bight beginning in late 2020, after it received two offshore leases from its partner BP in 2017. BP abandoned plans to drill itself, although it still holds two offshore leases which remain “prospects”.

Modelling commissioned by the oil and gas lobby shows that South Australia is unlikely to receive any noticeable benefit from tax payments as a result of oil and gas production in the Great Australian Bight. What benefits exist will go mostly to the Commonwealth, but even those benefits are small relative to the total Commonwealth budget, would take decades to materialise and are based on “preliminary” modelling.

The modelling shows that oil production plateaus from the early 2030s, but no Petroleum Resource Rent Tax payments are expected until 2047. In the late 2040s, total tax payments are predicted to peak at about \$4.5 billion before quickly falling again. That includes indirect taxes. Taxes paid just by those drilling exceed \$4 billion in only one year.<sup>1</sup> Assuming even modest growth in the Australian economy (and Commonwealth budget) of 2 percent per year, total payments as a result of drilling the Great Australian Bight would never exceed even half a percent of Commonwealth revenues in a given year.

Polling previously undertaken by The Australia Institute in March 2019 showed that 60% of Australians are opposed to allowing drilling to take place in the Great Australian Bight.<sup>2</sup> New national polling has now revealed that most Australians think drilling in the Bight would have a negative effect on fishing, tourism and the natural environment, although they do think it would have a positive effect on jobs.

In fact, opening up the Great Australian Bight is unlikely to have much of an effect on jobs, and could even threaten employment in other industries.

Australia wide, the oil and gas industry employs 19,000 people out of a workforce of 10.7 million people. This represents less than two out of every thousand jobs in

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<sup>1</sup> ACIL Allen Consulting (2018) *Petroleum development in the Great Australian Bight: A preliminary view of the economic impact of development*, pp. iii, 14–15,  
[https://www.appea.com.au/media\\_release/potential-bight-benefits-great-for-state-and-nation/](https://www.appea.com.au/media_release/potential-bight-benefits-great-for-state-and-nation/)

<sup>2</sup> The Australia Institute (2019) *Polling – Great Australian Bight*,  
<https://www.tai.org.au/sites/default/files/Polling%20Brief%20-%20March%202019%20-%20Great%20Australian%20Bight%20final.pdf>



Australia, 0.18 percent. South Australia is similar, with 1,665 people working in oil and gas out of 746,000 employed in total at the 2016 census.

The North West Shelf project saw employment peak at 1,660 employees and later declined somewhat to less than 1,500. A Bight oil project is likely to be smaller, with job numbers perhaps between 1,000 and 1,500 people. Industry modelling puts the figure even lower, at just an average of 826 jobs over the project lifespan. It is important to remember that the majority of any future employees would be fly-in-fly-out (FIFO) workers who would be flown from around Australia, not people from local regions.

Exploration drilling in the Great Australian Bight would be unlikely to pay any royalty income or tax to the state or federal governments. On the contrary, expenses on exploration would be likely used as deductions from future income from the Bight project.

The entire extractive sector paid \$289 million in royalties for the minerals, oil and gas extracted in South Australia in 2018-19. This represents just 1.4 percent of South Australia's total revenue of \$20.4 billion in that year. South Australia's government received substantially more from car registration, \$432 million, than it did from the mining, oil and gas sector.

Oil production in the Bight could generate more royalty revenue – the North West Shelf project is budgeted to contribute \$862 million in 2019-20 to the WA government, almost 3 percent of the state's revenue of \$31.3 billion. Before such revenues were collected, however, the Western Australian state had to incur substantial expenses, as is made clear by the WA Treasury:

In 2010 net present value terms, the cost of Western Australia's assistance to the North West Shelf project (e.g. payment of subsidies to the State's power utility to help cover the losses it initially incurred under crucial 'take or pay' gas contracts) is estimated to be around \$8 billion.<sup>3</sup>

Decades of subsidy may be necessary before major oil and gas projects provide benefits to state governments. In contrast, the tourism, fishing and aquaculture industries on the SA coast already employ over 10,000 people and provide sustainable benefits through locally owned businesses. Across South Australia, Victoria and Tasmania, those same industries currently employ over 27,000 people.

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<sup>3</sup> WA Government (2011) *GST Distribution Review: WA Submission*, p. 13,  
[http://www.gstdistributionreview.gov.au/content/submissions/downloads/issues\\_paper/wa\\_gov.pdf](http://www.gstdistributionreview.gov.au/content/submissions/downloads/issues_paper/wa_gov.pdf)

**Table: Employment in at-risk areas, by state and industry**

	<b>Tourism</b>	<b>Aquaculture and fisheries</b>	<b>Total</b>
<b>South Australia</b>	8,900	1,536	10,436
<b>Victoria</b>	8,300	873	9,173
<b>Tasmania</b>	5,300	2,113	7,413
			<b>27,022</b>

# Introduction

The Great Australian Bight makes up a large part of Australia's southern coast. Remote from Australia's main cities, the area has significant environmental values and hosts a range of industries.

The waters of the Great Australian Bight Marine Park are home to a range of marine life, such as tuna, sea eagles and albatross. It is an important breeding ground for great white sharks, southern right whales and sea lions.

Geoscience Australia has examined the central area of the Bight, estimating that there could be 5 billion barrels (Bbbl) of oil, and 14 trillion cubic feet (Tcf) of gas.<sup>4</sup> To put this in context, Western Australia's Canarvon Basin, where the North West Shelf project is located, had approximately 4.5 Bbbl of economically extractable liquid hydrocarbons when extraction began,<sup>5</sup> and 33 Tcf of gas.<sup>6</sup> Note that the estimates are not directly comparable – the Bight estimate reflects total resources whereas the North West Shelf reflects what can be extracted economically. For the sake of comparison, it appears that any eventual Great Australian Bight oil project would be of somewhat smaller size than the North West Shelf.

Norwegian company Equinor is planning exploratory drilling for oil and gas in the Great Australian Bight in late 2020, after it received two offshore leases from its partner BP in 2017. BP abandoned plans to drill itself, although it still holds two offshore leases which remain "prospects".<sup>7</sup> Seismic testing by oil and gas explorer PGS was planned for late 2019, although as of August 2019 it has been suspended.<sup>8</sup>

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<sup>4</sup> Totterdell et al. (2008) *Mid–Late Cretaceous organic-rich rocks from the eastern Bight Basin: implications for prospectivity*, [https://www.researchgate.net/publication/236647327\\_Mid-Late\\_Cretaceous\\_organic-rich\\_rocks\\_from\\_the\\_eastern\\_Bight\\_Basin\\_implications\\_for\\_prospectivity](https://www.researchgate.net/publication/236647327_Mid-Late_Cretaceous_organic-rich_rocks_from_the_eastern_Bight_Basin_implications_for_prospectivity)

<sup>5</sup> Geoscience Australia (2004) *Australian Energy Resource Assessment – Second edition*, <https://arena.gov.au/knowledge-bank/australian-energy-resource-assessment-second-edition-2014/>

<sup>6</sup> Woodside Petroleum (2008) *North West Shelf*, <https://web.archive.org/web/20080615005619/http://www.woodside.com.au/Our+Business/Producti+on/Australia/North+West+Shelf/>

<sup>7</sup> Mathiesen (2018) *BP plan to drill in Great Australian Bight risked 750km oil spill, documents show*, <https://www.theguardian.com/environment/2018/apr/06/bp-plan-to-drill-in-great-australian-bight-risked-750km-oil-spill-documents-show>

<sup>8</sup> Briggs (2019) *Great Australian Bight seismic testing gets green light*, <https://www.abc.net.au/news/2019-01-15/great-australian-bight-seismic-testing-gets-green-light/10716252>; The Advertiser (2019) *PGS suspends search for oil in Great Australian Bight*,

Importantly, the Bight's waters are unusually deep water for oil drilling, with ocean depths of approximately 1,000–2,500 metres.<sup>9</sup> By comparison, the principle oil and gas fields in the North West Shelf area range between 125 and 131 metres.<sup>10</sup> Such deep water both increases costs for producers and increases environmental risks. Specialised ultra-deepwater equipment would be required to produce oil in the Bight and one of the world's worst oil disasters, the Deepwater Horizon oil spill in the Gulf of Mexico, occurred in water of similar depth.

A major oil spill in the Bight could impact other industries on the coasts of South Australia, Victoria and Tasmania such as fishing, aquaculture and tourism, which are major industries for many coastal towns.

The economic impacts of the proposed exploration program would be minimal. Such activities are highly capital intensive rather than labour intensive – they employ a lot of machinery and equipment, but relatively few people. The capital equipment, such as the specialised ultra-deepwater harsh environment rig BP had planned to use, the Ocean GreatWhite, is almost entirely imported providing little stimulus to the Australian economy.<sup>11</sup> In the exploration phase, production would be minimal, paying no royalties or taxes.

This minimal economic impact of exploration was acknowledged by BP. BP's Environment Plan Summary stated:

BP discussed potential opportunities that will arise in locations such as Ceduna. It was noted however, that at this early stage of exploration, employment opportunities are limited.<sup>12</sup>

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<https://www.adelaidenow.com.au/news/south-australia/pgs-suspends-search-for-oil-in-great-australia-bight/news-story/75ac1715eb0a2ffa37439caf40ff9797>

<sup>9</sup> BP (2016) *Great Australian Bight Exploration Drilling Program*, <https://web.archive.org/web/20160220211906/http://www.bpgabproject.com.au/go/doc/5771/2243598/>

<sup>10</sup> Woodside Petroleum (n.d.) *North West Shelf Project*, [https://vivid.blob.core.windows.net/nwsg/default-document-library/nws\\_project\\_corporate\\_brochure\\_v17.pdf?sfvrsn=0](https://vivid.blob.core.windows.net/nwsg/default-document-library/nws_project_corporate_brochure_v17.pdf?sfvrsn=0)

<sup>11</sup> Diamond Offshore (2015) *Ocean GreatWhite*, <http://www.diamondoffshore.com/assets/Documents/15%20-%20GreatWhite.pdf>; note that Equinor have not yet revealed which rig they are planning to use: Equinor (2019) *Environment plan for the Stromlo-1 Exploration Drilling Program*, p. 13, <https://www.equinor.com/content/dam/statoil/documents/australia/gab-project/Equinor-Environment-Plan-Rev-1-20190422.pdf>

<sup>12</sup> BP (2015) *GAB Exploration Drilling Program Environment Plan Summary (EPPs 37, 38, 39, 40)*; (2016) *GAB Exploration Drilling Program Environment Plan Overview (EPPs 37, 39)*,

Greater emphasis is put on the potential economic benefits of future production:

the biggest potential for local input lies in a potential future development and production phase, which could only be considered if a commercially and technically developable discovery is made and proved by appraisal drilling.<sup>13</sup>

The industry lobby group, Australian Petroleum Production and Exploration Association (APPEA) is far more optimistic:

While still in its very early stages, successful petroleum exploration and development in the Bight could bring a new wave of much-needed private sector investment in South Australia, delivering jobs, economic opportunities and regional development for decades to come. ... “The Bight could become a game-changer for South Australia, attracting investment, creating employment and delivering new revenue.”<sup>14</sup>

In fact, the economic impacts of oil production in the Great Australian Bight would be modest, particularly when seen in the context of the South Australian economy or the wider national economy. Against these modest potential benefits, South Australia should be weighing potential costs through government subsidisation of the project and the environmental risks that deepwater oil production imposes on the natural environment along with the industries and jobs that depend upon it.

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[https://web.archive.org/web/20161026140315/http://www.bp.com/content/dam/bp-country/en\\_au/about-us/what-we-do/exploring-great-australian-bight/environment-plan-overview.pdf](https://web.archive.org/web/20161026140315/http://www.bp.com/content/dam/bp-country/en_au/about-us/what-we-do/exploring-great-australian-bight/environment-plan-overview.pdf)

<sup>13</sup> ICN Gateway (2016) *BP Great Australian Bight Exploration*, <https://web.archive.org/web/20160416091713/https://gateway.icn.org.au/project/3552/bp-great-australian-bight-exploration?pl=1>

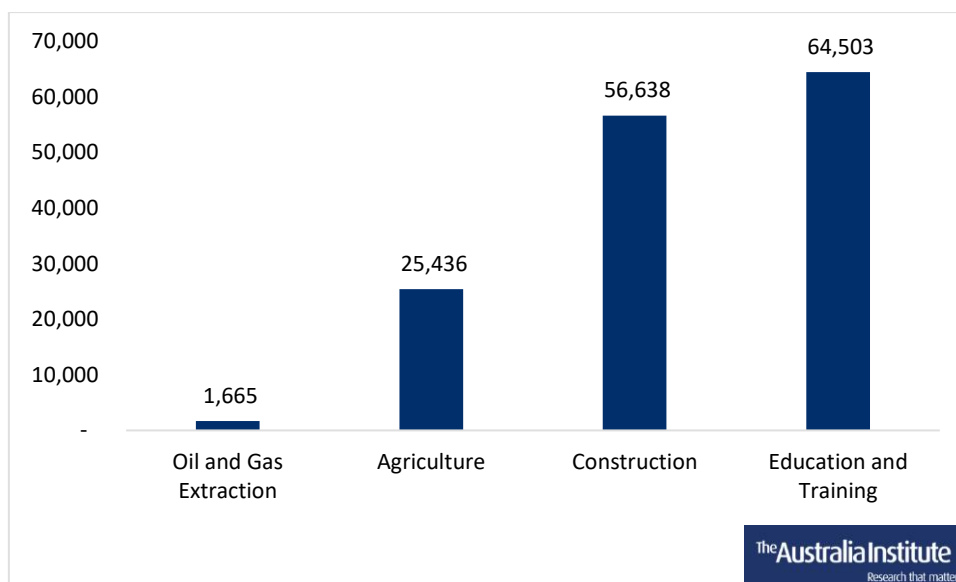
<sup>14</sup> APPEA (2018) *Potential Bight benefits great for State and nation*, [https://www.appea.com.au/media\\_release/potential-bight-benefits-great-for-state-and-nation/](https://www.appea.com.au/media_release/potential-bight-benefits-great-for-state-and-nation/)

# Employment

Oil and gas production is capital intensive and does not employ many people. Australia wide, the oil and gas industry employs 19,000 people out of a workforce of 10.7 million people. This represents less than two out of every thousand jobs in Australia, 0.18 percent.<sup>15</sup>

South Australia is similar, with 1,665 people working in oil and gas out of 746,000 people employed in total at the 2016 census. Most South Australian oil and gas workers work in the Cooper Basin in the north of the state. Oil and gas extraction is an extremely minor employer of South Australians compared to some of the main industries outlined below:

**Figure 1: Employment in South Australia, selected industries**



Source: ABS Census TableBuilder (2019) *2016 Census - Employment, Income and Education*

A potential future gas project in the Great Australian Bight would see a significant increase in oil and gas workers, but a very small increase in employment overall in South Australia. The North West Shelf project saw employment peak at 1,660 employees and later declined somewhat to less than 1,500.<sup>16</sup> Assuming a Bight oil

<sup>15</sup> ABS Census TableBuilder (2019) *2016 Census - Employment, Income and Education*

<sup>16</sup> ACIL Tasman (2009) *Nation Builder: How the North West Shelf Project has driven economic transformation in Australia*, <https://web.archive.org/web/20180326135010/http://www.woodside.com.au/Our-Business/Producing/Documents/NWSVACILTasmanreportOct2009.pdf>

project to be of slightly smaller size, between 1,000 and 1,500 people could be employed. This estimate is in line with APPEA's modelling, which predicts a peak of 1,361 jobs during construction and an average of 826 jobs over the project lifespan, based on estimated resources; that would increase to a peak of 1,521 ongoing jobs in the "high" case.<sup>17</sup>

It is important to remember that the majority of any future employees would be fly-in-fly-out (FIFO) workers who would be flown from around Australia to Adelaide and Ceduna and then to production rigs by helicopter. Many of these employees would not be from South Australia and would not reside in South Australia during their employment on the project.<sup>18</sup>

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<sup>17</sup> APPEA (2018) *Potential Bight benefits great for State and nation*

<sup>18</sup> ICN Gateway (2016) *BP Great Australian Bight Exploration*

# Royalty and tax income and state subsidies

Exploration drilling in the Great Australian Bight would be unlikely to pay any royalty income or tax to the state or federal governments. On the contrary, expenses on exploration would be likely used as deductions from future income from the Bight project.

If oil and gas production were to proceed, the impact on the state budget would be small. The South Australian state budget does not disaggregate oil and gas royalties from other mineral royalties. Regardless, the entire extractive sector paid \$289 million in royalties for the minerals, oil and gas extracted in South Australia in 2018–19. This represents just 1.4 percent of South Australia’s total revenue of \$20.4 billion in that year. South Australia’s government received substantially more from car registration, \$432 million, than it did from the mining, oil and gas sector.<sup>19</sup> Clearly, South Australia’s budget is not heavily influenced by changes in royalty revenue.

This would not change if oil and gas production in the Great Australian Bight began. “Preliminary” modelling commissioned by the oil lobby in 2018 predicts that the South Australian government would receive payments of \$41.7 million per annum, mostly in the form of payroll tax.<sup>20</sup> While not a royalty, for the purposes of comparison that is equivalent to just 14 percent of what the government currently receives from extractive sector royalties, or 0.2 percent of total state revenue.

The North West Shelf project now makes a considerable contribution to the Western Australian government, with grants via the Commonwealth of \$862 million budgeted in 2019–20. This is almost 3 percent of the WA state budget revenue of \$31.3 billion.<sup>21</sup>

Before such revenues were collected, however, the Western Australian state had to incur substantial expenses through infrastructure provision and other forms of subsidy. This is made clear by the Western Australian Treasury:

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<sup>19</sup> SA Government (2019) *2019-20 Budget Paper No. 3*, pp. 38–39, 40, 56, [https://statebudget.sa.gov.au/#Budget\\_Papers](https://statebudget.sa.gov.au/#Budget_Papers)

<sup>20</sup> ACIL Allen Consulting (2018) *Petroleum development in the Great Australian Bight: A preliminary view of the economic impact of development*, pp. iii, 30–31

<sup>21</sup> WA Government (2019) *2019-20 Budget Paper No. 3*, pp. 69, 75, <https://www.ourstatebudget.wa.gov.au/budget-papers.html>



In the 1970s and 1980s the State played a pivotal role in securing the development of the North West Shelf gas project through agreements, financial assistance and infrastructure provision. ... In 2010 net present value terms, the cost of Western Australia's assistance to the North West Shelf project (e.g. payment of subsidies to the State's power utility to help cover the losses it initially incurred under crucial 'take or pay' gas contracts) is estimated to be around \$8 billion.<sup>22</sup>

Based on the Western Australian experience, if South Australia expects to develop an offshore gas industry, it must be ready for potentially decades of subsidy before revenues are realised.

South Australia already subsidises its extractive sector. \$316 million was spent by the state government on measures that wholly or largely assisted the minerals and fossil fuel industries, including \$40 million on gas extraction, between 2008–09 and 2013–14.<sup>23</sup>

Such expenditure comes at the expense of funding other government priorities, such as health and education. This is made clear by the Queensland government:

Some costs may also be recovered by the government over time if they are directly industry related. However, there is a real opportunity cost for governments in undertaking the initial capital expenditure. Governments face budget constraints and spending on mining related infrastructure means less infrastructure spending in other areas, including social infrastructure such as hospitals and schools. For many projects directly related to assisting mining industry development, such as land acquisitions for state development areas, the expected timeframes for cost recovery are extremely long (sometimes decades). The opportunity cost of this use of limited funds is a real cost to government and the community.<sup>24</sup>

Gas and oil developments are likely to cost the South Australian government significant amounts before revenue is realised. This may be even more likely given the

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<sup>22</sup> WA Government (2011) *GST Distribution Review: WA Submission*, p. 13

<sup>23</sup> Peel, Campbell, & Denniss (2014) *Mining the age of entitlement*,  
<http://www.tai.org.au/content/mining-age-entitlement>

<sup>24</sup> Queensland Government (2014) *Queensland Treasury Response to Commonwealth Grants Commission: 2015 Methodology Review*, p. 15,  
<https://www.cgc.gov.au/sites/g/files/net5366/f/documents/2015%20Review%20Report/General%20Consultation/Commission%20position%20and%20staff%20discussion%20papers/State%20responses/R2015%20-%20CGC%202013-05%20-%20CGC%202013-06-S%20-%20CGC%202013-07-S%20-%20CGC%202013-08-S%20-%20QLD%20Response.pdf>

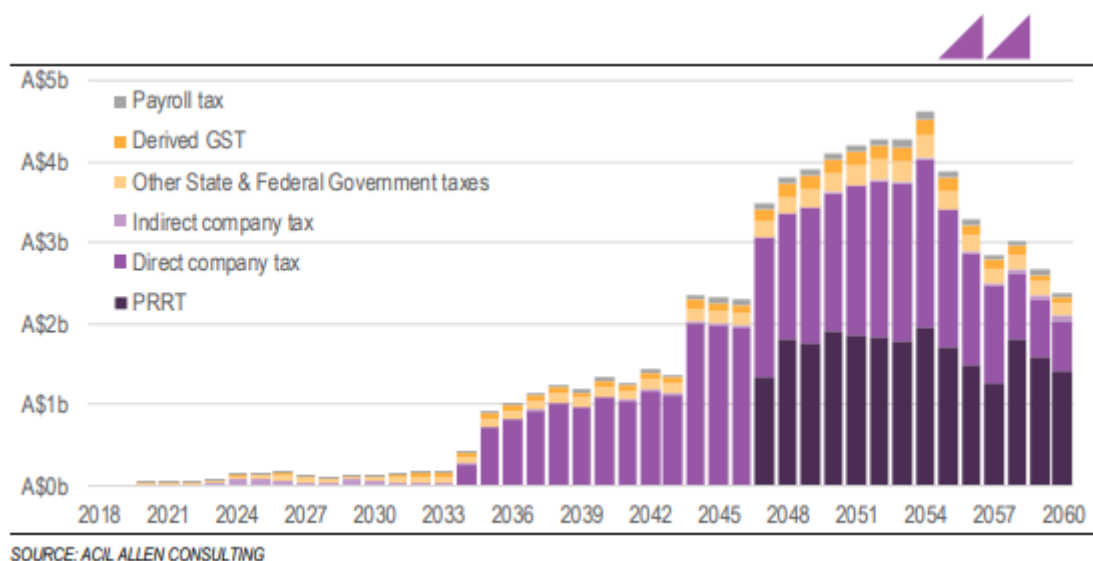
now-government gave “in-principle support” for royalty holidays to hasten development while in opposition.<sup>25</sup>

The “preliminary” modelling commissioned by the gas lobby shows that as well as very small tax benefits for the South Australian government over the entire project lifespan, the Commonwealth government will also receive little benefit until the mid-2030s.<sup>26</sup>

The taxation graph from the modelling is replicated in Figure 2 below. In the mid-2030s, total tax payments are predicted to be about \$1 billion. For reference, that represents about 0.2 percent of the current Commonwealth Budget.

Oil production plateaus from the early 2030s, but no Petroleum Resource Rent Tax payments are expected until 2047. In the late 2040s, total tax payments are predicted to peak at about \$4.5 billion before quickly falling again. That includes indirect taxes. Taxes paid just by those drilling exceed \$4 billion in only one year.<sup>27</sup> Assuming even modest growth in the Australian economy (and Commonwealth budget) of 2 percent per year, total payments as a result of drilling the Great Australian Bight would never exceed even half a percent of Commonwealth revenues in a given year.

**Figure 2: Contribution to real taxation, base case development scenario, A\$ billion**



<sup>25</sup> Russell (2014) *SA gas producers will get a five year royalty holiday under Labor’s plan for the resources sector*, <https://www.adelaidenow.com.au/business/sa-business-journal/sa-gas-producers-will-get-a-five-year-royalty-holiday-under-labors-plan-for-the-resources-sector/news-story/7bc5b6f34d429f9d6e2de514c6a8293f>

<sup>26</sup> ACIL Allen Consulting (2018) *Petroleum development in the Great Australian Bight: A preliminary view of the economic impact of development*, pp. iii, 30–31

<sup>27</sup> ACIL Allen Consulting (2018) *Petroleum development in the Great Australian Bight: A preliminary view of the economic impact of development*, pp. iii, 14–15

Source: ACIL Allen Consulting (2018) *Petroleum development in the Great Australian Bight: A preliminary view of the economic impact of development*, p. 30,  
[https://www.appea.com.au/media\\_release/potential-bight-benefits-great-for-state-and-nation/](https://www.appea.com.au/media_release/potential-bight-benefits-great-for-state-and-nation/)

South Australia is unlikely to receive any noticeable benefit from tax payments as a result of oil and gas production in the Great Australian Bight. What benefits exist will go mostly to the Commonwealth, but even those benefits are small relative to the total Commonwealth budget, would take decades to materialise and are based on “preliminary” modelling commissioned by the oil lobby.

Oil drilling will also have a modest impact on personal incomes in South Australia. Only a quarter of the income benefits are predicted to go to South Australia; in one year drilling is actually predicted to reduce South Australian incomes. “Rest of Australia” receives the majority of the real income benefits, although there are nine years where drilling is predicted to reduce “Rest of Australia” incomes.<sup>28</sup>

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<sup>28</sup> ACIL Allen Consulting (2018) *Petroleum development in the Great Australian Bight: A preliminary view of the economic impact of development*, p. 24

# Risks to other industries

Any potential benefits of oil and gas production in the Great Australian Bight need to be weighed against the risks to other industries from a potential oil spill. Industries that could be impacted by a spill during exploratory drilling or later production include tourism on the regional coastal areas, aquaculture and wild fisheries.

We have examined job numbers in these potentially impacted areas, to contrast these industries with the potential size of an oil extraction industry in the bight.

**Table 1: Employment in at-risk areas, by state and industry**

	Tourism	Aquaculture and fisheries	Total
South Australia	8,900	1,536	10,436
Victoria	8,300	873	9,173
Tasmania	5,300	2,113	7,413
			<b>27,022</b>

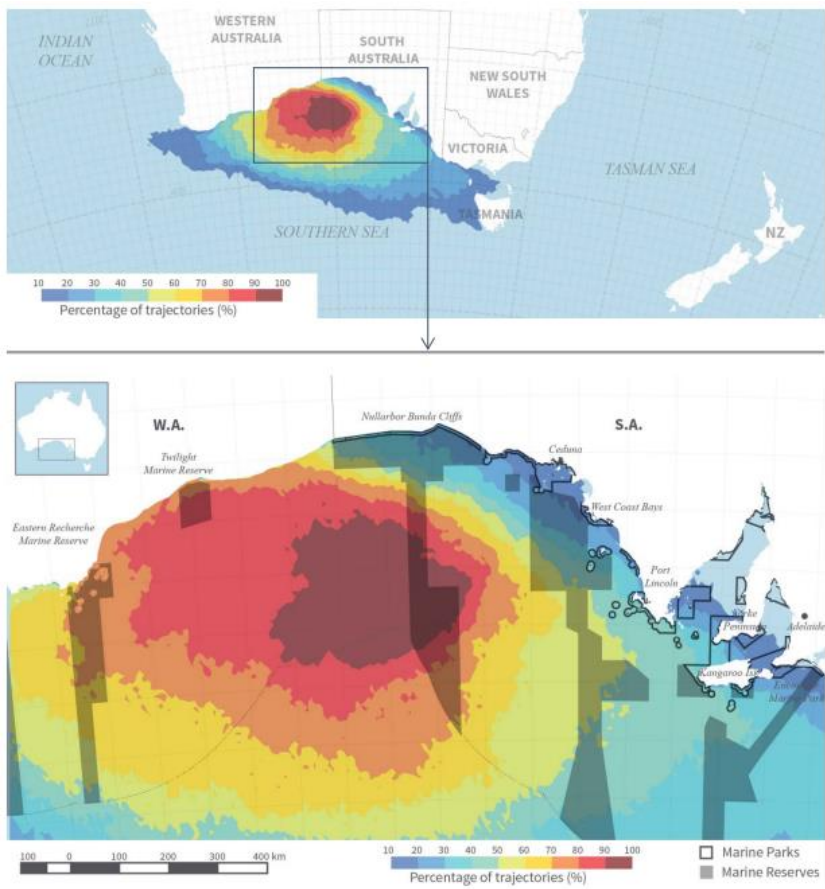
While some oil spill models indicate spills would also reach Western Australia and New South Wales, we have focused on the three states most at risk: South Australia, Victoria and Tasmania. Between these three states, up to 27,022 tourism, aquaculture and fisheries jobs could be threatened by an oil spill from drilling in the bight.

## OIL SPILL MODELLING

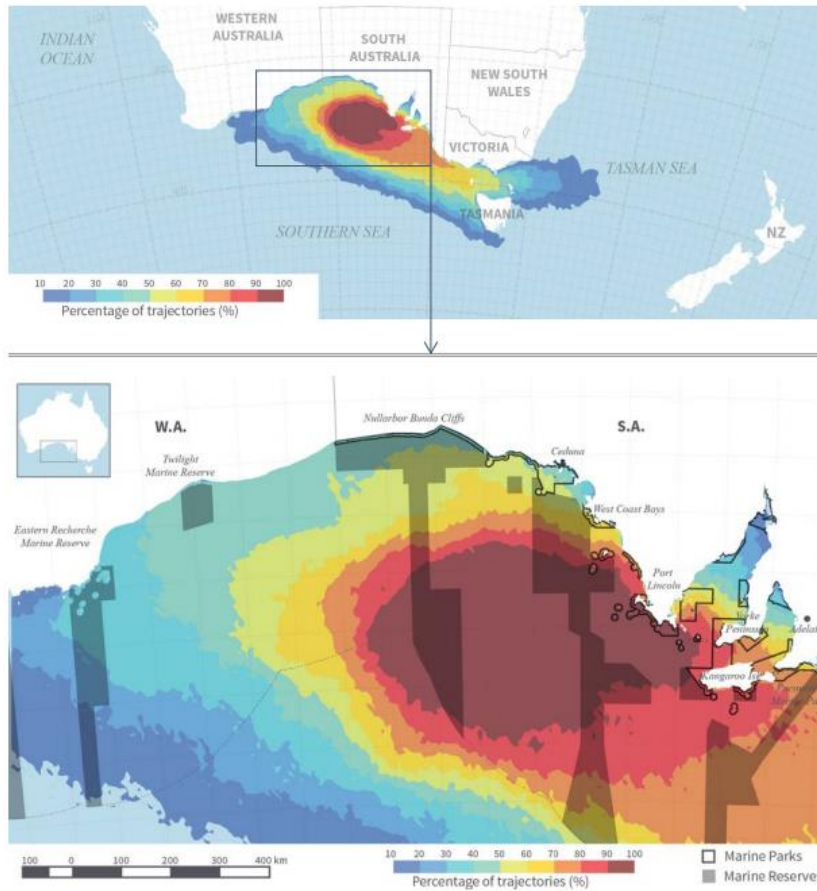
Figure 1 and 2 respectively depict the probability of socioeconomic impact at sea after four months of a modelled spill scenario during summer (Figure 1) and winter (Figure 2) with an oiling threshold corresponding to a level that would likely trigger the closure of fisheries. If this modelled spill occurred in summer, a 213,000 km<sup>2</sup> area has an 80% or higher likelihood of having so much oiling that fisheries would close. If it occurred in winter, a 265,000 km<sup>2</sup> area has an 80% or higher likelihood of having so much oiling that fisheries would close.<sup>29</sup> In the smaller maps, the socioeconomic impact analysis is overlaid with state marine parks and Commonwealth marine reserve areas. Several marine reserves and parks are in the area at risk.

<sup>29</sup> Lebreton (2015) *Stochastic analysis of deep sea oil spill trajectories in the Great Australian Bight*, <https://www.aph.gov.au/DocumentStore.ashx?id=440f4b65-12c9-47dd-b424-18d7ba047406&subId=411521>

Figure 3: Socioeconomic impact analysis for summer after 4 months



**Figure 4: Socioeconomic impact analysis for winter after 4 months**



The yellow marked areas show where there would be a 50 percent chance to have an oil thickness level above the threshold at the surface.

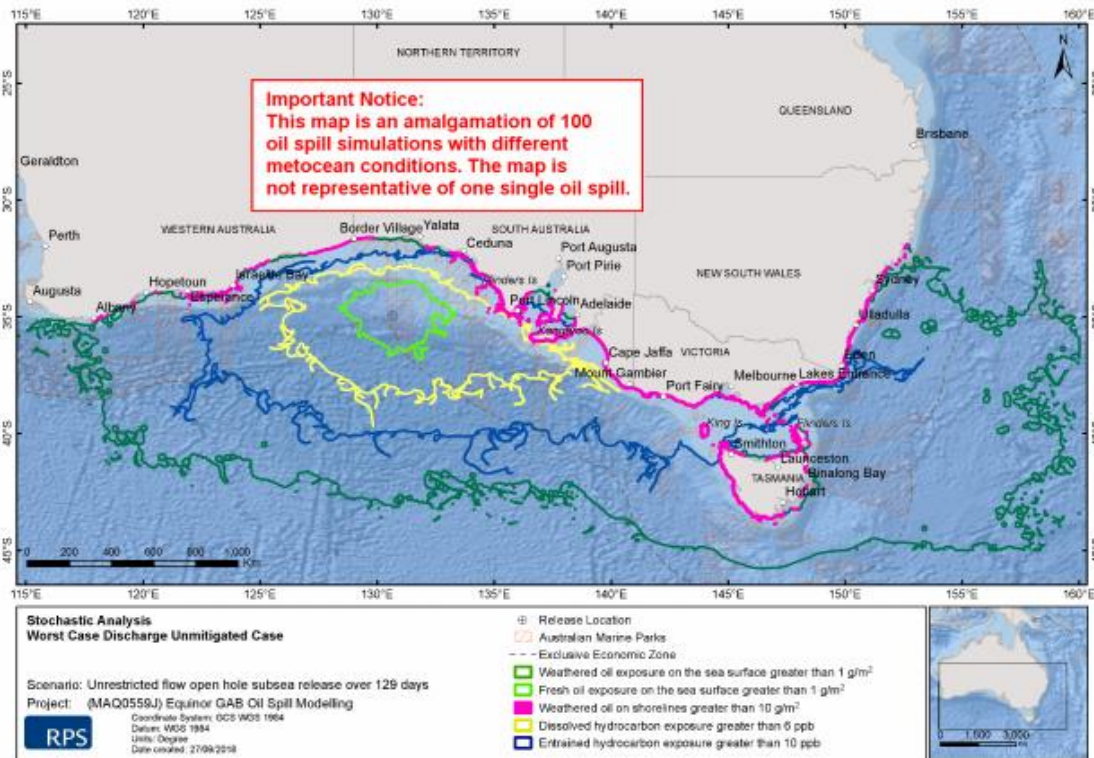
During summer (Figure 1) the prevailing currents would take the oil towards the Western Australian coastline. In winter (Figure 2) the oil could impact the Victorian west coast, King Island, and fisheries to the north west of Tasmania.

Equinor has also conducted oil spill modelling as part of its environment plan. While the Lebreton analysis above is more detailed, looking at surface oil of 0.1 gram/square metre and above, the Equinor analysis is restricted to surface oil of 1 gram/square metre and above. Even so, Figure 5 shows that worst-case oil spill scenarios could affect coastlines in Western Australia, South Australia, Tasmania, Victoria and New South Wales, with various degrees of oil exposure in most of Australia's southern and south-eastern waters.<sup>30</sup>

<sup>30</sup> Equinor (2019) *Environment plan Appendix 7-1 Oil spill modelling study (RPS): Stromlo-1 exploration drilling program*, p. 76, <https://www.equinor.com/en/where-we-are/gabproject/download-centre.html>



**Figure 5: Greatest extent of oil exposure on the surface, in-water and shoreline contact, produced from the results of 100 unmitigated simulations**



Note: This represents the greatest level of exposure for that location from 100 oil spill simulations. No single spill would necessarily be of this extent.

## SOUTH AUSTRALIA

In South Australia, the state most directly affected, employment from aquaculture in 2016–17 was 594 full-time equivalent positions, largely in the Eyre Peninsula.<sup>31</sup>

Commercial fisheries and aquaculture generated 1,536 direct jobs in 2016, the majority in regional areas.<sup>32</sup>

Tourism directly produced 8,900 jobs in 2018, excluding Adelaide and inland regions. Although it is difficult to determine what impact these industries might suffer from a

<sup>31</sup> Econsearch (2018) *The Economic Contribution of Aquaculture in the South Australian State and Regional Economies, 2016/17*, p. 10

<sup>32</sup> ABARES (2018) *Australian fisheries and aquaculture statistics 2017*, p. 28, <http://www.agriculture.gov.au:80/abares/research-topics/fisheries/fisheries-and-aquaculture-statistics>

spill, the approximately 10,436 direct jobs in regional “Bight” industries could be put at risk by the development of oil and gas extraction.<sup>33</sup>

**Table 2: Direct employment selected industries, South Australia**

Region	Direct jobs
<b>Tourism (regional)</b>	<b>8,900</b>
Fleurieu Peninsula	3,100
Limestone Coast	1,900
Eyre Peninsula	1,800
Yorke Peninsula	1,300
Kangaroo Island	800
<b>Aquaculture and commercial fisheries</b>	<b>1,536</b>
<b>Grand total</b>	<b>10,436</b>

Source: South Australian Tourism Commission (2019) *Regional Tourism Profiles*,  
<https://tourism.sa.gov.au/research-and-statistics/regions/regional-tourism-profiles>

194,000 people went whale and dolphin watching in South Australia in 2008, with most watching from land. The 10,000 boat-based and swim-with tourists likely contributed an outsized portion of the over \$1 million spent by watchers, in largely local-owned businesses. Indirect expenditure by whale and dolphin watchers was calculated as much higher, at \$14 million in 2008.<sup>34</sup>

## VICTORIA

Of Victoria’s 12 tourism regions, seven are coastal: the Great Ocean Road, Geelong and the Bellarine, Melbourne, Mornington Peninsula, Melbourne East, Phillip Island and Gippsland. The Great Ocean Road on Victoria’s western coast is closest to the site of Great Australian Bight drilling, and hosts significant coast-based tourism.

Tourism along the Great Ocean Road alone directly employs 8,300 people, which represents 13 percent of regional employment. Last year, 5.5 million visitors spent \$1.3 billion. The total gross regional product from tourism was \$994 million, or 15 percent of the economy.<sup>35</sup> In practice, an oil spill would also likely affect tourism in

<sup>33</sup> South Australian Tourism Commission (2019) *Regional Tourism Profiles*,  
<https://tourism.sa.gov.au/research-and-statistics/regions/regional-tourism-profiles>

<sup>34</sup> O’Connor, Campbell, Cortez, & Knowles (2009) *Whale watching worldwide: tourism numbers, expenditures and expanding economic benefits*, pp. 163, 171–172,  
[https://web.archive.org/web/20100304080937/http://www.ifaw.org/Publications/Program\\_Publications/Whales/asset\\_upload\\_file841\\_55365.pdf](https://web.archive.org/web/20100304080937/http://www.ifaw.org/Publications/Program_Publications/Whales/asset_upload_file841_55365.pdf)

<sup>35</sup> Business Victoria (2018) *Great Ocean Road Regional Tourism Summary*,  
<https://www.business.vic.gov.au/tourism-industry-resources/research/regional-visitation>



Victoria's other coastal tourism regions, but to be conservative only the figures for the Great Ocean Road region have been used here.

The Victorian fishing and aquaculture sectors employed 873 people in 2016.<sup>36</sup>

56,310 people went whale and dolphin watching in Victoria in 2008, with up to 37,190 watching from Warrnambool or Portland via the Great Ocean Road.<sup>37</sup>

In total, 9,173 Victorian jobs in coastal tourism, fishing and aquaculture could be put at risk by the development of oil and gas extraction.

## TASMANIA

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In the Lebreton analysis, modelled oil distribution in the 50 percent range does not meet the shoreline of Tasmania anywhere but King Island. The west coast of King Island is in the 60–70 percent range – that is, for a spill of the type modelled, there would be a 60–70 percent chance of oil reaching the island in quantities sufficient to cause socioeconomic impact, including the likely closure of fisheries.

The Tasmanian fishing and aquaculture sectors employed 2,113 in 2016.<sup>38</sup>

While Bass Strait is the area most likely to be impacted, the modelled oil spill could potentially bracket Tasmania, leaving only the east coast unaffected.

The Tourism and Transport Forum estimates tourism employment across Tasmania's 15 Legislative Council electorates. They calculate tourism employment in the five electorates along Tasmania's north and west coasts at 5,300, employed by 1,900 tourism-related businesses.<sup>39</sup>

24,245 people went whale or dolphin watching in Tasmania in 2008, although the two main watching sites are on the south-east of the island, which is less likely to be affected by a Great Australian Bight oil spill.

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<sup>36</sup> ABARES (2018) *Australian fisheries and aquaculture statistics 2017*, p. 28, <http://www.agriculture.gov.au:80/abares/research-topics/fisheries/fisheries-and-aquaculture-statistics>

<sup>37</sup> O'Connor et al. (2009) *Whale watching worldwide: tourism numbers, expenditures and expanding economic benefits*, pp. 163, 168–169

<sup>38</sup> ABARES (2018) *Australian fisheries and aquaculture statistics 2017*, p. 28

<sup>39</sup> Tourism & Transport Forum (2018) *Business Count and Employment Atlas Tasmania*, <https://www.ttf.org.au/business-count-and-employment-atlas/tas/>

In total, 7,413 Tasmanian jobs in northern coastal tourism, fishing and aquaculture could be put at risk by the development of oil and gas extraction.<sup>40</sup>

**Table 3: Direct employment selected industries, Tasmania**

Region	Direct jobs
<b><i>Tourism (regional)</i></b>	<b><i>5,300</i></b>
Mersey	1,000
Montgomery	1,000
Murchison	1,000
Rosevears	1,200
Windermere	1,100
<b><i>Aquaculture and commercial fisheries</i></b>	<b><i>2,113</i></b>
<b><i>Grand total</i></b>	<b><i>7,413</i></b>

Source: Tourism & Transport Forum (2018) *Business Count and Employment Atlas Tasmania*,  
<https://www.ttf.org.au/business-count-and-employment-atlas/tas/>

Across South Australia, Victoria and Tasmania, over 27,000 jobs could be put at risk by the development of oil and gas extraction in the Great Australian Bight.

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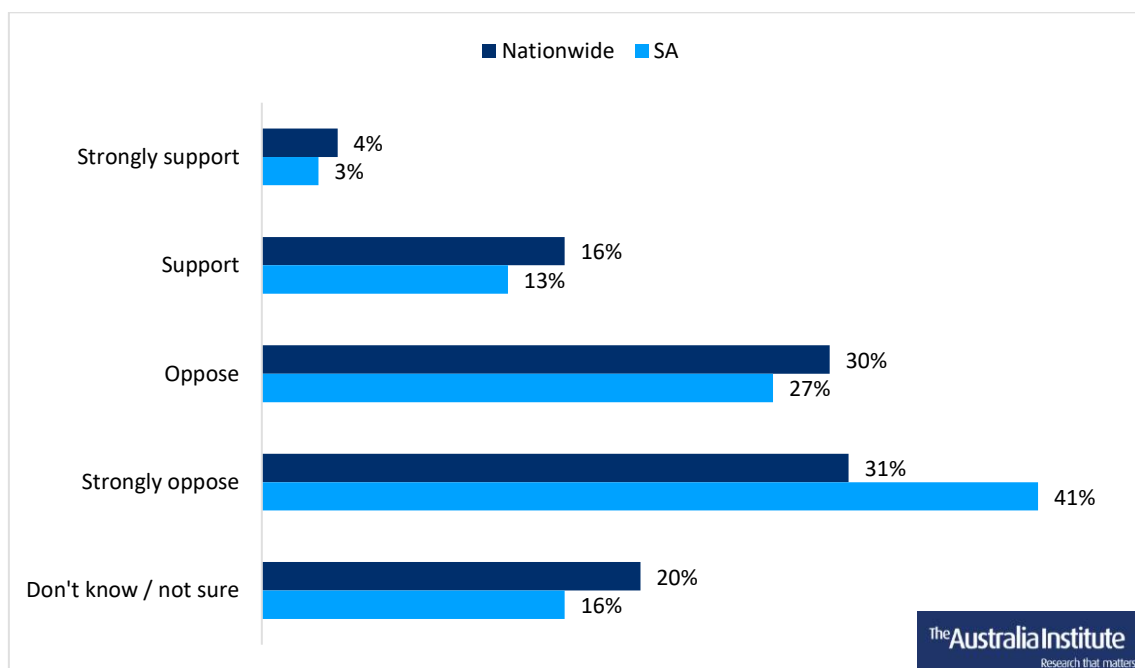
<sup>40</sup> O'Connor et al. (2009) *Whale watching worldwide: tourism numbers, expenditures and expanding economic benefits*, pp. 163, 170

# Popular opinion

In March 2019, The Australia Institute conducted representative national polling on drilling in the Great Australian Bight.

Nationwide, the rate of opposition to drilling was 60%. In South Australia the rate was higher at 68%. Just one in five people (20%) supported allowing oil drilling in the Bight nationally, with 16% support in South Australia.

**Figure 6: Do you support or oppose allowing companies to drill for oil in the Bight?**



Source: The Australia Institute (2019) *Polling – Great Australian Bight*,  
<https://www.tai.org.au/sites/default/files/Polling%20Brief%20-%20March%202019%20-%20Great%20Australian%20Bight%20final.pdf>

In July 2019, The Australia Institute undertook further representative national polling and asked what effect Australians thought drilling for oil would have on four socio-economic and environmental issues: jobs, fishing, tourism and the natural environment.

Most Australians think that companies drilling in the Great Australian Bight will have a positive effect on jobs (57%), with 14% thinking it would have a negative effect and the same number thinking it would have no effect.

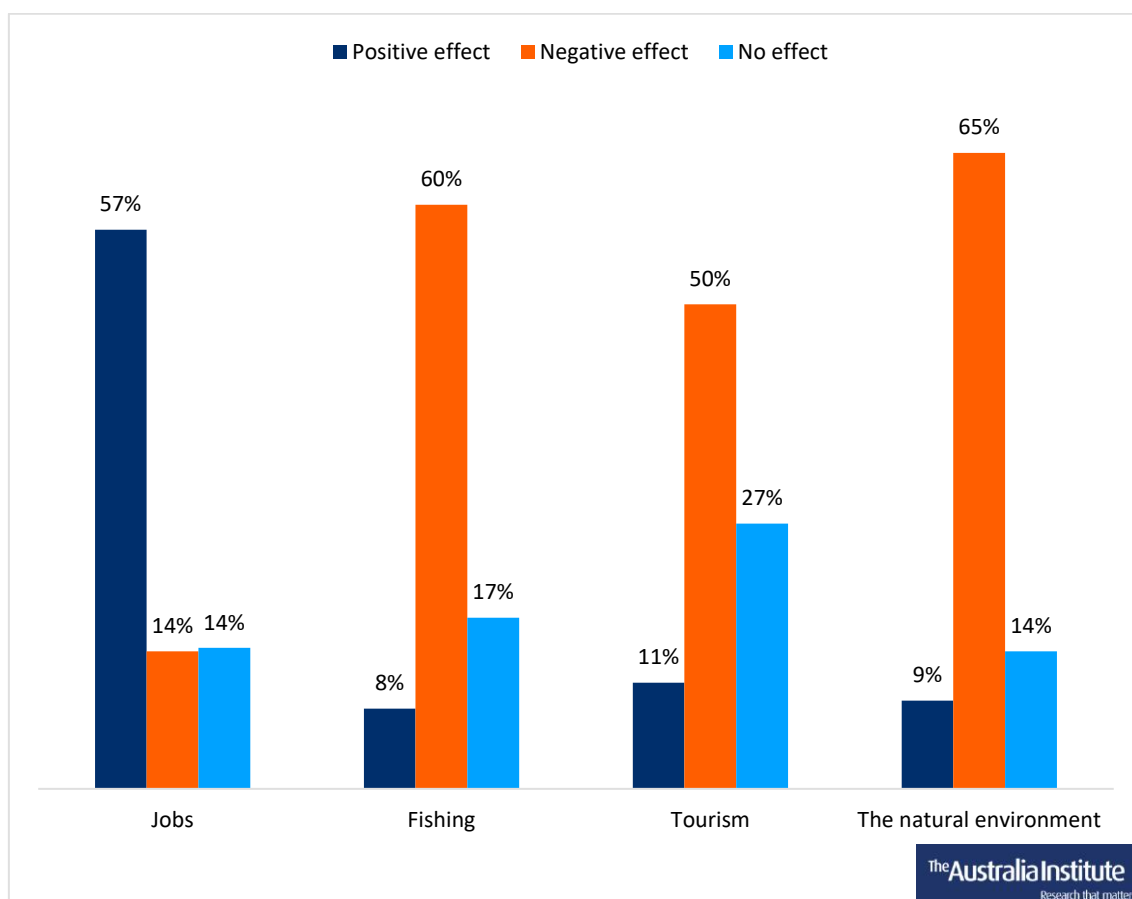
However, most Australians think the effect of drilling on fishing, tourism and the natural environment will be negative.

Three in five Australians (60%) think drilling in the Great Australian Bight will have a negative effect on fishing, more than seven times as many as think that it will have a positive effect (8%).

One in two Australians (50%) think drilling will have a negative effect on tourism, almost five times as many as think that it will have a positive effect (11%).

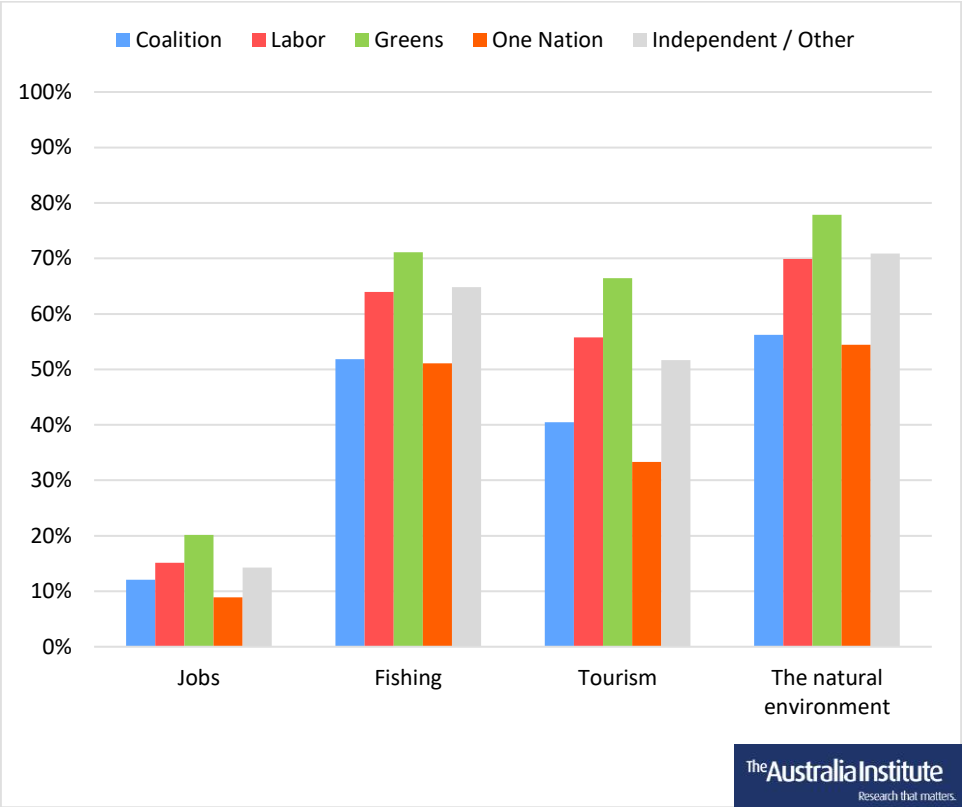
Two in three Australians (65%) think drilling will have a negative effect on the natural environment, compared to fewer than one in 10 (9%) who think it will have a positive effect.

**Figure 7: Effect of drilling in the Great Australian Bight by issue**



Coalition and One Nation voters were less likely to expect a negative effect, and Greens voters were more likely. Overall, however, concern was broadly similar across voters for each political party.

Figure 8: Drilling would have a negative effect on ..., by voting intention



# Conclusion

At a time when the world is working to address the damage that fossil fuels are causing the global climate, it seems incongruous to consider expanding oil and gas production into environmentally sensitive areas.

Nevertheless, the costs, benefits and risks of such proposals should all be considered. While proponents and parts of government are anxious to promote the “enormous” economic benefits of oil production, when viewed in the context of the state or national economy, such benefits are marginal. Oil and gas are capital intensive industries that employ few people. Those who would be employed are likely to be FIFO workers, rather than people who live in regional areas.

While oil and gas royalties can be important for state government budgets, decades of subsidy may be necessary before they can be enjoyed. Given the modest contribution of mining and gas royalties to the current South Australian budget, caution should be placed on such subsidies.

In contrast, locally owned, sustainable industries would be placed at risk by oil production in the Great Australian Bight. Tourism, fishing and aquaculture employ over 27,000 people in coastal areas that could be affected by an oil spill.

# Appendix 1: Polling

## Method

The Australia Institute conducted a national survey of 1,464 people between 23 July 2019 and 30 July 2019, online through Dynata (formerly Research Now) with nationally representative samples by gender, age, state and territory, and household income.

The margin of error (95% confidence level) for the national results is 3%.

Results are shown only for larger states.

Voting crosstabs show voting intentions for the lower house. Those who were undecided were asked which way they were leaning; these leanings are included in voting intention crosstabs, but results are also shown separately for undecideds. “LNP” includes separate responses for Liberal and National. “Other” includes Centre Alliance, Jacqui Lambie Network and Independent/Other.

## Detailed results

*What effect do you think companies drilling for oil in the Great Australian Bight would have on:*

### Jobs

	Total	Male	Female	NSW	VIC	QLD	WA
Positive effect	57%	61%	54%	58%	58%	58%	53%
Negative effect	14%	14%	14%	15%	12%	14%	16%
No effect	14%	15%	13%	13%	14%	15%	16%
Don't know / Not sure	14%	10%	19%	14%	16%	12%	14%

	Total	Coalition	Labor	Greens	One Nation	Other
Positive effect	57%	67%	53%	40%	72%	47%
Negative effect	14%	12%	15%	20%	9%	14%
No effect	14%	11%	15%	23%	9%	18%
Don't know / Not sure	14%	10%	17%	17%	10%	21%

### Fishing

	Total	Male	Female	NSW	VIC	QLD	WA
Positive effect	8%	10%	7%	7%	11%	9%	5%
Negative effect	60%	56%	63%	60%	60%	58%	54%
No effect	17%	23%	12%	19%	15%	16%	27%
Don't know / Not sure	15%	11%	18%	14%	15%	17%	14%

	Total	Coalition	Labor	Greens	One Nation	Other
Positive effect	8%	10%	8%	5%	8%	5%
Negative effect	60%	52%	64%	71%	51%	65%
No effect	17%	24%	14%	10%	23%	13%
Don't know / Not sure	15%	15%	13%	13%	18%	18%



## Tourism

	Total	Male	Female	NSW	VIC	QLD	WA
Positive effect	11%	13%	9%	11%	12%	10%	11%
Negative effect	50%	46%	53%	49%	51%	46%	49%
No effect	27%	31%	24%	28%	22%	34%	29%
Don't know / Not sure	13%	10%	15%	11%	16%	11%	11%

	Total	Coalition	Labor	Greens	One Nation	Other
Positive effect	11%	14%	10%	5%	11%	8%
Negative effect	50%	40%	56%	66%	33%	52%
No effect	27%	35%	21%	20%	41%	20%
Don't know / Not sure	13%	11%	13%	8%	14%	20%

## The natural environment

	Total	Male	Female	NSW	VIC	QLD	WA
Positive effect	9%	10%	8%	9%	11%	9%	6%
Negative effect	65%	61%	69%	66%	64%	62%	62%
No effect	14%	19%	10%	13%	12%	17%	21%
Don't know / Not sure	12%	10%	13%	12%	13%	12%	12%

	Total	Coalition	Labor	Greens	One Nation	Other
Positive effect	9%	10%	10%	8%	7%	5%
Negative effect	65%	56%	70%	78%	54%	71%
No effect	14%	20%	9%	8%	23%	11%
Don't know / Not sure	12%	13%	11%	6%	16%	13%

# The economic impacts of unconventional gas in Western Australia

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*WA's moratorium on fracking has been overturned without consideration of economic impacts.*

*Economic logic, and the lived experience of Queensland and the USA, shows the industry has an incentive to expand as much and as fast as possible.*

*This has a negative impact on communities, provides few jobs, little revenue and could increase domestic gas prices.*

Rod Campbell, Mark Ogge and Cameron Murray  
November 2018

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Tel: (02) 61300530

Email: [mail@tai.org.au](mailto:mail@tai.org.au)

Website: [www.tai.org.au](http://www.tai.org.au)

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# Summary

Western Australia's fracking moratorium has been overturned with little consideration of the likely economic and social impacts of developing an unconventional gas industry. Despite industry claims that it is looking to develop "small regional gas projects", proponents are boasting to investors of "world-scale" resources.

The USA has similar quantities of unconventional gas to WA. Since the development of US resources began in 2007, the production rate has grown to a scale about ten times more than Western Australia's output of LNG from offshore wells in 2017. Queensland coal seam gas (CSG) production has grown to four times the size of domestic gas use in Western Australia, and the rate of extraction is still rising. While the commercial viability of WA shale projects is uncertain, incentives point in the direction of large-scale development.

For established rural and agricultural communities, the social changes that come from rapid unconventional gas development are not always positive. A survey funded by gas companies in 2014 found that communities in Queensland's Darling Downs had predominantly negative views about the effect of the CSG boom on their region. Only around 6% of respondents thought that the community was "Changing to something different, but better", while the majority of respondents said they were "Resisting", "Not coping", or "Only just coping".

Oil and gas industries are capital intensive and employ relatively few people. Taking a broad definition of the gas industry, WA's 11,400 gas industry workers represent just 1 percent of employment in the state. Oil and gas extraction employs less people per dollar of value added than any other industry, including other parts of the resource sector. If employment growth is the policy goal, then investment in virtually any other industry is will deliver better results.

The Northern Territory Government's fracking inquiry commissioned economic research from regular gas industry consultants, ACIL Allen. ACIL estimated that gas extraction roughly equivalent to WA's current domestic supply would increase employment by just 524 jobs. They considered this a 'low to very low' probability outcome, with changes to employment between 80 and 200 more likely. Even if all jobs went to local people in WA's northern outback region, only a minor impact would be had on the regions 2,796 people unemployed.

Many of the region's unemployed are Indigenous. Indigenous people account for 3.7% of resource jobs industry wide. Based on this share of employment unconventional gas

in WA could be expected to create between three and 19 long-term jobs for Indigenous people.

Experience in Queensland suggests unconventional gas creates very few jobs in other industries. While construction and professional services do benefit, there was a loss of 1.8 agricultural jobs for every new gas job created.

Despite being a large producer and exporter of gas, petroleum royalties are a small part of WA State Government revenue. Petroleum royalties and related North West Shelf Grants make up just 2 percent of the \$29.5 billion state budget. In Queensland, the reality of unconventional gas royalties has been radically different from the picture given by the gas industry when they sought approvals for their projects. ACIL estimates in the NT show that even a best-case large shale gas industry would be likely to generate revenue worth just 0.6 percent of WA state government revenue. This is roughly equal to the value of traffic fines in the WA budget.

Relative to conventional gas, shale gas is high cost to extract. On the East Coast, high cost coal seam gas entered the production mix in 2015 and drove up the average cost of gas by 72%. AEMO expects supply from domestic-only gas facilities to decline and total contracted domestic supply to fall from 2020 to 2023. At this point AEMO expects WA domestic gas prices to rise and encourage further supply. If this supply comes from high-cost unconventional sources, prices will remain high. Especially if domestic gas suppliers are able to exert market power. Santos has just completed the acquisition of a significant supplier to the WA market, Quadrant Energy. Santos has used its position in the east coast market to intentionally increase domestic prices there.

The social and economic impacts of unconventional gas can be considerable. Given WA's role as a large conventional gas exporter there is little benefit in developing unconventional gas in the state.

# Introduction

Western Australia's moratorium on fracking has been overturned by the McGowan Government.<sup>1</sup> This decision was based largely on the findings of *the Independent Scientific Panel Inquiry into Hydraulic Fracture Stimulation in Western Australia* (the Inquiry). The Inquiry did not make detailed consideration of social or economic issues:

The scope of this Inquiry, and the EP Act, does not extend to considerations of harm to social or economic values that do not arise directly or indirectly from degradation, pollution or loss of physical or biological values. Thus, the Inquiry does not broadly extend to the future of the oil and gas industry in Western Australia, to considerations of the comparative impacts of oil and gas versus other energy sources, or to the consequences of resource development more generally. Neither does the Inquiry consider any social or economic benefits that hydraulic fracture stimulation might bring to the community.<sup>2</sup>

Given the controversy around the social and economic impacts of unconventional gas development in Queensland, the Northern Territory and overseas, this omission means that decision makers have little guidance on some of the issues of most concern to the WA community. This report considers some of these key issues:

- Likely scale of unconventional gas in WA
- Community impacts
- Employment impacts
- Revenue impacts
- Price impacts for WA businesses and households.

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<sup>1</sup> Newell (2018) Mark McGowan lifts moratorium on WA fracking, <https://thewest.com.au/business/energy/mark-mcgowan-lifts-moratorium-on-wa-fracking-ng-b881033600z>

<sup>2</sup> Independent Scientific Panel Inquiry into Hydraulic Fracture Stimulation in Western Australia (2018) *Final Report to the Western Australian Government*, p [https://frackinginquiry.wa.gov.au/sites/default/files/final\\_report.pdf](https://frackinginquiry.wa.gov.au/sites/default/files/final_report.pdf)

# Likely scale of a WA unconventional gas industry

Western Australia (WA) has extensive onshore unconventional gas resources, predominantly in the Canning and Perth Basins (**Error! Reference source not found.**) with 190,000 PJ to 300,000 PJ of estimated total resources.<sup>3</sup> This is substantially more than conventional gas resources and proved reserves of around 150,000 PJ.

Gas companies have explicitly noted that WA's unconventional gas could be exported through the North West Shelf hub, and that there is "substantial potential for export to global markets".<sup>4</sup> Buru Energy thinks big:

Buru Energy has identified and appraised a world scale tight wet gas resource that potentially offers long term energy security to Western Australia, significant contribution to Australia's GDP and socio-economic and employment opportunities for people and businesses in the local and regional community.<sup>5</sup>

However, when the gas industry lobbies for favourable government planning and environmental approvals they present the opposite story — that unconventional gas development would be for "small regional gas projects".<sup>6</sup>

Hence, a key question surrounding the development of shale or tight gas in WA is likely scale of development that would both a) cover establishment costs and b) be the profitable future production path for gas producers.

Simple economic analysis suggests that for a fixed capital investment in non-renewable resource extraction it is optimal to maximise the production rate to maximise profits, as long as the price is relatively stable. This is true even if the revenue does not cover the costs, as maximum production rates also minimise losses.

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<sup>3</sup> AEMO. (2017). *Gas Statement of Opportunities for Western Australia*. Australian Energy Market Operator Limited. p3. <https://www.aemo.com.au/Media-Centre/2017-WA-Gas-Statement-of-Opportunities>

<sup>4</sup> Thick, P. (2013). *Is this the future of domestic gas — Canning Basin?* New Standard Energy. [http://www.aie.org.au/AIE/Documents/PER130723\\_Presentation\\_2.pdf](http://www.aie.org.au/AIE/Documents/PER130723_Presentation_2.pdf)

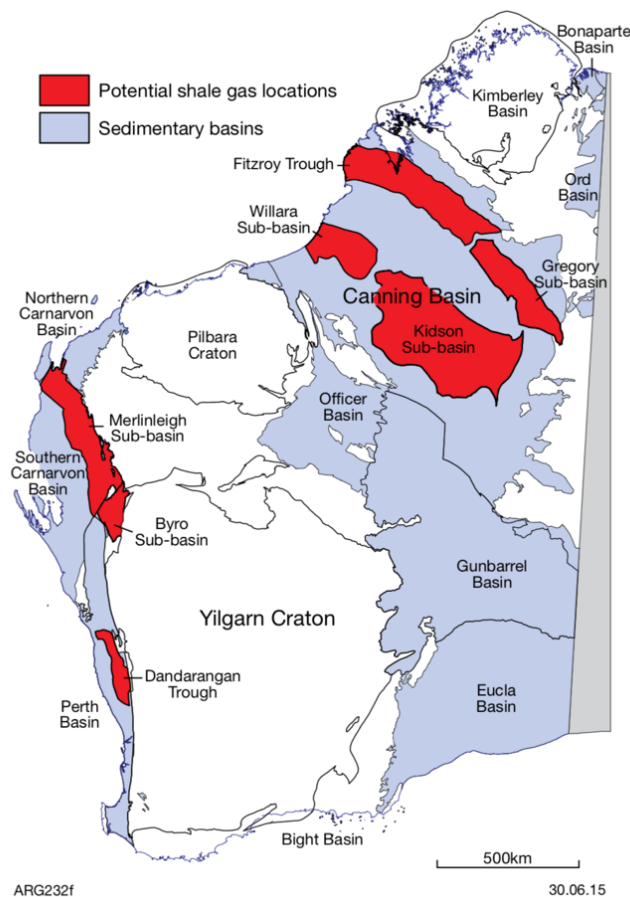
<sup>5</sup> Buru Energy (n.d.) *Gas*, <https://www.buruenergy.com/canning-basin/gas/>

<sup>6</sup> Doman, M. (2018). *Activism on gas projects is wasted energy*. APPEA. 19 September 2018. <https://www.appea.com.au/2018/09/activism-on-gas-projects-is-wasted-energy/>

The past decade's experience of shale gas development in the United States, and coal seam gas (CSG) in Queensland, are informative examples both of this economic motive in action, and of the likely scale of unconventional gas production in WA should this resource be developed.

With similar unconventional gas resources, United States shale gas production is ten times higher than WA's current offshore gas production. With much smaller CSG reserves, Queensland's gas production has grown to be nearly as high as WA's offshore gas production rate. Together these experiences suggest that if unconventional gas production is allowed to begin in WA the dominant economic incentive will be to scale quickly and supply export markets.

**Figure 1: Location of potential onshore unconventional gas**



Source: Government of Western Australia. (2015). *Guide to the Regulatory Framework for Shale and Tight Gas in Western Australia - A Whole-of-Government Approach 2015 Edition*.

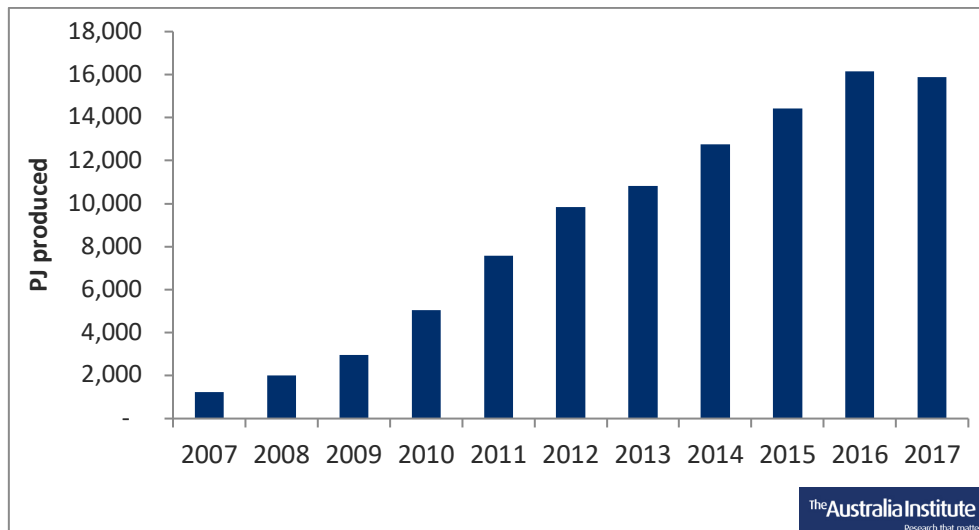
## The United States experience

This basic economic reality is on display in the United States shale gas industry, where similarly large reserves have been developed over the past decade. The shale gas



industry there is as a whole is unprofitable, despite amazing growth in gas production (see Figure 2).<sup>7</sup> High upfront capital costs were incurred during a period of high prices to develop the industry with reasonable economies of scale. But even as gas prices have fallen, the optimal reaction has been to maximise gas output to minimise losses on capital invested. This is a clear example of the economics at play— once capital is committed, maximising output on that capital is economically optimal.

**Figure 2: United States shale gas production**



Source: U.S. Energy Information Administration. (2018). Natural Gas— Shale gas.  
[https://www.eia.gov/dnav/ng/ng\\_enr\\_shalegas\\_dcu\\_NUS\\_a.htm](https://www.eia.gov/dnav/ng/ng_enr_shalegas_dcu_NUS_a.htm)

If future gas prices and regulatory settings change, a similar investment motive will be at play in Western Australia, and the United States experience can provide a good indicator of the likely scale production of unconventional gas development.

Proved reserves of shale gas in the United States are estimated to be over 200,000 PJ, or similar in scale to the natural endowment of tight gas in Western Australia.<sup>8</sup>

Since the development of these resources in the United States began in 2007, the production rate has grown to be around 17,000 PJ per year (see Figure 2). This production is about ten times more than Western Australia’s output of LNG from offshore wells in 2017, or about 45 times more than domestic gas consumption in Western Australia.

<sup>7</sup> Cunningham, N. (2018). *Here’s why the shale industry still isn’t profitable*. Business Insider. 1 Feb 2018.  
<https://www.businessinsider.com/shale-industry-not-profitable-irrational-production-2018-1/?r=AU&IR=T>

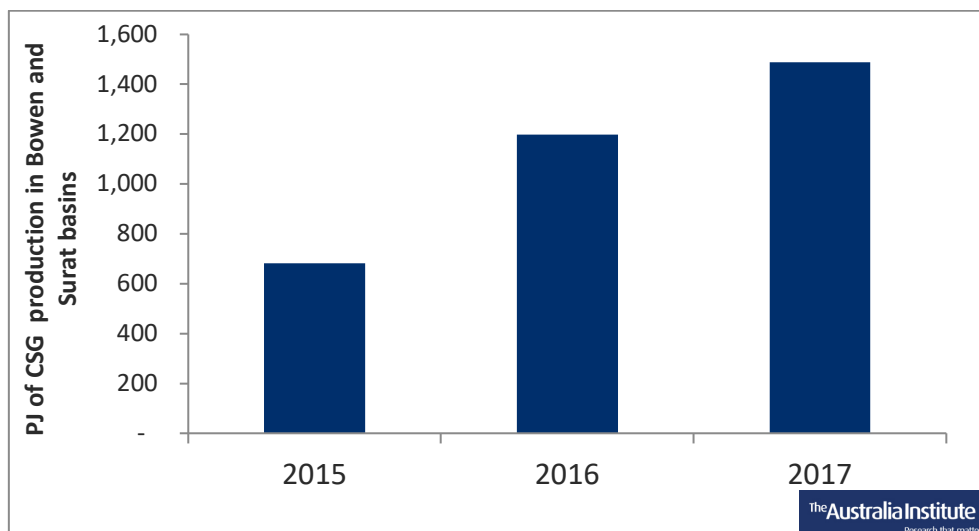
<sup>8</sup> U.S. Energy Information Administration. (2018). *Natural Gas— Shale gas*.  
[https://www.eia.gov/dnav/ng/ng\\_enr\\_shalegas\\_dcu\\_NUS\\_a.htm](https://www.eia.gov/dnav/ng/ng_enr_shalegas_dcu_NUS_a.htm)

There is no reason to think that the Western Australian shale gas experience would be much different from the United States experience— the resources are similar in magnitude, the economic motives are the same, and the same influence of global gas companies on ensuring generous regulatory controls will be felt politically.

## The Queensland coal seam gas experience

A similar development pattern happened in Queensland in the Surat and Bowen Basins. Coal seam gas (CSG) reserves of 37,000 PJ are now being extracted at a rate of 1,500 PJ per year (Figure 3) since these resources began development in the 2008-10 period. This production rate is four times larger than total domestic gas use in Western Australia, and the rate of extraction is still rising (as is it economically logical to do so).

**Figure 3: Queensland coal seam gas production**



Source: Queensland Government Data. (2018). *Petroleum and gas production and reserve statistics*. <https://data.qld.gov.au/dataset/petroleum-gas-production-and-reserve-statistics>

## Regional domestic use

Given the scale of unconventional gas resources and the economic incentives involved in extraction, development of new shale gas only for small-scale regional mining and electricity needs appears uneconomic.

In fact, the new reserved domestic gas supplies from offshore projects such as Woodside's Pluto project, and Chevron's Wheatstone project, have seen a rush to establish larger domestic markets by replacing shipping and mining fuel in order to

absorb this gas supply.<sup>9</sup> A Woodside spokesperson said earlier this year that “For now the market has significant excess of supply and capacity”.<sup>10</sup>

In short, there is considerable new gas coming to the Pilbara region from offshore gas in and around the North West Shelf (NWS). This gas is coming via established truck supply routes for the West Kimberley Power Project,<sup>11</sup> and will soon be coming via new truck supply routes to remote mining sites with gas from Woodside’s Pluto project.

It is not clear small-scale development of new shale gas fields in the region would make economic sense in an era of cheap domestic supply and existing investments in local distribution.

The experience of unconventional gas development in the United States and Queensland demonstrates a scale of development that reflects underlying economic incentives. With enormous possible unconventional gas resources, the likely scale of development of these resources in WA, if driven by economic considerations, will be a similar order of magnitude to WA’s current offshore gas production. All incentives point in the direction of large-scale development, and with this will come the influence of global gas companies on ensuring generous regulatory controls to allow it.

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<sup>9</sup> Stevens, M. (2016). *How Woodside plans to build a domestic market for its LNG*. AFR. 4 Dec 2016. <https://www.afr.com/business/energy/how-woodside-plans-to-build-a-domestic-market-for-its-lng-20161202-gt2vpo>

Construction has begun on truck-loading facilities.

<sup>10</sup> The Australian Pipeliner. (2018). Woodside plans Pluto expansion. 30 January 2018. <https://www.pipeliner.com.au/2018/01/30/woodside-plans-pluto-expansion/>

<sup>11</sup> <https://energydevelopments.com/casestudies/west-kimberley-power-project/>

# Community impacts

One way to assess the potential broader social and economic impacts from unconventional gas development is to look at the experience of Queensland, where coal seam gas (CSG) was rapidly developed in the 2012-15 period. Three main local effects from unconventional gas exploitation were noted: 1) conflict with agriculture; 2) community dissatisfaction; and 3) the boom and bust cycle.

The best research to date on the direct effect of CSG fields on agricultural output in Queensland's Surat Basin shows that agricultural revenues fell by 7% on average (in a study area of 11,500 Ha with 155 CSG wells).<sup>12</sup> This is necessary consideration when evaluating potential external costs of unconventional gas in the Perth basin wheatbelt, for example.

Additionally, studies of fracking in the United States have shown that the water use intensity necessary for fracking grows rapidly, with water use per well increasing 770% in the five years since 2011.<sup>13</sup> In general, there are agricultural conflicts with unconventional gas that are rarely acknowledged during early economic assessments, and which decrease the social value of exploiting the gas resources.<sup>14</sup>

For established rural and agricultural communities, the social changes that come from rapid unconventional gas development are not always desired. A survey funded by gas companies in 2014 showed that communities in Queensland's Darling Downs had predominantly negative views about the effect of the CSG boom on their region.<sup>15</sup> As shown in Figure 4 below, only around 6% thought that the community was "Changing to something different, but better", while the majority of respondents said they were "Resisting", "Not coping", or "Only just coping". Other results showed that most

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<sup>12</sup> Marinoni, O., & Garcia, J. N. (2016). *A novel model to estimate the impact of Coal Seam Gas extraction on agro-economic returns*. Land Use Policy, 59, 351-365.

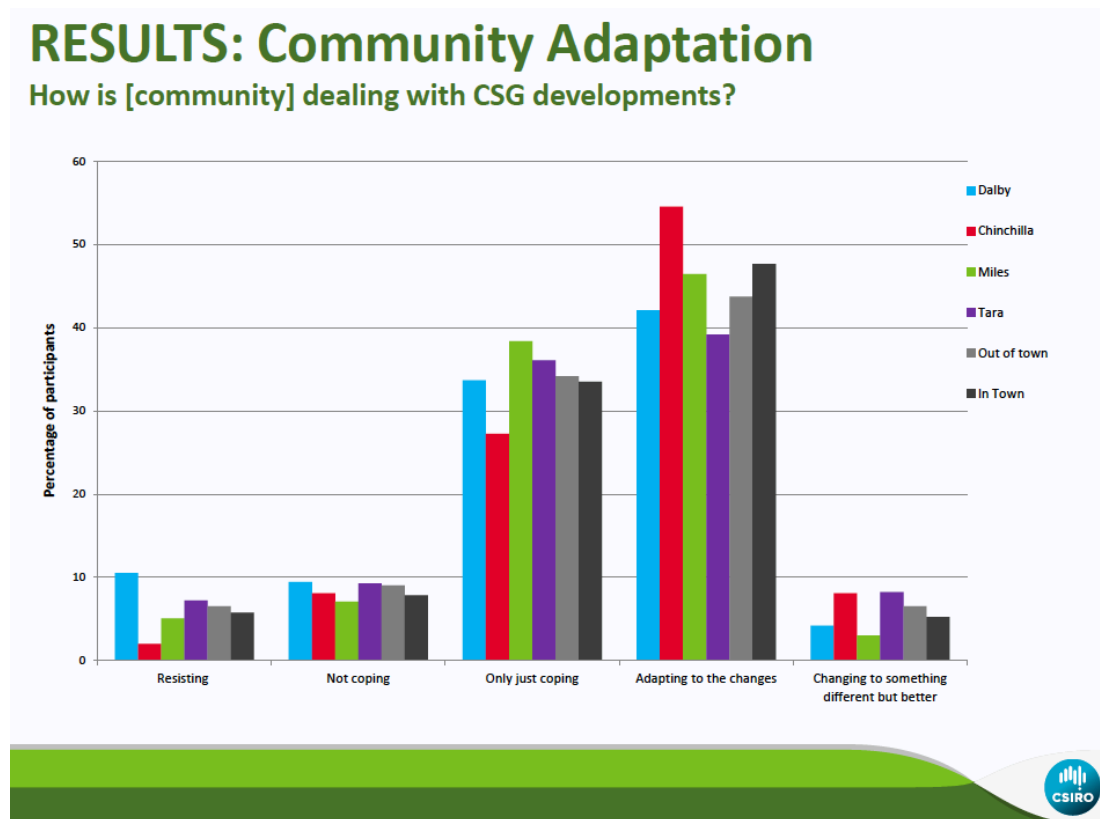
<sup>13</sup> Kondash et al. (2018). *The intensification of the water footprint of hydraulic fracturing*. Science Advances.

<sup>14</sup> Everingham, J. et. al. (2013). *Energy resources from the food bowl: an uneasy co-existence. Identifying and managing cumulative impacts of mining and agriculture*. Project report, CSRM, The University of Queensland. <https://www.csrn.uq.edu.au/publications/energy-resources-from-the-food-bowl-an-uneasy-co-existence-identifying-and-managing-cumulative-impacts-of-mining-and-agriculture>

<sup>15</sup> Walton, A. et. al. (2014). *CSIRO survey of community wellbeing and responding to change: Western Downs region in Queensland*. CSIRO Technical report: CSIRO, Australia. <https://gisera.csiro.au/wp-content/uploads/2018/01/CSIRO-survey-of-Community-Wellbeing-and-responding-to-change-Western-Downs-region-in-Queensland.pdf>

respondents said their attitude to coal seam gas was to “Tolerate” or “Accept” it, or with only 7% saying they “Embrace” it.

**Figure 4: Results of GISERA community survey gasfield region of Darling Downs QLD**



Source: Walton, A.et. al. (2014). CSIRO survey of community wellbeing and responding to change: Western Downs region in Queensland. CSIRO Technical report: CSIRO, Australia.

Other surveys have shown that there is a general view that the boom and bust cycle has a negative impact on social cohesion and “neighbourliness” due to absentee investors of property, vacant and dilapidated housing during the bust, and rapid change in the population.<sup>16</sup>

Lastly, the boom and bust construction cycle of CSG wells and pipelines in Queensland was extremely disruptive, leading to a temporary quadrupling of local housing rents and prices and boost in local wages that made it difficult for established small local businesses that were not suppliers to the gas industry.<sup>17</sup>

<sup>16</sup> Centre for Coal Seam Gas. (2018). *Annual Report on Queensland's Gasfields Regions*. University of Queensland. <https://boomtown-indicators.org/data-updates/western-downs>

<sup>17</sup> Fleming, D., and Measham, T. (2015). *Local economic impacts of an unconventional energy boom: the coal seam gas industry in Australia*. Australian Journal of Agricultural and Resource Economics, 59(1),

In Western Australia, further tying investment activity to the commodity price cycles is likely to accentuate similar cyclical effects that already happen but on a much larger state-wide scale.

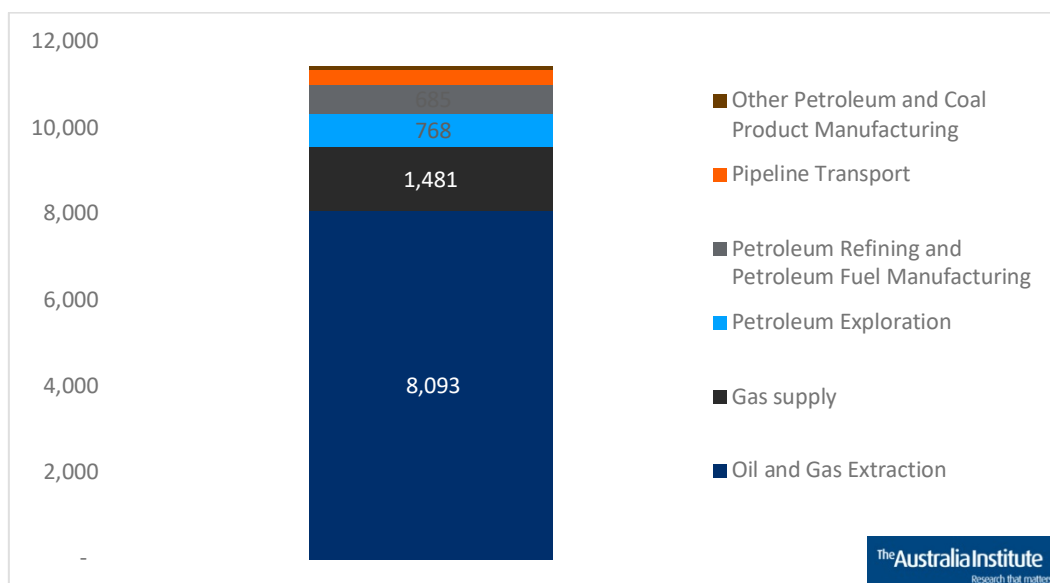
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78-94; Centre for Coal Seam Gas. (2018). *Annual Report on Queensland's Gasfields Regions*. University of Queensland. <https://boomtown-indicators.org/data-updates/western-downs>

# Jobs

Oil and gas industries are capital intensive and employ relatively few people. In WA around 8,000 people work in oil and gas extraction, 1,481 in gas supply (which includes household gas provision) with another 2,000 working in related industries such as refining (including LNG liquefaction), exploration and pipelines, as shown in Figure 5 below:

**Figure 5: WA employment in oil and gas related industries**

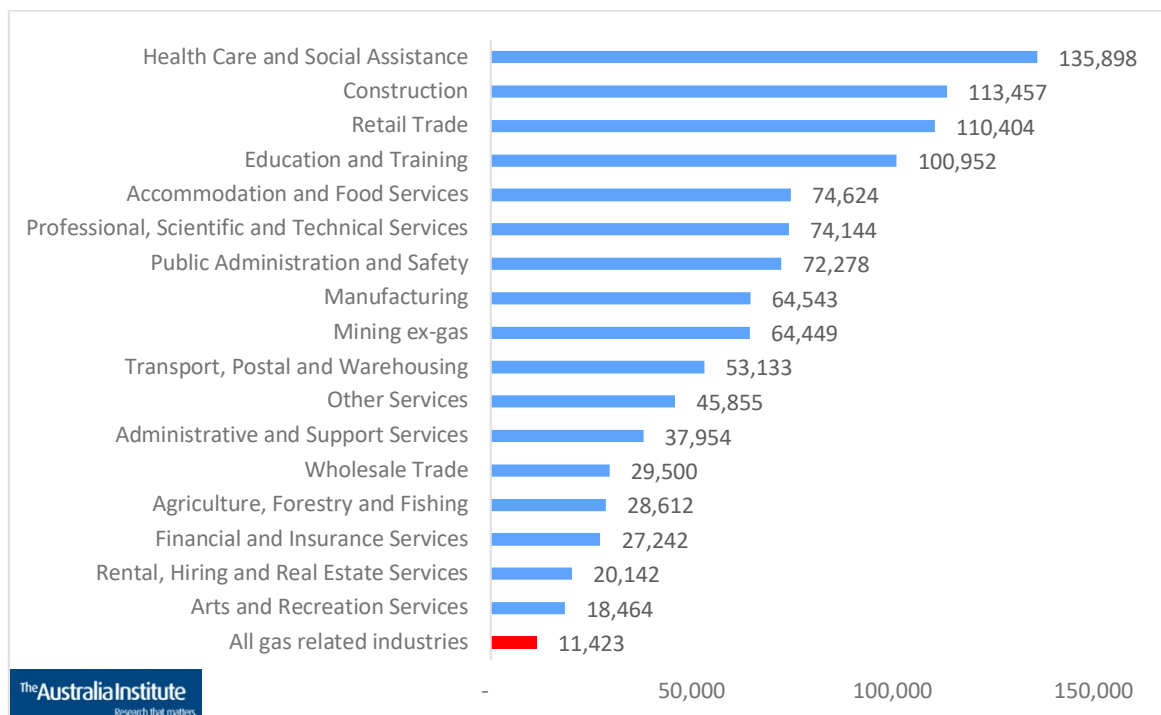


Source: ABS (2016) Census

While WA has the most people of any state working in oil and gas industries,<sup>18</sup> the industry represents only one percent of WA's 1.1 million people employed. Even taking a broad definition of the gas industry including household distribution, exploration and unidentified other manufacturing, the industry employs fewer people than arts and recreation, as shown in Figure 6 below:

<sup>18</sup> Using the Census industry categories above the WA total is 11,423. Queensland comes in next with nearly 8,800, followed by Victoria (5,260), NSW (3,407), SA (2,840), NT (863), Tasmania (227 – 130 in supply) and ACT (97 - 58 in supply). Source: ABS (2016) Census.

**Figure 6: WA employment by industry**



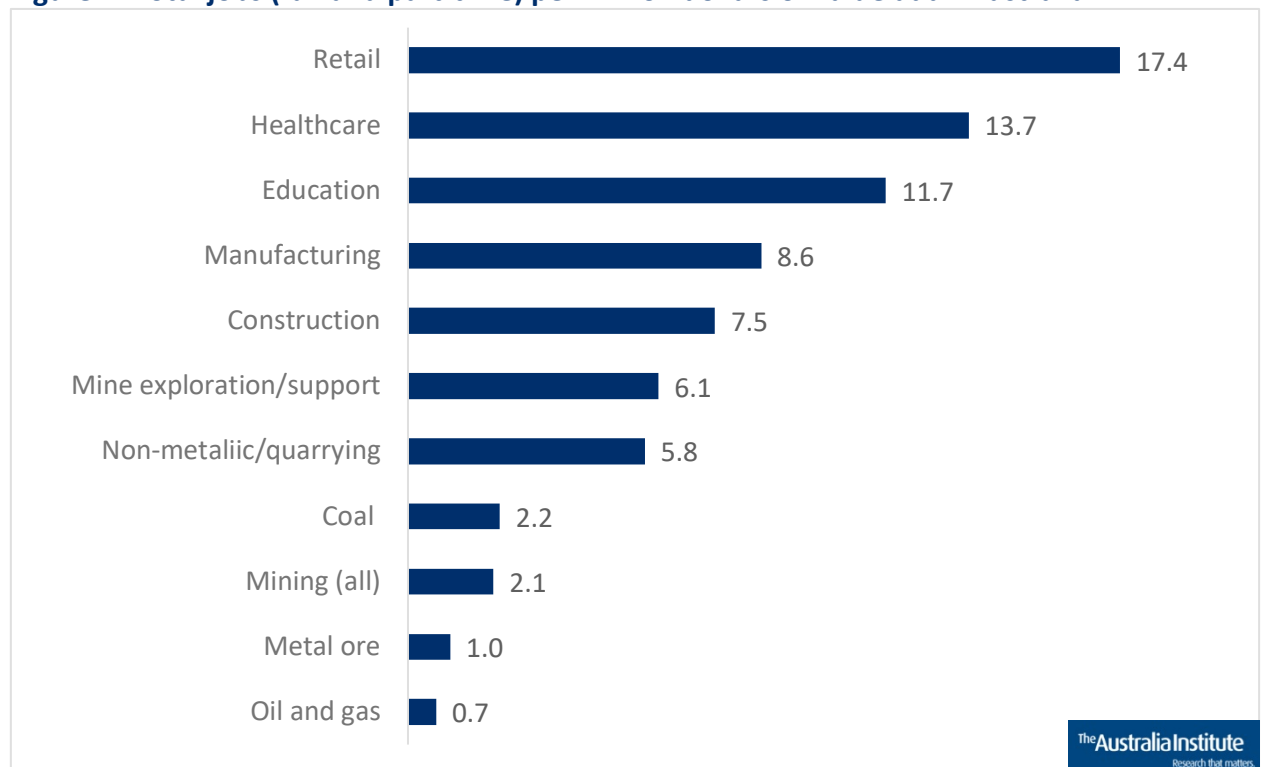
Source: ABS (2016) Census

Even compared to other natural resource extraction activities, the oil and gas industry employs very few people compared the value of the minerals extracted. In 2016 WA's gas industry produced \$12.8 billion worth of gas and petroleum products, while employing at most 11,423 people. In other words, \$1.1 million dollars' worth of gas was sold for every job in the industry.<sup>19</sup> Taking into account the inputs of each industry, oil and gas extraction employs less people per dollar of value added than any other industry, including other parts of the resource sector. If employment growth is the policy goal, then investment in virtually any other industry is will deliver better results. Figure 7 below compares the average number of jobs per million dollars of value added:

<sup>19</sup> Sources: as for Figure 3: Value of WA gas production and Census as for Figure X: WA employment in oil and gas related industries. 2016 is used as this was the census year. Note that the value of gas production increased by 20 percent in 2017. Assuming constant employment, this would have seen over \$5m of gas produced per job.



**Figure 7: Total jobs (full and part-time) per million dollars of value add - Australia**



Note: 2012-17 average for non-resource sectors, 2011-2015 for resource sub-sectors. Source: ABS (2018) 5204 Australian System of National Accounts, 2017-18 Table 5, <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/5204.02017-18?OpenDocumentABS> (Aug 2018) 6291.0.55.003 - Labour Force, Australia, Detailed, Quarterly, Table 4. <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6291.0.55.003Aug%202018?OpenDocument>; ABS (2016) Mining Operations Australia, <http://www.abs.gov.au/ausstats/abs@.nsf/mf/8415.0>

As shown in Figure 7, the construction sector creates 7.5 jobs per million dollars of value created (more than 11 times higher than oil and gas), while service sectors like education and healthcare employ between 10 and 20. A diverse economy needs to foster these sectors of the economy as well.

## Employment impact of a shale gas industry

The Northern Territory has just completed an inquiry into fracking, including economic assessment by consultants ACIL Allen, a consultancy that frequently works for the gas industry. Both WA and NT's unconventional gas reserves are in shale, as distinct from coal seams and of comparable resource size – up to 252,276 PJ in the NT and between

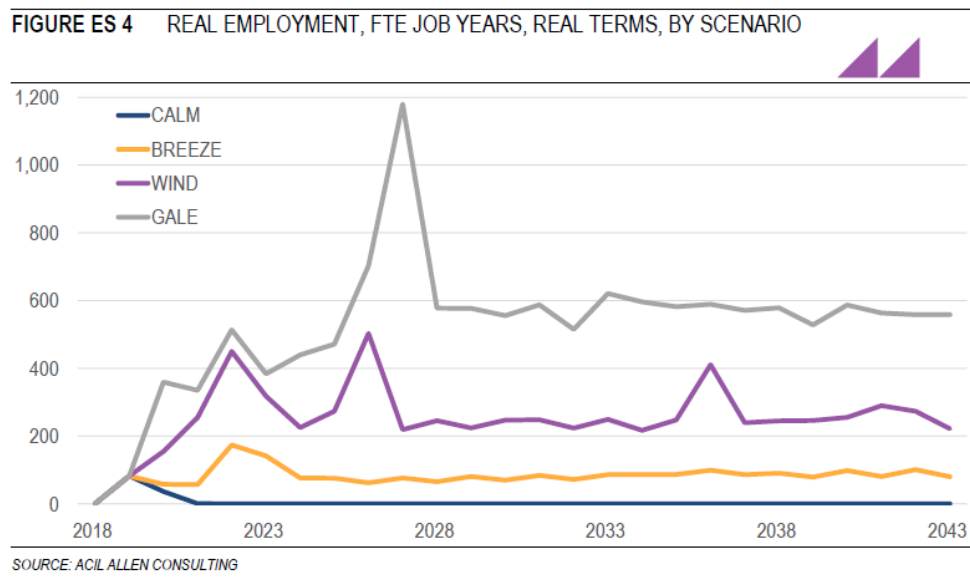
190,000 PJ and 300,000 PJ in WA.<sup>20</sup> ACIL's analysis makes it clear that there would be few additional jobs created by unconventional gas development.

Like WA, there is considerable uncertainty around the size of any potential unconventional gas industry in the NT. ACIL based their estimates around five different shale gas development scenarios:

- “Gale” – production of 1,000 TJ/day, similar to WA's recent domestic production. Considered low to very low probability.
- “Wind” – 400 TJ/day, similar to production of Karratha Gas Plant 2016-17. Considered moderate to low probability.
- “Breeze” – 100 TJ/day, similar to recent production at Devil Creek. Considered moderate to high probability.
- “Calm” – resource found not to be commercial without subsidy and no development takes place. Considered very high probability.

ACIL estimated the additional jobs in the NT economy in each year for these scenarios. Their results are reproduced in Figure 8 below:

**Figure 8: Employment by year, NT unconventional gas development scenarios**



<sup>20</sup> AEMO (2017) Gas Statement of Opportunities for Western Australia; ACIL Allen (2018) The economic impacts of a potential shale gas development in the Northern Territory, <https://frackinginquiry.nt.gov.au/inquiry-reports/final-report>

Source: ACIL Allen (2018) The economic impacts of a potential shale gas development in the Northern Territory, <https://frackinginquiry.nt.gov.au/inquiry-reports/final-report>

Figure 8 shows that the most likely outcome, ‘calm’ would lead to zero jobs, reflecting both the capital intensive nature of gas development and the financial uncertainty around unconventional gas in remote areas. At best ACIL estimated a spike in construction jobs in the late 2020s for one year, and the shale ‘gale’ bringing an average of 524 jobs. The most likely production scenario ‘breeze’ would see an average of 80 more jobs in the NT economy. The ‘wind’ scenario would see an average increase of 252 jobs.

To put this in context, there are 84,800 unemployed people in Western Australia.<sup>21</sup> The increase in employment estimated by ACIL would represent a fraction of one percent of the state’s unemployment. In the ABS’s Outback (North) region, where most WA fracking would occur, there were 2,796 people unemployed and looking for work at the time of the 2016 Census. Even if all new jobs went to local people, the most likely production scenario would employ 80 people, less than 3% of the people unemployed in Outback (North). This is of course highly unlikely given the fly-in-fly-out nature of the gas industry and the skills required. Many of these people are Indigenous, at particular disadvantage and most unlikely to secure employment in the unconventional gas industry.

## Indigenous employment claims

A focus of discussion around unconventional gas in WA has been the potential for jobs for Indigenous people. Buru Energy claims on its website to have strong relationships with Traditional Owners and to have implemented:

- *Training of personnel in security, the operation of excavators, water carts, dump trucks, front-end loaders and bobcats.*
- *Employment of over 30 Traditional Owners during our recent exploratory frac program near Noonkanbah Station with over 13,500 hours of paid employment undertaken by community members during the three-month program.*<sup>22</sup>

Such initiatives are to be commended. The long-term record of the resource industry is less impressive, particularly once operations pass construction phase and the need for

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<sup>21</sup> ABS (2018) 6202.0 - Labour Force, Australia, October 2018, <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6202.0October%202018?OpenDocument>

<sup>22</sup> Buru Energy (n.d.) Traditional Owners, <https://www.buruenergy.com/corporate-responsibility/traditional-owners/>

excavators, dump trucks, other equipment and people to guard them. The ABS estimates that 6,654 indigenous people work in all parts of the mining and resource industry, 3.7 percent of the 177,640 total. Far more Indigenous people work in Health care, public administration, education, construction, retail, and other service industries.<sup>23</sup> Separate statistics for the gas industry are not available.

Applying the industry's Indigenous employment share to the likely increase in employment in NT's production scenarios modelled by ACIL, sees:

- Breeze – 82 jobs total x 3.7% = 3 jobs
- Wind – 252 jobs total x 3.7% = 9 jobs
- Gale – 524 jobs total x 3.7% = 19 jobs

In summary, if a WA shale gas industry is economically viable, based on general Indigenous employment in Australia's resource industries, the most likely outcome is an increase in indigenous employment of between three and nine full time equivalent jobs (FTE). At best, with production that doubled WA's recent domestic production an estimated increase of 19 indigenous jobs would be expected.

## Employment impacts on other industries

While the unconventional gas industry certainly employs some people, there are very few flow-on jobs outside the gas industry itself, and many of these jobs are come at the cost of displacement of jobs in other industries.

Most industries increase and decrease gradually over time, allowing other industries and the economy as a whole to adjust. However large gas and LNG projects ramp up quickly and require a large skilled workforce, goods and services for a short period of time. Because the economy has finite productive resources such as skilled labour, services and capital, a sudden surge in demand for these will drive up prices for other industries which can be very disruptive and cause a contraction in output and jobs in these industries, particularly manufacturing and agriculture.

Queensland has the only large unconventional gas industry operating in Australia. While there are geological differences between coal seam gas that is being extracted in Queensland and shale and tight gas in Western Australia, the infrastructure and employment requirements are similar. Both require a large number of wells drilled

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<sup>23</sup> ABS (2016) Census and ABS (2017) Aboriginal and Torres Strait Islander Census: Industry, <http://www.abs.gov.au/ausstats/abs@.nsf/MediaReleasesByCatalogue/142C08A784A1B5C0CA2581BF001EE22C?OpenDocument>

over vast areas, both require fracking and have similar construction and operational workforce requirements.

As such much can be learned from the Queensland unconventional gas experiment about the likely social and economic impacts of unconventional gas development in Western Australia.

Detailed analysis of the flow-on employment impacts of in Queensland's gas fields has been undertaken by the Gas Industry Social and Environmental Research Alliance (GISERA).<sup>24</sup> As shown in Figure 9 below, the research found that there was virtually no flow on jobs to outside of the gas industry itself:

**Figure 9: Coal seam gas employment spillover over different sectors**

	Elasticity	Additional job for each new CSG job
Local goods sector		
Construction	0.832 (0.426) *	1.414
Professional services	0.704 (0.259) **	0.422
Retail trade	0.011 (0.140)	0.024
Accommodation and food services	0.375 (0.263)	0.471
Other services	-0.385 (0.247)	-0.890
Tradable goods sector		
Manufacturing	0.068 (0.199)	0.160
Agriculture	-0.314 (0.182) *	-1.790
<b>Notes</b>		
* $P < 0.10$ ; ** $P < 0.05$ . Elasticity values are two-stage least square estimations for coefficient $\beta$ in equation (2). The number of CSG wells in an statistical local area is used as instrument for the log change of mining employment. Values are estimated using sample 3 ( $n = 48$ ). $F$ -stat first-stage = 10.74. Robust clustered standard errors at Local Government Area levels are in parentheses. Other services sector includes employment in the Australian Bureau of Statistics categories of rental agencies, transport and 'other services'.		

Source: Fleming M and Measham T (2015a) Local economic impacts of an unconventional energy boom: the coal seam gas industry in Australia, *The Australian Journal of Agricultural and Resource Economics*.

<sup>24</sup> Fleming M and Measham T (2015a) Local economic impacts of an unconventional energy boom: the coal seam gas industry in Australia, *The Australian Journal of Agricultural and Resource Economics*, 59(1), pp. 78–94 <https://onlinelibrary.wiley.com/doi/abs/10.1111/1467-8489.12043>

Figure 9 shows that and that there was a loss of 1.8 agricultural jobs for every new gas job created. The sector that received the most significant amount of receive spillover jobs is construction, with 1.4 additional jobs for every new gas job.

However, these jobs are short term. As the Western Australian Department of Mines and Petroleum notes, in the Western Australian LNG industry as a whole, nine out of ten jobs disappear after the construction phase:

Generally, after the construction phase, only one in 10 LNG jobs is retained, compared with one in three iron ore jobs.<sup>25</sup>

The large fluctuations in construction employment also cause displacement of jobs in other sectors. Sometimes resource companies publish tables of modelling for the employment impacts of their projects in their economic impact assessments. One example is economic modelling by the Queensland unconventional gas company Arrow LNG. As shown in Figure X below, Arrow's modelling estimated that the development of this single project would displace 680 manufacturing jobs in Queensland as a whole including over 200 in the local Darling Downs region between 2019-20 to 2027-28, as well as a significant amount of agricultural jobs.<sup>26</sup>

**Figure x: Arrow LNG modelling for Economic Assessment of Surat Gas Project.**

Industry	Darling Downs		Queensland	
	2013-14 to 2018-19	2019-20 to 2027-28	2013-14 to 2018-19	2019-20 to 2027-28
Agriculture, forestry and fishing	-56	-52	-68	-66
Mining	180	431	209	494
Manufacturing	-112	-226	-457	-680
Electricity and water	-14	-19	-148	-130
Construction	315	160	334	197
Trade	53	81	36	59
Transport and storage	-9	-18	-34	-47
Business, finance and insurance services	88	39	299	242
Public administration, defence, health and education	-50	-47	-6	34
Recreation and other services	-11	-18	-5	-11
Ownership of dwellings	0	0	-1	-1
<b>Total Change in Employment (FTEs)</b>	<b>384</b>	<b>332</b>	<b>158</b>	<b>92</b>

Source: Prime Research (unpublished).

Source: AEC (2011) Economic Impact Assessment: Surat Gas Project, Table 5.2 p.50

<sup>25</sup> Government of Western Australia Department of Mines and Petroleum (2016) *Statistics Digest 2015-16*, [http://www.dmp.wa.gov.au/Documents/About-Us-Careers/Stats\\_Digest\\_2015-16.pdf](http://www.dmp.wa.gov.au/Documents/About-Us-Careers/Stats_Digest_2015-16.pdf)

<sup>26</sup> AEC (2011) Economic Impact Assessment: Surat Gas Project, Table 5.2 p.50, [https://www.arrowenergy.com.au/\\_\\_data/assets/pdf\\_file/0006/28734/Appendix20020-20Economic20Impact20Assessment.pdf](https://www.arrowenergy.com.au/__data/assets/pdf_file/0006/28734/Appendix20020-20Economic20Impact20Assessment.pdf)

# Revenue from unconventional gas

Despite being a large producer and exporter of gas, petroleum royalties are a small part of WA State Government revenue. Petroleum royalties and related North West Shelf Grants make up just 2 percent of the \$29.5 billion state budget. Iron ore royalties by contrast are worth more than \$4 billion per year, 14 percent of the budget.<sup>27</sup>

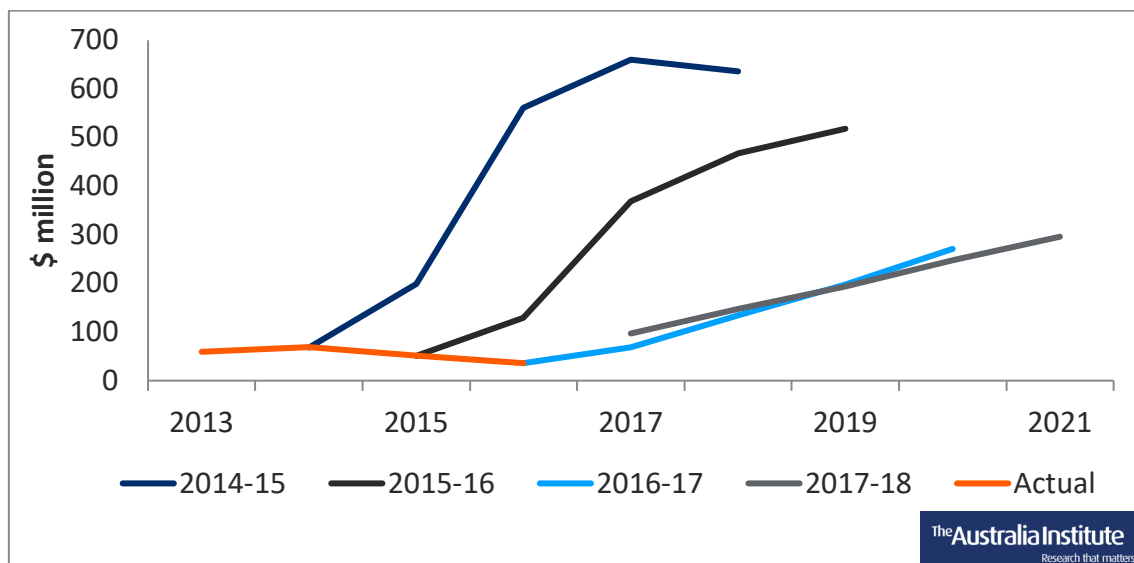
The relatively high cost of unconventional gas has two important implications. First, it means that projects are high risk and have a high chance of commercial failure during gas price fluctuations. Second, the high costs mean that profit-based royalty regimes and fixed-rate royalty regimes that apply to wellhead value-added measures, will generate little revenue for governments. Even royalties from conventional offshore gas in Western Australia have been falling due to new projects being higher cost ones, suggesting that onshore unconventional gas is unlikely to generate royalty windfalls.

In Queensland, the reality of unconventional gas royalties has been radically different from the picture given by the gas industry when they sought approvals for their projects. Figure 10 shows the ambitious forecasts of the Queensland government of royalty revenue based on gas industry information versus the ultimate reality. The promises were over ten times the reality in 2017.

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<sup>27</sup> See Murray et al (2018) *Pipeline: Gas and the WA economy for more details*. Also see WA Treasury (2018) *Budget papers*, <https://www.ourstatebudget.wa.gov.au/budget-papers.html>

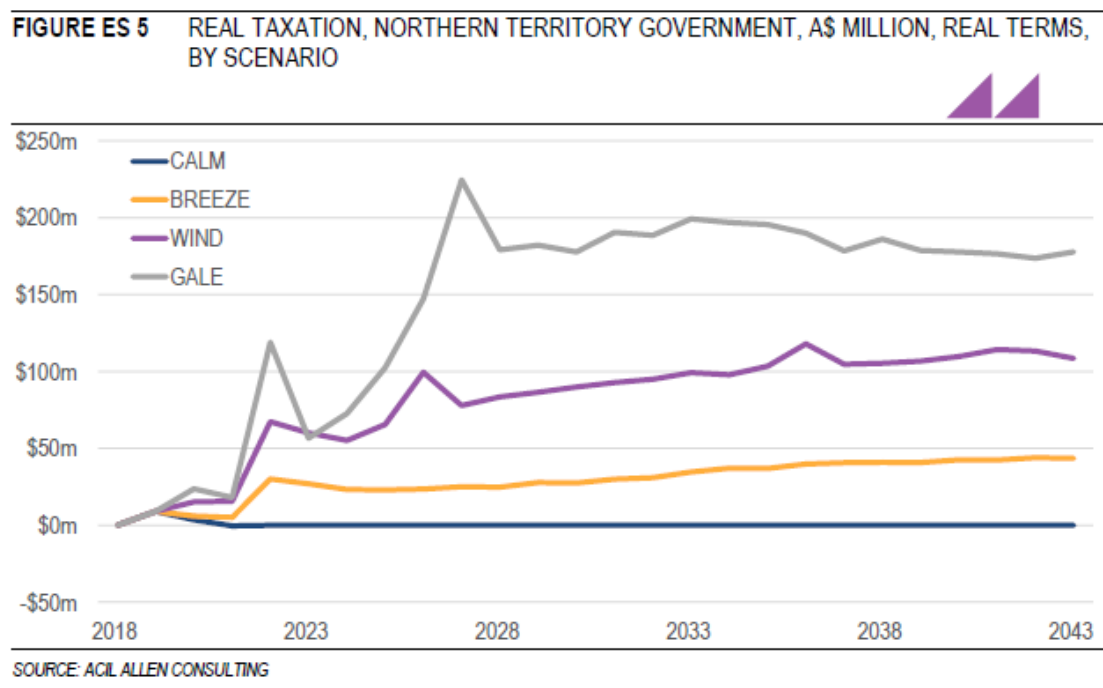
**Figure 10: Queensland's forecast and actual budget royalties**



Queensland Government. (2018). *Budget Papers (and historical)*. <https://budget.qld.gov.au>

The economic consultants to the NT Fracking Inquiry came to a similar conclusion. In their best case scenario by the late 2020s a major shale gas industry would increase NT government revenue (before any GST adjustment by the commonwealth) by around \$200 million, as shown in Figure 11 below:

**Figure 11: Shale gas impact on budget revenue by year**





Source: ACIL Allen (2018) The economic impacts of a potential shale gas development in the Northern Territory, <https://frackinginquiry.nt.gov.au/inquiry-reports/final-report>

In context, Figure 11 shows that even a best-case large shale gas industry would be likely to generate revenue worth just 0.6 percent of WA state government revenue. This is roughly equal to the value of traffic fines in the WA budget.<sup>28</sup>

The more likely Breeze and Wind scenarios would see revenue increases limited mainly to less than \$100m per year, a third of one percent of WA state revenue.

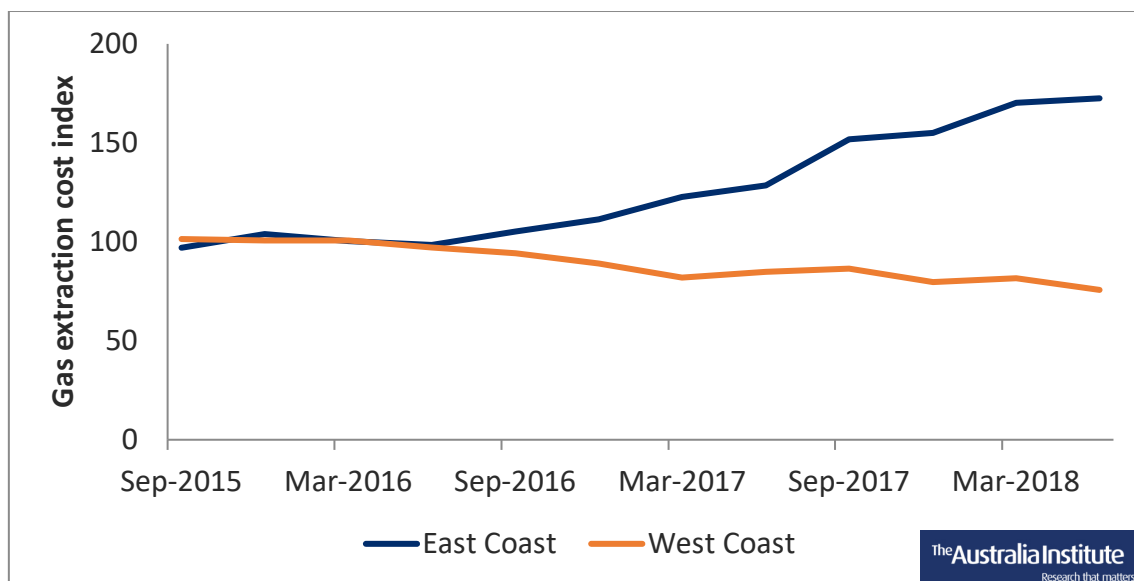
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<sup>28</sup> WA Treasury (2018) Budget Papers, see p212, Table 2.1.  
<https://www.ourstatebudget.wa.gov.au/2018-19/budget-papers/bp3/2018-19-wa-state-budget-bp3.pdf>

# Gas prices for WA businesses and households

One of the main features that differentiates onshore unconventional gas from established gas resources is its higher cost. On the East Coast, high cost coal seam gas entered the production mix in 2015 and drove up the average cost of gas production. As shown Figure 12, the effect has been to increase the average production cost of gas by 72%. At the same time in Western Australia, economies of scale from established and new large-scale offshore projects have reduced the cost by 18%. Compared to 2015 costs, East Coast gas now costs 230% more on average to produce than west coast gas.

**Figure 12: Comparison of East and West Coast gas production costs**



Source: ABS. (2018). *6427.0 - Producer Price Indexes, Australia, Jun 2018*. Table 36. Australia Bureau of Statistics.

<http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6427.0Jun%202018?OpenDocument>

The prohibitive cost profile of unconventional gas has been observed to be one of the main reasons that onshore unconventional gas projects had not been developed in Western Australia, despite a global trend towards such gas resources:

Given the amount of conventional gas resources remaining, and the relatively high cost of developing unconventional gas, there has been no commercial production of unconventional gas in WA.<sup>29</sup>

In macroeconomic terms, devoting labour and capital resources to high-cost ways of producing goods that are already a major part of the economic base further reduces the diversity of Western Australia's economy and ties its fortunes even tighter to global commodity cycles. Most resource rich regions are using the revenues raised from their energy resource endowments to shift their economies into new industries.

Much of the reason east coast gas prices have risen in recent years has been linking the east coast market to the world market through LNG export terminals in Gladstone, Queensland. WA's domestic gas reservation policy has kept prices for WA users lower than the east coast despite large export facilities. However, AEMO expects supply from domestic-only gas facilities to decline and total contracted domestic supply to fall from 2020 to 2023. At this point AEMO expects WA domestic gas prices to rise and encourage further supply.<sup>30</sup>

If this supply comes from high-cost unconventional sources, prices will remain high. Especially if domestic gas suppliers are able to exert market power. Santos has just completed the acquisition of a significant supplier to the WA market, Quadrant Energy.<sup>31</sup> Santos has used its position in the east coast market to increase domestic prices there, as the company told analysts in 2014:

Santos now argues that its aim in GLNG was always as much about raising the domestic gas price, and therefore re-rating large parts of the portfolio outside of GLNG, as it was about the project. Even if this was the case, with the shortage of gas being seen at QCLNG, and APLNG busy feeding itself, we wonder if GLNG was needed to see net back pricing domestically. What is more, with a ~0.8% drag on Australian GDP from every \$2/GJ rise in the domestic gas price, this view certainly wouldn't have been terribly popular with politicians who approved the project.<sup>32</sup>

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<sup>29</sup> AEMO. (2017). Gas statement of opportunities for Western Australia. p23. 3

[https://www.aemo.com.au/-](https://www.aemo.com.au/-/media/Files/Gas/National_Planning_and_Forecasting/WA_GSOO/2017/2017-WA-GSOO.pdf)

[/media/Files/Gas/National\\_Planning\\_and\\_Forecasting/WA\\_GSOO/2017/2017-WA-GSOO.pdf](https://www.aemo.com.au/-/media/Files/Gas/National_Planning_and_Forecasting/WA_GSOO/2017/2017-WA-GSOO.pdf)

<sup>30</sup> AEMO (2017) p4.

<sup>31</sup> Santos (2018) Santos completes acquisition of Quadrant Energy, <https://www.santos.com/media-centre/announcements/santos-completes-acquisition-of-quadrant-energy/>

<sup>32</sup> Credit Suisse (2014) Santos: The seven year itch?, [https://www.gabpg.org.au/wp-content/uploads/2014/06/Credit\\_suisse\\_report110314.pdf](https://www.gabpg.org.au/wp-content/uploads/2014/06/Credit_suisse_report110314.pdf)

While further analysis should be conducted around the likely impact on gas supply and price, high-cost gas supplied by companies with market power into a market with declining supply appears likely to increase prices.

# Conclusions

Unconventional gas has typically failed to deliver the sustained local economic prosperity it promised where it has been established. It is unlikely the situation would be any different in Western Australia.

What makes Western Australia different from other areas is that it, a) already hosts a large, low-cost, established gas industry, and b) has a gas reservation policy that currently provides reliable local supply even when global prices would otherwise attract gas producers to export gas instead, and c) already has an economy heavily impacted by energy and mineral exports.

These factors mean that establishing new high cost energy sources, such as unconventional shale or coal seam gas, reduce the average cost advantage to the resource industry while at the same time binding Western Australia's economy more closely to global commodity price cycles.

The gains in terms of potential ongoing employment opportunities from developing unconventional gas as small as the petroleum sector in general is a small employer even compared to its value added, even in relation to other resource sectors.

Because unconventional gas will be higher cost gas the royalty revenues per unit of production will be lower than for offshore gas. Notably, gas is already a relatively low royalty earner in the resources sector compared to the value of the resource.

In all, Western Australia could improve its economic outlook and long-term stability by diversifying away from the resources sector to more labour-intensive sectors of the economy, rather than invest in high cost additional resource extraction activities.

# We'll pay tax ....one day

## Submission to Senate Inquiry into Corporate Tax Avoidance

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*Oil and gas companies often commission economic reports to claim future tax revenues will be large. These forecasts are based on modelling that is unreliable and not transparent.*

Rod Campbell  
Tony Shields  
February 2018

## **ABOUT THE AUSTRALIA INSTITUTE**

The Australia Institute is an independent public policy think tank based in Canberra. It is funded by donations from philanthropic trusts and individuals and commissioned research. Since its launch in 1994, the Institute has carried out highly influential research on a broad range of economic, social and environmental issues.

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As we begin the 21st century, new dilemmas confront our society and our planet. Unprecedented levels of consumption co-exist with extreme poverty. Through new technology we are more connected than we have ever been, yet civic engagement is declining. Environmental neglect continues despite heightened ecological awareness. A better balance is urgently needed.

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Level 5, 131 City Walk  
Canberra, ACT 2601  
Tel: (02) 61300530  
Email: [mail@tai.org.au](mailto:mail@tai.org.au)  
Website: [www.tai.org.au](http://www.tai.org.au)

# Introduction

The Australia Institute welcomes the opportunity to make this submission to the Senate Inquiry on Corporate Tax Avoidance. The issue of tax avoidance by multinational companies has been a research focus of the Institute for some time. While issues of declining PRRT payments and low company tax payments are becoming widely known, particularly due to this committee's work, another important part of public discussion is the claims by corporations that they are actually large tax payers.

Often these claims are based on reports the companies or their lobby groups commission from economic consultants. These reports use various methods to calculate future tax payments by companies, or future tax revenues that governments could receive from wider economic activity based on clients' projects. Invariably, the consultants' work is presented as being certain, precise and scientifically derived by the use of economic models.

However, the future is not certain, economic models are unscientific and often "precisely wrong rather than vaguely right". They depend on a huge number of assumptions that are inherently subjective. These assumptions are routinely not disclosed in the modelling reports, let alone the company media statements that follow. In some cases, the modelling reports themselves are not made public, meaning no scrutiny can be given to these claims. Furthermore, the claims in commissioned reports are rarely compared to real world data on recent tax payments by the companies to ascertain whether the models are producing realistic results.

These reports often receive media coverage with little scrutiny and weaken the public's understanding of tax issues. In this submission we outline some of these reports, their key results and their key flaws.

A driver of this problem is the lack of professional standards in the economics consulting industry. The Australia Institute has long advocated for a code of conduct for economic modellers that would assist with transparency and reporting of commissioned economic modelling. We would be happy to expand on this submission further, either in writing or before a hearing of the committee.



# Economic models, tax, oil and gas

Table 1 below summarises reports commissioned by the oil and gas industry that have been used in public debate, official submissions and media articles, that give the impression oil and gas companies are large tax payers.

**Table 1: Oil and gas industry commissioned economic reports**

Company/project	Consultants	Full report available?	Key tax claims	Comments on actual federal tax paid
<b>Offshore Projects</b>				
<b>Chevron - Gorgon/Wheatstone</b>	ACIL Allen 2015	No	\$338 billion in federal taxes to be paid from 2009 to 2040 <sup>1</sup>	Chevron paid no corporate tax in 2013/14, 2014/15 and 2015/16 despite reporting revenue totalling \$9.2 billion for those three years
<b>Inpex - Ichthys</b>	ACIL Allen	No	\$73 billion in total taxes to be paid from 2012 to 2050 <sup>2</sup>	Inpex reported revenue totalling \$4.6 billion for 2013/14, 2014/15 and 2015/16 and paid only \$0.1 billion in corporate tax for those three years
<b>Shell - Prelude</b>	Internal	No	\$12 billion in taxes will be paid <sup>3</sup>	Prelude will start production in 2018. Shell reported revenue totalling \$47.5 billion for 2013/14, 2014/15 and 2015/16 and paid only \$1.1 billion in corporate tax for those three years.
<b>Onshore Projects</b>				
<b>Santos - Narrabri</b>	ACIL Allen (2016)	Yes	\$1.4 billion in company taxes to be paid 2017 to 2042 (\$3.1b in total taxes to be paid) <sup>4</sup>	Santos paid no corporate tax in 2014/15 and 2015/16 and only \$3 million in corporate tax in 2013/14. Over those three years it reported revenue totalling \$11.2 billion.

<sup>1</sup> ACIL Allen (n.d.) *A Snapshot Of Chevron's Realised And Forecast Economic Benefits In Australia* [http://www.acilallen.com.au/cms\\_files/ACILAllen\\_Chrevon2015.pdf](http://www.acilallen.com.au/cms_files/ACILAllen_Chrevon2015.pdf)

<sup>2</sup> ACIL Allen (n.d.) *An Economic Impact Assessment: The Ichthys LNG Project* [:http://www.inpex.com.au/media/2967/2240\\_acil-allen-brochure-2\\_web.pdf](http://www.inpex.com.au/media/2967/2240_acil-allen-brochure-2_web.pdf)

<sup>3</sup> Validaris (2013) *Prelude project will inject \$45bn to Australian economy: Shell* <https://www.australianmining.com.au/news/prelude-project-will-inject-45bn-to-australian-economy-shell/>

<sup>4</sup> ACIL Allen (2016) *Narrabri Gas Project – Economic Impact Report*, p30

<b>Coal seam gas development in Qld</b>	ACIL Tasman (2012)	Yes	\$228 billion in federal taxes to be paid from 2011 to 2035 <sup>5</sup>	Qld coal seam gasfields have produced less gas than forecast and the three Gladstone LNG have had larger writedowns indicating tax paid will be much less than forecast.
<b>Arrow LPNG plant</b>	AEC Group (2011)	Yes	\$13.1 billion in federal taxes to be paid from 2013/14 to 2029/30 <sup>6</sup>	Arrow's parent company, Shell reported revenue totalling \$47.5 billion for 2013/14, 2014/15 and 2015/16 and paid only \$1.1 billion in corporate tax for those three years.
<b>APPEA – Economic impact of shale and tight gas development in the NT</b>	Deloitte Access Economics (2015)	Yes	\$961 million increase in NT Government revenue over the period 2020-2040 <sup>7</sup>	Later report for NT Fracking Inquiry by ACIL Allen found “very high” probability of “failure to commercialise”. <sup>8</sup>

Sources: see footnotes and ATO (2017) *Corporate Tax Transparency*, <https://data.gov.au/dataset/corporate-transparency>

Table 1 is not an exhaustive list of such reports. Many other examples exist from the oil and gas industry and project proponents from other industries and interest groups.

A key point from Table 1 is that claims of hundreds of billions in tax revenues are based on modelling reports that are not available to the public. In the case of Inpex, our repeated requests to the company and the consultants for a copy of the report were acknowledged, but the report was never provided.<sup>9</sup>

It is important to realise that the ‘key tax claims’ in Table 1 do not estimate the tax that would be paid by the companies that commissioned the reports.<sup>10</sup> Instead, they are modelled estimates of how much extra tax all industries in the economy might pay as a result of indirect economic activity due to the proponent’s project. These estimates are still less transparent and reliant on still more assumptions than simple estimates of

<sup>5</sup> ACIL Tasman (2012) *Economic significance of Coal Seam Gas in Queensland*, p101 [http://www.acilallen.com.au/cms\\_files/ACIL\\_CSG\\_Queensland\\_2012.pdf](http://www.acilallen.com.au/cms_files/ACIL_CSG_Queensland_2012.pdf)

<sup>6</sup> AEC Group (2011) *Economic Impact Assessment: Arrow LNG Plant*, p56.

<sup>7</sup> Deloitte (2015) *Economic impact of shale and tight gas development in NT*, [https://www.appea.com.au/wp-content/uploads/2015/08/APPEA\\_Deloitte-NT\\_Unconv\\_gas\\_FINAL-140715.pdf](https://www.appea.com.au/wp-content/uploads/2015/08/APPEA_Deloitte-NT_Unconv_gas_FINAL-140715.pdf)

<sup>8</sup> ACIL Allen (2017) *The economic impacts of a potential shale gas development in the Northern Territory*, <https://frackinginquiry.nt.gov.au/inquiry-reports?a=465934>

<sup>9</sup> Personal correspondence between Australia Institute, ACIL and Inpex in July 2017. Available on request.

<sup>10</sup> The exception appears to be the Shell Prelude study. While the Chevron and Inpex studies are not available, their summary documents suggest this is the case when read carefully.

future tax liabilities. This is a key reason why there is a large difference between tax claims in commissioned reports and the actual taxes paid by oil and gas companies.

Some estimates in these reports do refer to tax payments by the commissioning company. For example, Chevron's 2015 ACIL report estimates the company would pay around \$300 million in federal taxes in 2016, 2017 and 2018. Clearly, these forecasts have not been met, with Chevron paying no federal tax in recent years.

While it may be expected that tax revenues will increase later in the project period due to the design of Australian company tax and Petroleum Resource Rent Tax (PRRT), no updates are issued to the media or authorities to inform discussion. Ongoing reports that kept the public abreast of changes to forecast tax revenues would be useful, but have never been written in our experience. Australia's slow progress on implementing the Extractive Industry Transparency Initiative further erodes trust in this discussion.

Furthermore, the inherent assumption in these reports is that the methods used to reduce tax paid by companies at present will not be used in the future. Companies that are currently not paying PRRT or company tax due to legitimate deductions and various avoidance mechanisms, are likely to continue using such methods to significantly reduce tax payments. The economic modelling reports invariably assume this will not be the case, but without clearly stating this assumption.

## Literature on major project economic assessment

Economic models, including those used in reports listed above, almost invariably over-estimate the future benefits of a project because of two motivations. Firstly as Nobel Prize Winner, Daniel Kahneman, and Amos Tversky highlighted, humans have an over-optimism bias. People involved in a project have a poor ability to foresee what could go wrong and base their forecasts of the future on the best case rather than the likely case – this is referred to as the planning fallacy.<sup>11</sup>

The second motivation is less innocent. Project proponents exaggerate the benefits (including tax revenues) and understate the costs of a project because there are incentives for them to do so. Bent Flyvbjerg, the world's leading expert on megaprojects has written extensively on this 'strategic misrepresentation'.<sup>12</sup>

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<sup>11</sup> Kahneman, D. & Tversky, A. (1979a) *Prospect theory: An analysis of decisions under risk*, *Econometrica*, 47, pp. 313–327. Kahneman, D. & Tversky, A. (1979b) *Intuitive prediction: Biases and corrective procedures*, in: S. Makridakis & S. C. Wheelwright (Eds) *Studies in the Management Sciences: Forecasting*, vol. 12 (Amsterdam: North Holland).

<sup>12</sup> Flyvbjerg (2008) *Curbing Optimism Bias and Strategic Misrepresentation in Planning: Reference Class Forecasting in Practice*, *European Planning Studies* 16:3-21, p9

Because the reports focus on the future and what the future will bring is unclear there is a chance that the scenarios they paint will come true but it is a slim chance as we detail below, there are often clear problems with the assumptions the models use and the modelling methods employed.

## Modelling assumptions - garbage in, garbage out

The economic modelling reports often highlight a single figure number such as the \$330 billion in tax Chevron claims its Gorgon and Wheatstone projects. This gives an air of certainty and precision that is almost always totally unwarranted. Oil and gas prices are notoriously volatile. For instance the world oil price fell from over \$90USD barrel in July 2014 to \$55USD a barrel a year later. The tendency to optimism highlighted by Kahneman and Tversky leads to an over-estimation of oil and gas revenues and taxes and an underestimation of the costs required to extract them.

Combine notoriously volatile oil and gas prices with an over-estimation of oil and gas reserves and an under-estimation of costs and then add the incentive for strategic misrepresentation on top of that and the forecast benefits (including tax benefits) of projects are often out not by a few per cent but by several factors. As Flyvbjerg writes:

When cost and demand forecasts are combined, for instance in the cost-benefit analyses that are typically used to justify large infrastructure investments, the consequence is inaccuracy to the second degree. ***Benefit-cost ratios are often wrong, not only by a few percent but by several factors.*** As a consequence, estimates of viability are often misleading, as are socio-economic and environmental appraisals, the accuracy of which are heavily dependent on demand and cost forecasts. These results point to a significant problem in policy and planning: ***More often than not the information that promoters and planners use to decide whether to invest in new projects is highly inaccurate and biased making plans and projects very risky.***<sup>13</sup>

Research highlighting over-optimism in project modelling in the oil and gas industry includes work by:

- Westney, a Houston-based engineering and risk consultant to the oil and gas industry. Whitney estimated that the probability of oil and gas projects running on time and on cost is only between 5% and 25%.<sup>14</sup> Westney also quote

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<sup>13</sup> Flyvbjerg (2008) *Curbing Optimism Bias and Strategic Misrepresentation in Planning...*, p5, emphasis added.

<sup>14</sup> Briel, Luan and Westney (2014) *Built-in Bias Jeopardises Project Success*, p2, <http://www.westney.com/wp-content/uploads/2014/04/Built-in-Bias-article-SPE-as-published.pdf>

Independent Project Analysis who found only 22% of large oil and gas projects were on time and on budget.<sup>15</sup> Both these estimations leave aside the question of whether the projects also achieved their stated benefits (i.e. revenue including tax revenue). To help answer this question Westney quote a PricewaterhouseCoopers study that found only 2.5% of megaprojects met their objectives of scope, cost, schedule *and* benefits.<sup>16</sup>

- Consulting firm EY analysed 365 oil and gas megaprojects and found 65% were over-budget and 73% over time. The budget overruns were not small – current project estimated costs were, on average, 59% above the initial estimate. EY noted these estimates were likely to understate poor performance as a substantial amount of the projects were still underway. Once again, EY only looked at cost performance and did not cover revenue performance.<sup>17</sup>

Most of the studies discussed in these reviews are aimed at investors, who arguably have greater interest in and ability to demand transparency around companies' analysis. Economic modelling studies released for public relations purposes are likely to be more optimistic still and should be treated with scepticism.

## Conclusion

While this inquiry's key focus is on the adequacy of Australia's tax laws, debate around multinational companies and tax payments is also playing out in state planning systems and the court of public opinion. Commissioned economic assessments often play a role in this wider context.

These economic assessments are unreliable and non-transparent. A key problem is the lack of professional standards in the economics profession. Unlike actuaries, accountants and any number of other professions, there are no professional bodies that enforce standards on economists. The Australia Institute has long argued for a code of conduct for economic modellers.<sup>18</sup>

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<sup>15</sup> Boschee (2012) *Panel Session Looks at Lessons Learned from Megaprojects*. SPE Today, 10 October 2012. Quoted in Briel, Luan and Westney (2012).

<sup>16</sup> PricewaterhouseCoopers (PwC) (2009) *Need to know: Delivering capital project value in the downturn*. Quoted in Briel, Luan and Westney (2012). Note this study refers to all megaprojects, not just oil and gas megaprojects.

<sup>17</sup> EY (n.d.) *Spotlight on oil and gas projects*, p4-5, [http://www.ey.com/Publication/vwLUAssets/EY-spotlight-on-oil-and-gas-megaprojects/\\$FILE/EY-spotlight-on-oil-and-gas-megaprojects.pdf](http://www.ey.com/Publication/vwLUAssets/EY-spotlight-on-oil-and-gas-megaprojects/$FILE/EY-spotlight-on-oil-and-gas-megaprojects.pdf)

<sup>18</sup> Denniss (2016) A code of conduct for economic modelling: Ensuring transparency, quality and consistency, <http://www.tai.org.au/sites/default/files/Brief%20-%20Code%20of%20Conduct%20for%20Economic%20Modelling.pdf>

# Volatile gas

## Economics and gas in Western Australia

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*Already exposed to resource price volatility, WA will now allow fracking for unconventional gas. Despite recent increases in gas production, domestic prices are forecast to increase and gas still accounts for just 2% of state revenues and at best 1% of employment.*

Report supported by Lock the Gate

Cameron K. Murray

Rod Campbell

December 2018

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Level 1, Endeavour House, 1 Franklin St  
Canberra, ACT 2601

Tel: (02) 61300530

Email: [mail@tai.org.au](mailto:mail@tai.org.au)

Website: [www.tai.org.au](http://www.tai.org.au)

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# Summary

Western Australia's economy is heavily impacted by the resource sector. 22% of gross state production comes from resources, making it heavily exposed to the booms and busts of global resource markets.

The established gas industry in Western Australia comprises large-scale offshore gas fields focussed on export markets and a number of smaller onshore gas producers supplying domestic users.

Resource royalties and taxes for petroleum (oil and gas) generated \$576 million in revenue, or about 2% of total revenues, for the Western Australian government in 2016-17.

The domestic gas reservation policy (DGR policy) ensures that major gas exporters supply 15% of the gas they produce to the domestic market, currently around 4 TJ per day, with new reserve gas coming to the domestic market this year.

The DGR policy has insulated local gas users from global prices. Prices have fallen in recent years, with Western Australia's domestic gas now 31% cheaper than Australia's East Coast where no such policy exists. However, Australia's Energy Market Operator forecasts increasing prices and new supply. If new supply is high-cost unconventional gas it may set prices and see substantial price increases.

Major domestic gas users in Western Australia are grid-connected electricity generation (25%), mining (24%), mineral processing (28%—predominantly alumina), and industrial use (18%). Other businesses use just 4% and households just 2%.

The petroleum (oil and gas) industry is one of the smallest employers in Western Australia's resources sector with all gas related industries employing just over 11,400 people in 2016, just 1 percent of the state's employment.

Compared to the established offshore gas industry, onshore unconventional gas (in coal seams or shale formations) will be high cost. This means that royalties which apply to value-added prices will bring less revenue than existing low-cost offshore gas.

Most resource rich regions are diversifying their economies rather than investing in new high cost projects in established energy sectors. Including more gas in the economic mix simply ties Western Australia's economic fortunes more closely to global commodity cycles.

# Introduction

Western Australia is a resource rich region with an outsized mining and resource sector comprising 22% of state production on average over the past decade.<sup>1</sup> This is far higher than Queensland, which generates 9% of gross state product from mining. Australia as a whole has only 7% of Gross Domestic Product (GDP) from natural resources, and even resource-rich Norway, for example, generates just 9% of GDP from their resources sector.<sup>2</sup>

Recent exploration activity has shown that unconventional onshore gas, in coal seams and shale formations, is likely to be widespread in Western Australia, particularly in the Perth and Canning Basins.

In September 2017 a state-wide moratorium on hydraulic fracture stimulation (fracking) for onshore unconventional gas was imposed and a scientific inquiry into fracking was established.<sup>3</sup> Concerns about risks to the environment, health, agriculture and heritage motivated this policy. Because of this, no projects tapping these unconventional gas reserves exist, but many are likely to be proposed if the policy is changed and if global gas prices increase in coming years. The results of this inquiry led to the state's moratorium on fracking being lifted in November 2018.<sup>4</sup>

Because extracting depletable natural resources is a one-shot exercise, questions about the economic value that the community can derive from them are crucial. This report provides background on the WA gas industry, to assist stakeholders in understanding the impacts of future development of unconventional in WA.

In the Western Australian context, questions about the economic value of resource development must also consider the macroeconomic implications of further

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<sup>1</sup> ABS. (2017). *5220.0 - Australian National Accounts: State Accounts, 2016-17*. Australian Bureau of Statistics. Table 6. <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/5220.02016-17?OpenDocument>

<sup>2</sup> World Bank. (2018). *Total natural resource rents (% of GDP)*. World Bank Open Data. <https://data.worldbank.org/indicator/NY.GDP.TOTL.RT.ZS?locations=EC-AU-NOT>  
World Bank staff estimates based on sources and methods described in "The Changing Wealth of Nations 2018: Building a Sustainable Future".

<sup>3</sup> Government of Western Australia. (2017). *Independent Scientific Panel Inquiry into Hydraulic Fracture Stimulation in Western Australia 2017*. <https://frackinginquiry.wa.gov.au>

<sup>4</sup> Newell (2018) Mark McGowan lifts moratorium on WA fracking, <https://thewest.com.au/business/energy/mark-mcgowan-lifts-moratorium-on-wa-fracking-ng-b881033600z>

concentrating the productive base in the resource and energy sectors. Because of the risks and economic fluctuations that come from high resource dependency in an economy, the World Bank has recently been helping many resource-rich nations to foster more diversity in their economic capacity.<sup>5</sup>

WA Treasury is aware of the risks and volatility that an outsized resource sector presents to its wider economy and community. In a recent submission to the Productivity Commission, Treasury wrote:

States with large mining activities may need to use the rents [of the mining sector] to offset the risks for the community associated with regional and State-wide economic volatility that is consequent upon the dependence on mining, including the finiteness of resources.<sup>6</sup>

If Western Australia was a country, World Bank advice would be to diversify rather than double-down on resources. Despite acknowledging the same problems, Australian Treasuries seem reluctant to give the same advice.

## LOCATION

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The domestic gas industry in WA began in the early 1970s with the establishment of the Dongara production facility, approximately 320kms north of Perth, and the Parmelia pipeline to Perth (location shown in Figure 1).<sup>7</sup> Since that time, additional gas projects in the Perth Basin were developed to supply gas for commercial, industrial and residential users in the south-west, such as Xyris and Red Gully. In recent years many of these established projects have reached the end of their life, while further discoveries have seen some new reserves begin development in the region.<sup>8</sup>

In terms of total production capacity, Western Australia's gas industry is now dominated by offshore export-focussed facilities in the North West Shelf (NWS) located off the coast near Karratha in the state's north-west (see Figure 1, Inset A). As well as producing liquified natural gas (LNG) shipped to export markets, these gas

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<sup>5</sup> Fruman, C. (2017). *Economic diversification: A priority for action, now more than ever*. World Bank. Private Sector Development Blog. <http://blogs.worldbank.org/psd/economic-diversification-priority-action-now-more-ever>

<sup>6</sup> Government of Western Australia. (2017) *Western Australia's Submission to the Productivity Commission's Inquiry into Horizontal Fiscal Equalisation*. P41. [http://www.pc.gov.au/\\_\\_data/assets/pdf\\_file/0008/218564/sub015-horizontal-fiscal-equalisation.pdf](http://www.pc.gov.au/__data/assets/pdf_file/0008/218564/sub015-horizontal-fiscal-equalisation.pdf)

<sup>7</sup> Mitsui. (2018). *History of oil and gas in the Perth Basin*. Mitsui E&P. <https://mitsuiepmidwest.com.au/who-we-are/history-oil-gas-perth-basin/>

<sup>8</sup> Diss, K. (2016). *AWE approves Perth basin gas field development*. ABC News. 5 Jan 2016. <http://www.abc.net.au/news/2016-01-05/awe-approves-perth-basin-gas-field/7068546>

facilities provide domestic gas due to legislated requirements for gas exporters to also supply domestic gas markets, known as the domestic gas reservation (DGR) policy.<sup>9</sup>

The offshore gas industry began in the 1980s with the development of the North West Shelf joint venture project.<sup>10</sup> Domestic gas from this project was secured by long-term contracts with the State Energy Commission of Western Australia (SECWA), the government entity responsible for gas and electricity supply. The cost to WA taxpayers of this assistance to the gas industry was substantial, as WA Treasury has noted:

In 2010 net present value terms, the cost of Western Australia's assistance to the North West Shelf project (e.g. payment of subsidies to the State's power utility to help cover the losses it initially incurred under crucial 'take or pay' gas contracts) is estimated to be around \$8 billion.<sup>11</sup>

Gas from the NWS is transported to domestic users in and around Perth through the Dampier-Bunbury pipeline, which was funded by SECWA and first operated in 1985. In addition, gas from the NWS is transmitted to inland mineral miners for local power generation through the Goldfields Gas Pipeline that was opened in 1996. This 1,378km pipeline connects NWS gas production and nearby production from Varanus Island (which supplies domestic gas exclusively)<sup>12</sup> to the Kalgoorlie to Kambalda Pipeline. Along the way it delivers gas for electricity generation at a number of mines, such as the Mount Keith Nickel Mine and BHP's Pilbara iron ore mines that use electricity from the Newman Power Station.<sup>13</sup>

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<sup>9</sup> Domgas Alliance. (2013). *WA Domestic Gas Market Outlook: 2013 – 2020*. February 2013. [http://www.domgas.com.au/pdf/Alliance\\_reports/WA%20DOMESTIC%20GAS%20MARKET%20OUTLOOK-FINAL-Feb%202013.pdf](http://www.domgas.com.au/pdf/Alliance_reports/WA%20DOMESTIC%20GAS%20MARKET%20OUTLOOK-FINAL-Feb%202013.pdf)

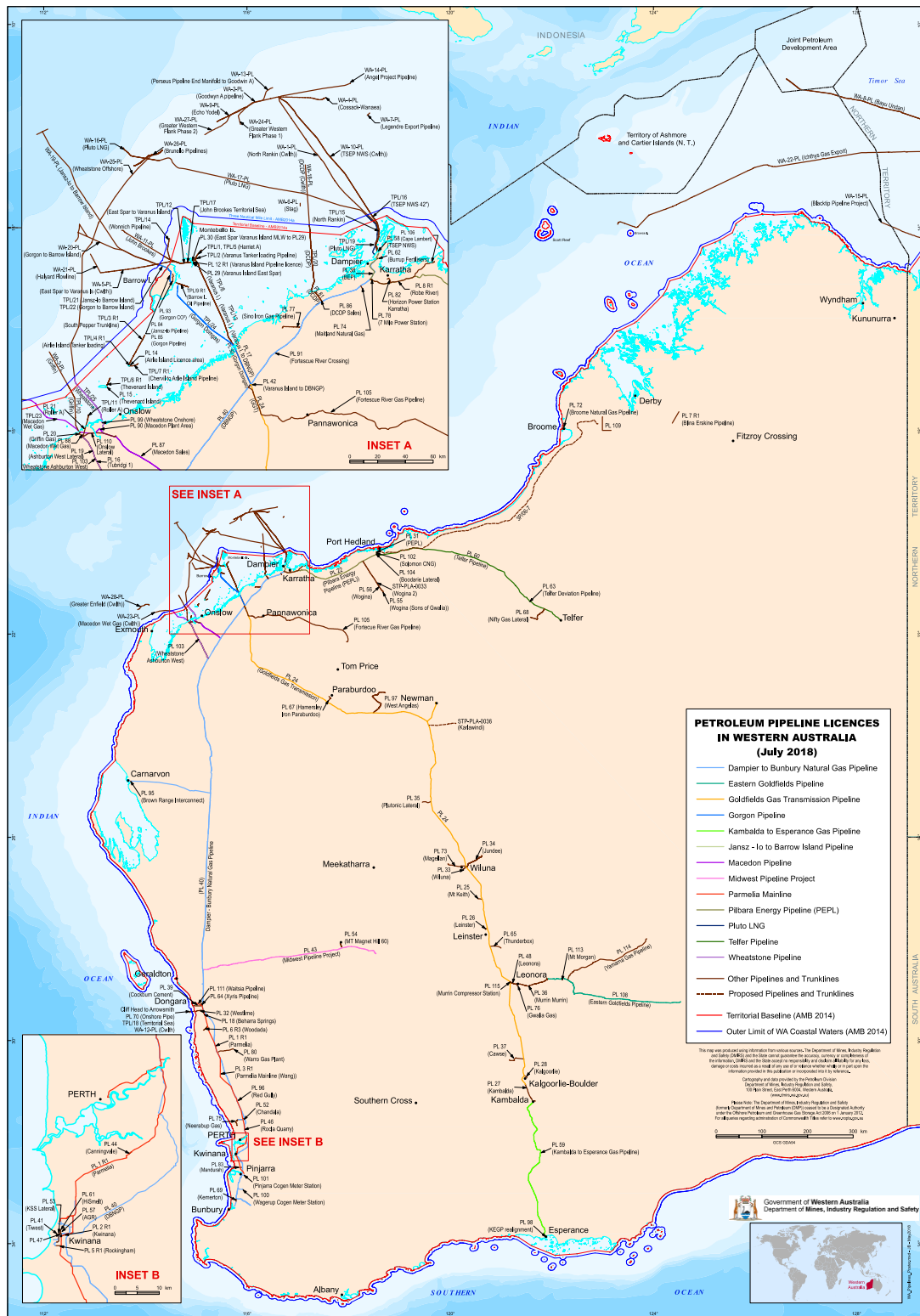
<sup>10</sup> The Western Australian government underwrote the project and constructed the Dampier-Bunbury pipeline. Joint venture partners are: Woodside Energy Pty Ltd (the NWS project operator); BP Development Australia Pty Ltd; BHP Billiton Petroleum (North West Shelf) Pty Ltd; Chevron Australia Pty Ltd; CNOOC NWS Private Limited; Japan Australia LNG (MIMI) Pty Ltd; and Shell Development (Australia) Pty Ltd.

<sup>11</sup> WA Treasury. (2011) *GST Distribution Review: WA Submission*. P13. [https://www.treasury.wa.gov.au/uploadedFiles/\\_Treasury/Publications/wa\\_submission\\_gst\\_distribution\\_review\\_october2011.pdf](https://www.treasury.wa.gov.au/uploadedFiles/_Treasury/Publications/wa_submission_gst_distribution_review_october2011.pdf)

<sup>12</sup> Quadrant Energy. (2017). *Varanus Island Facilities Factsheet*. <https://www.quadrantenergy.com.au/wp-content/uploads/2016/12/Varanus-Island-Facilities-Factsheet-January-2017.pdf>

<sup>13</sup> APA. (2018). *Goldfields gas pipeline system*. <https://www.apa.com.au/globalassets/documents/info/schematic/ggp-schematic.pdf>

**Figure 1: Map of Western Australia gas projects and pipelines**



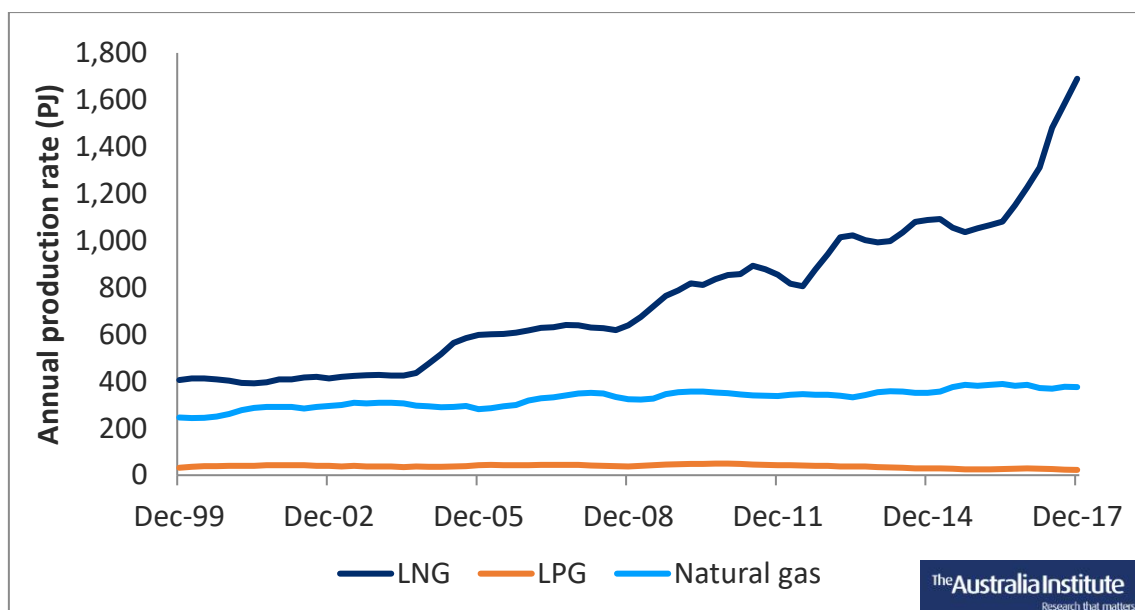
Source: DMIRS. (2017a). *Petroleum pipelines licences in Western Australia*. Department of Mines, Industry, Regulation and Safety.

<http://www.dmp.wa.gov.au/Documents/Petroleum/PD-SBD-GEO-103D.pdf>

## PRODUCTION

Presently, gas production in Western Australia is characterised by high volumes of liquified natural gas (LNG) exports, and lower volumes of natural gas piped to WA consumers without liquefaction. There are also smaller quantities of liquified petroleum gas (LPG), consisting of butane or propane, as opposed to the methane of LNG, which is used domestically for such purposes as gas bottles and cars. The production of these gas products is shown in Figure 2 below:

**Figure 2: WA gas production**



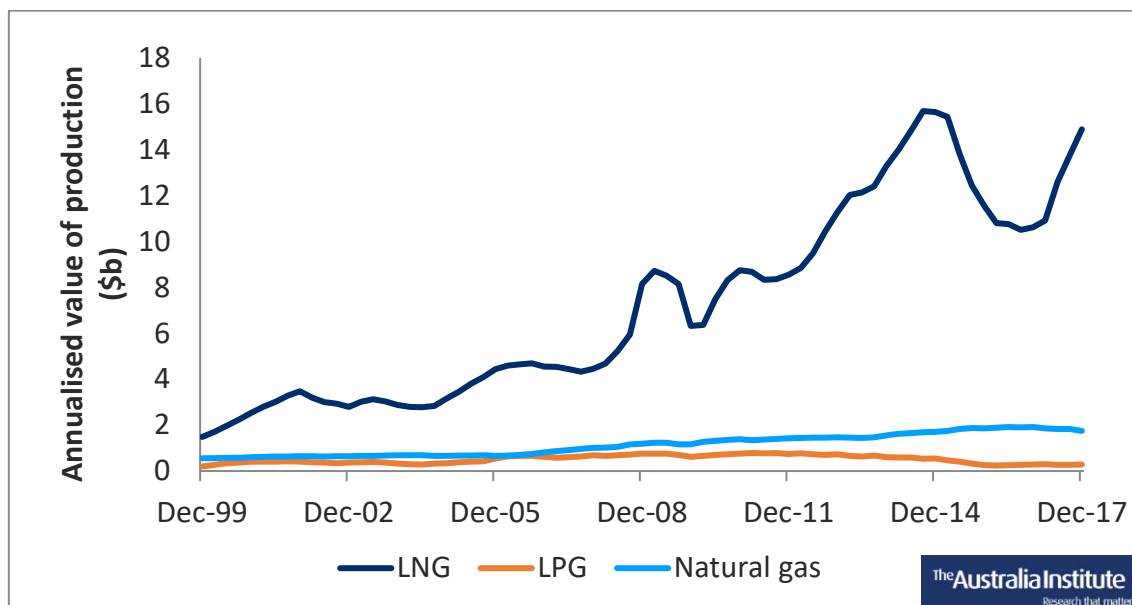
Source: DMIRS. (2017b). *Mineral and Petroleum Statistics Digest 2016-17*.

[http://dmp.wa.gov.au/Documents/About-Us-Careers/AboutUs-StatisticsDigest\\_2016-17.pdf](http://dmp.wa.gov.au/Documents/About-Us-Careers/AboutUs-StatisticsDigest_2016-17.pdf)

Figure 2 shows that the vast majority of WA gas production is exported as LNG, a trend that will continue as large projects continue to ramp up capacity.

Total LNG production reached a record high in 2017 of 28.7 million tonnes, or around 1,700 PJ, however the value of this production was not a record, as global prices have fallen from the recent peaks (see Figure 3). Notably, the value of production of this LNG production has been extremely volatile during the past decade, increasing by 150% from 2008 to 2015, before decreasing 35% from 2014 to 2016, before increasing 40% since. As LNG is over 90% of the gas industry, further gas development is likely to tie the industry even closer to the global resource cycle that creates the volatile conditions in the overall Western Australian economy. This volatility can be seen in the value of WA gas production, particularly LNG, shown in Figure 3 below:

Figure 3: Value of WA gas production



Source: DMIRS. (2017b). *Mineral and Petroleum Statistics Digest 2016-17*.

## EXPORTS

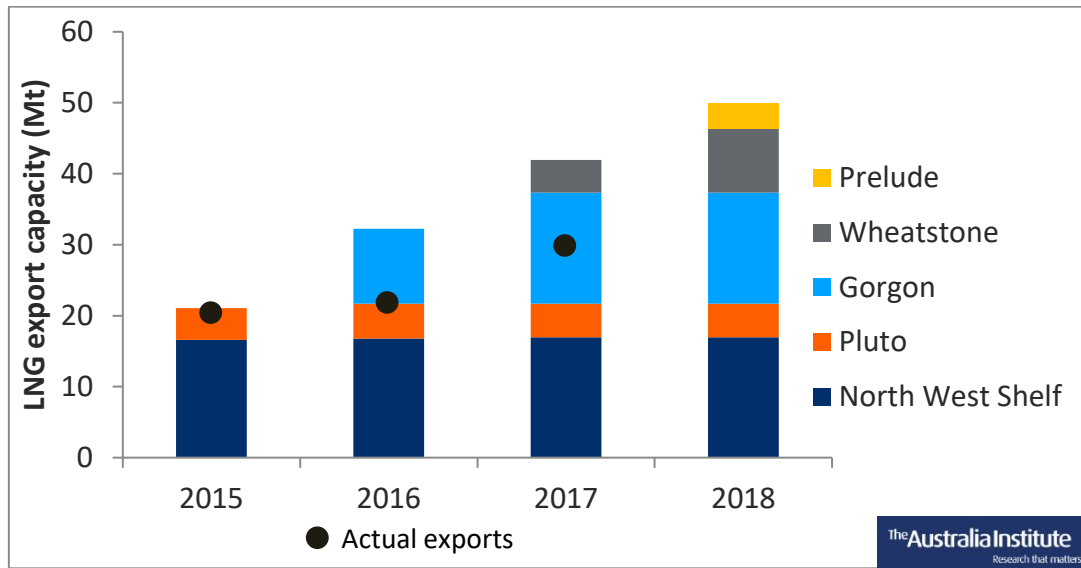
LNG is by far the leading gas product and gas export of WA, which comes predominantly from offshore gas wells which are compressed into liquid form for tanker shipment to export markets.

Western Australia currently has four operating LNG export projects: the North West Shelf, Pluto, Gorgon and Wheatstone. By the end of 2018, the State will have five operating LNG export projects with a total capacity of close to 50 million tonnes a year.<sup>14</sup>

The past four years have seen increased investment in export capacity from Gorgon and Wheatstone projects, as well as the recent arrival of the Shell's Prelude floating LNG facility (see Figure 4). Actual exports were close to the export capacity in 2015, but since then the softening of global gas prices coupled with the enormous increase in capacity has meant there presently appears to be excess export capacity. To recover the recent investment costs from export terminal investments, the incentive is for gas producers to increase supply of gas to export markets even in the face of low or declining prices (as long as the price exceeds their marginal cost).

<sup>14</sup> JTSI. (2018). *WA Liquefied Natural Gas Industry Profile*. July 2018. Department of Jobs, Tourism, Science and Innovation. [http://www.jtsi.wa.gov.au/docs/default-source/default-document-library/wa-lng-profile---july-2018.pdf?sfvrsn=ec93721c\\_2](http://www.jtsi.wa.gov.au/docs/default-source/default-document-library/wa-lng-profile---july-2018.pdf?sfvrsn=ec93721c_2)

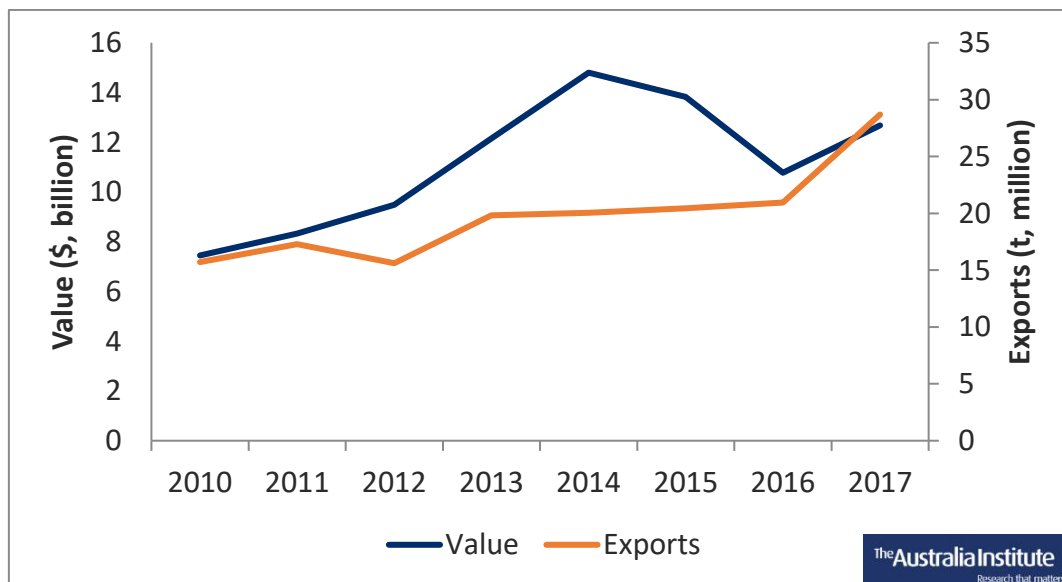
**Figure 4: Western Australia LNG export capacity**



Source: JTSI. (2018). *WA Liquefied Natural Gas Industry Profile*.

As shown in Figure 5, the total value of Western Australia's LNG exports peaked in 2014 at around \$15 billion due to the temporary LNG price boom which saw global prices reach a peak of around USD 20 per million British Thermal Units (mmbtu) in Asian markets. Current prices in these markets are around USD 11.<sup>15</sup> This period of high prices led to financial commitments towards new investment in export capacity which have since begun operating and have led to record high exports volumes.

**Figure 5: Western Australia LNG exports**



Source: DMIRS. (2017b).

<sup>15</sup> Bluegold Research. (2018). *Global LNG Prices*. <https://bluegoldresearch.com/global-lng-prices>



## DOMESTIC CONSUMPTION

Domestic gas in Western Australia is used for grid-connected electricity generation (25%), mining (24%), mineral processing (28%—predominantly alumina), industrial use (18%—ammonia, oil and gas processing, brickworks, cement manufacturers, and chemicals plants). Business users make up 4% of gas use.<sup>16</sup>

Residential users are about 2% of gas use, however they do contribute to peak demand in winter for home heating. This breakdown of domestic gas use has been relatively constant in recent years, as Table 1 shows. However, gas used in mining operations has grown 41% in the past four years, while gas used in electricity generation has fallen by 5%.

**Table 1: Domestic gas use by industry (TJ/day)**

Uses	2013	2014	2015	2016	2017
LNG	9	8	19	14	8
Mining	180	179	196	234	253
Industry	161	153	154	156	165
Grid-connected power generation	275	281	283	264	260
Mineral Processing	300	291	292	291	294
Other	60	61	61	63	63
<b>Total</b>	<b>985</b>	<b>973</b>	<b>1005</b>	<b>1020</b>	<b>1043</b>

Source: Marsden Jacob Associates. (2017).

Note: Data for 2017 calendar year extrapolated from 1 Jan to 28 Aug AEMO data. Excludes gas used in gas shipping which is estimated to be 20 TJ/day. Definitions: GPG – gas used in grid connected generators primarily used for power supply to residential and commercial customers in townships or cities; LNG – gas used by LNG projects in the construction phase of projects; Mining – includes iron ore, gold, lithium and nickel mines; Industry – includes ammonia, oil and gas processing (e.g. LPG, petroleum), brickworks, cement manufacturers, and chemicals plants; Mineral Processing – includes alumina refineries, nickel smelters and titanium oxide production.

Minerals processing and mining gas use is dominated by a handful of companies. In 2010 just five large companies accounted for 90% of gas use in Western Australia—

<sup>16</sup> Marsden Jacob Associates. (2017). *The development of annual and peak gas demand forecasts for the Western Australian Gas Market*. Prepared for the Australian Energy Market Operator. [https://www.aemo.com.au/-/media/Files/Gas/National\\_Planning\\_and\\_Forecasting/WA\\_GSOO/2017/MJA-Methodology-Report.pdf](https://www.aemo.com.au/-/media/Files/Gas/National_Planning_and_Forecasting/WA_GSOO/2017/MJA-Methodology-Report.pdf)

Alcoa, Alinta Sales, BHP Billiton, Burrup Fertilisers and Verve Energy.<sup>17</sup> These gas users typically enter long-term gas supply contracts lasting a decade or more to insulate themselves from short term price variation.

## DOMESTIC SUPPLY AND GAS RESERVATION

Natural gas supply to the domestic gas market came from nine active projects in 2017, summarised in Table 2. Of this 1,659 TJ per day of total domestic gas capacity, 97% is from gas fields in the Carnarvon Basin in the state's north-west—Devil Creek, Gorgon, Karratha Gas Plant (NWS project), Macedon, and Varanus Island (see Figure 1 Inset A).

The remaining projects—Beharra Springs, Dongara, Red Gully, and Xyris—are in the Perth Basin, and many are nearing the end of their life. Dongara, for example, is being decommissioned.

**Table 2: Domestic gas production facility capacity and average utilisation WA**

Facility	Nameplate capacity (TJ/day)	Peak production (TJ/day)	Average production (TJ/day) Q3,16-Q2,17	Average capacity utilisation FY 2016-17 (%)
Beharra Springs	19.6	16.3	13	66
Dongara	7	2	0.2	2
Devil Creek	220	147	99	45
Gorgon (Phase 1)	182	182	86	47
Karratha Gas Plant	630	605	411	65
Macedon	220	220	206	93
Red Gully	10	9	6	64
Varanus Island	360	274	205	57
Xyris	10	10	8	80
<b>TOTAL</b>	<b>1,659</b>	<b>1,465</b>	<b>1,034</b>	<b>62</b>

Source: AEMO. (2017). *Western Australia Gas Statement of Opportunities 2017*. Australian Energy Market Operator. <https://www.aemo.com.au/Media-Centre/2017-WA-Gas-Statement-of-Opportunities>

To ensure that domestic users benefit from exploitation of gas resources, the long-held policy position of the Western Australian government has been to maintain a domestic gas reservation (DGR) policy.

<sup>17</sup> ACIL Tasman. (2010). *Gas prices in Western Australia*. Review of inputs to the WA Wholesale Energy Market. [https://www.aemo.com.au/media/docs/default-source/rules/other-wem-consultation-docs/2010/acil\\_tasman\\_final\\_report\\_-\\_updated5eee.pdf?sfvrsn=2](https://www.aemo.com.au/media/docs/default-source/rules/other-wem-consultation-docs/2010/acil_tasman_final_report_-_updated5eee.pdf?sfvrsn=2)

Successive WA governments have maintained a domestic gas policy since helping underwrite the North West Shelf LNG project in 1979. The policy was formalised in 2006 and clarified in 2012.<sup>18</sup>

Current DGR policy is for natural gas equivalent to 15% of LNG production from each export project to be made available for domestic consumption. There are four agreements for domestic gas reservation agreements now in place, with two projects to soon begin supply, and two currently supplying gas—Barrow Island (Chevron’s Gorgon project) and North West Shelf (Woodside)—as shown in Table 3.

**Table 3: Summary of current WA gas reservation agreements**

Project (agreement date)	Reserves (TCF)	LNG export capacity (mtpa)	Domgas Obligation (PJ and years)	Indicative Supply (TJ/day)	Domgas supplied (PJ)
<b>Gorgon (Chevron, 2003)</b>	42.8	15.6	2,000 PJ (2016-37)	300	6
<b>Pluto (Woodside, 2006)</b>	3.1	4.7	450 PJ (2017-32)	110	0
<b>Wheatstone (Chevron, 2011)</b>	12	8.9	1,600 PJ (2018-39)	200	0
<b>North West Shelf (Woodside, 2015)</b>	10.2	16.9	660 PJ (2015-34)	90	6

Abbreviations: TCF = trillion cubic feet, mtpa = million tonnes per annum, mt = million tonnes PJ = petajoule & TJ = terajoule.<sup>19</sup>

Note: Pluto and Wheatstone domestic gas obligations are only recently commencing and data on actual supply is not yet available.

Rather than supply domestically, offsets can be proposed by gas exporters, which are considered on a case-by case basis. Offsets can meet reserve obligations

<sup>18</sup> JTSI. (2018b). *WA Domestic Gas Policy*. Department of Jobs, Tourism, Science and Innovation. <http://www.jtsi.wa.gov.au/economic-development/economy/domestic-gas-policy>

<sup>19</sup> Sources: JTSI. (2018c). *Western Australian LNG Project Domestic Gas Agreements*. Department of Jobs, Tourism, Science and Innovation. [http://www.jtsi.wa.gov.au/docs/default-source/default-document-library/western-australian-lng-project-domestic-gas-agreements60eb0fa57ba2628e86e4ff0000981137.pdf?sfvrsn=de496d1c\\_6](http://www.jtsi.wa.gov.au/docs/default-source/default-document-library/western-australian-lng-project-domestic-gas-agreements60eb0fa57ba2628e86e4ff0000981137.pdf?sfvrsn=de496d1c_6) and JTSI. (2017). *Western Australian Domestic Gas Policy. Implementation Update*. Department of Jobs, Tourism, Science and Innovation. [http://www.jtsi.wa.gov.au/docs/default-source/default-document-library/update-on-the-implementation-of-the-domestic-gas-policy-0518.pdf?sfvrsn=8486d1c\\_6](http://www.jtsi.wa.gov.au/docs/default-source/default-document-library/update-on-the-implementation-of-the-domestic-gas-policy-0518.pdf?sfvrsn=8486d1c_6)

by supplying gas or other energy from alternative sources, rather than supplying gas from their LNG projects. Offsets must provide a net addition to the state's domestic energy supply.<sup>20</sup>

It is not clear the degree to which offsets could be supplied by unconventional gas or renewable energy. However, no domestic gas reserves are currently supplied by offsets.<sup>21</sup>

The net economic effect of Western Australia's reservation policy is to put a wedge between domestic prices and global prices, insulating domestic gas users from vagaries of global energy price cycles. This effect can be seen in comparison of east-coast and west-coast domestic gas prices in Figure 6 below.<sup>22</sup>

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<sup>20</sup> JTSI. (2018b).

<sup>21</sup> JTSI. (2018d). *Implementation of Domestic Gas Policy*. Department of Jobs, Tourism, Science and Innovation <http://www.jtsi.wa.gov.au/economic-development/economy/domestic-gas-policy/implementation-of-domestic-gas-policy>

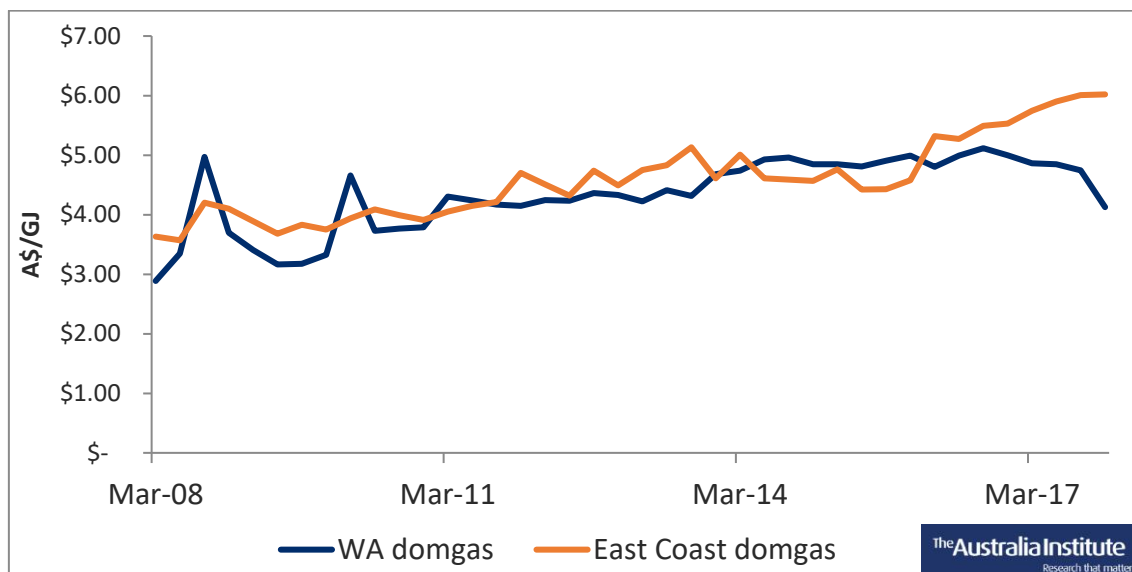
<sup>22</sup> The price spike in 2008 was due to supply disruption from Varanus Island due to the rupture of a corroded pipeline and subsequent explosion. An inquiry report into this event is available from the Parliament of Australia.

[https://www.aph.gov.au/Parliamentary\\_Business/Committees/Senate/Economics/Completed\\_inquiries/2008-10/wa\\_gas\\_08/report/index](https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Economics/Completed_inquiries/2008-10/wa_gas_08/report/index)

The 2010 price spike appears to be due to attempted restriction of domestic gas from producers in a period of high international prices when renegotiating domestic supply contracts.

[http://www.domgas.com.au/pdf/Other\\_reports/DomGas\\_Report\\_2010.pdf](http://www.domgas.com.au/pdf/Other_reports/DomGas_Report_2010.pdf)

**Figure 6: East Coast and WA domestic wholesale gas prices**



Source: DMIRS. (2018a). *Mineral and Petroleum commodity review 2017*. Major Commodities Resources File. <http://www.dmp.wa.gov.au/About-Us-Careers/Latest-Statistics-Release-4081.aspx>

Note: These are average prices paid which mostly come from legacy long-term contracts.

The net economic effect of Western Australia's reservation policy is to put a wedge between domestic prices and global prices, insulating domestic gas users from vagaries of global energy price cycles. This effect can be seen in comparison of east-coast and west-coast domestic gas prices in Figure 6 above.

Figure 6 reflects Queensland's LNG export terminal at Curtis Island near Gladstone commencing operation in 2015, with the east-coast producers becoming connected to global markets. The gas price in east-coast domestic markets increased 36% since the opening of the LNG terminal because it allowed producers to sell to global markets where prices were higher. During this same period, the domestic wholesale price in Western Australia declined by 16%.

Domestic gas users currently benefit from lower energy costs from Western Australia's reservation policy, whereas in Queensland the energy costs for major local gas users have increased substantially. For some types of industrial processing the energy costs are significant. For example, gas accounts for around a third of the cash costs of aluminium production.<sup>23</sup>

<sup>23</sup> JTSI. (2015). *Mineral Royalty Rate Analysis Final Report 2015*. Department of State Development. Department of Mines and Petroleum. [http://www.jtsi.wa.gov.au/docs/default-source/default-document-library/mineral-royalty-rate-analysis-final-report-0315.pdf?sfvrsn=76076e1c\\_6](http://www.jtsi.wa.gov.au/docs/default-source/default-document-library/mineral-royalty-rate-analysis-final-report-0315.pdf?sfvrsn=76076e1c_6)

While WA currently enjoys lower gas prices than the troubled eastern market, similar issues could be coming to the state. Domestic supply is projected to decline to 2023. At that point AEMO forecasts that domestic prices will rise, “encouraging the development of further supply”.<sup>24</sup> However, if much of this supply comes from high-cost unconventional sources prices may not be forced down again. If high-cost fracked gas becomes the marginal supplier to the WA market, similar cost increases to the east coast could occur.

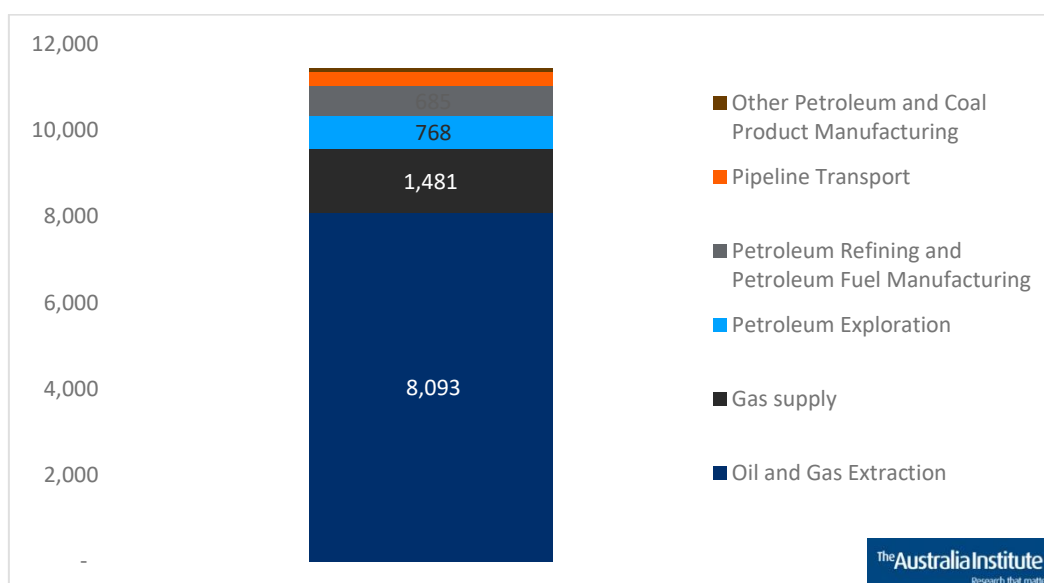
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<sup>24</sup> AEMO (2017) Gas statement of opportunities for Western Australia, [https://www.aemo.com.au/-/media/Files/Gas/National\\_Planning\\_and\\_Forecasting/WA\\_GSOO/2017/2017-WA-GSOO.pdf](https://www.aemo.com.au/-/media/Files/Gas/National_Planning_and_Forecasting/WA_GSOO/2017/2017-WA-GSOO.pdf)

# Employment

Oil and gas industries are capital intensive and employ relatively few people. In WA, around 8,000 people work in oil and gas extraction and 1,481 in gas supply (which includes household gas provision), with another 2,000 working in related industries such as refining (including LNG liquefaction), exploration and pipelines, as shown in Figure 7 below:

**Figure 7: WA employment in oil and gas related industries**

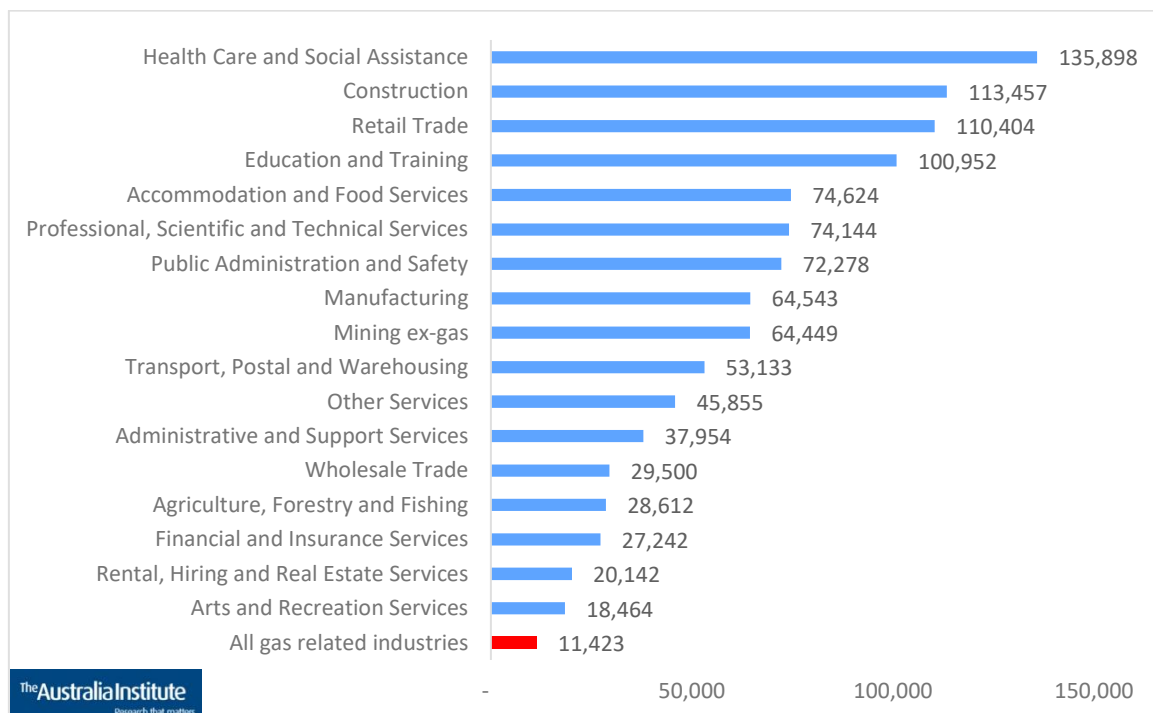


Source: ABS (2016) Census, accessed through TableBuilder

While WA has the most people of any state working in oil and gas industries,<sup>25</sup> the industry represents only one percent of WA's 1.1 million people employed. Even taking a broad definition of the gas industry including household distribution, exploration and unidentified other manufacturing, the industry employs fewer people than arts and recreation, as shown in Figure 8 below:

<sup>25</sup> Using the Census industry categories above the WA total is 11,423. Queensland comes in next with nearly 8,800, followed by Victoria (5,260), NSW (3,407), SA (2,840), NT (863), Tasmania (227 – 130 in supply) and ACT (97 - 58 in supply). Source: ABS (2016) Census.

**Figure 8: WA employment by industry**



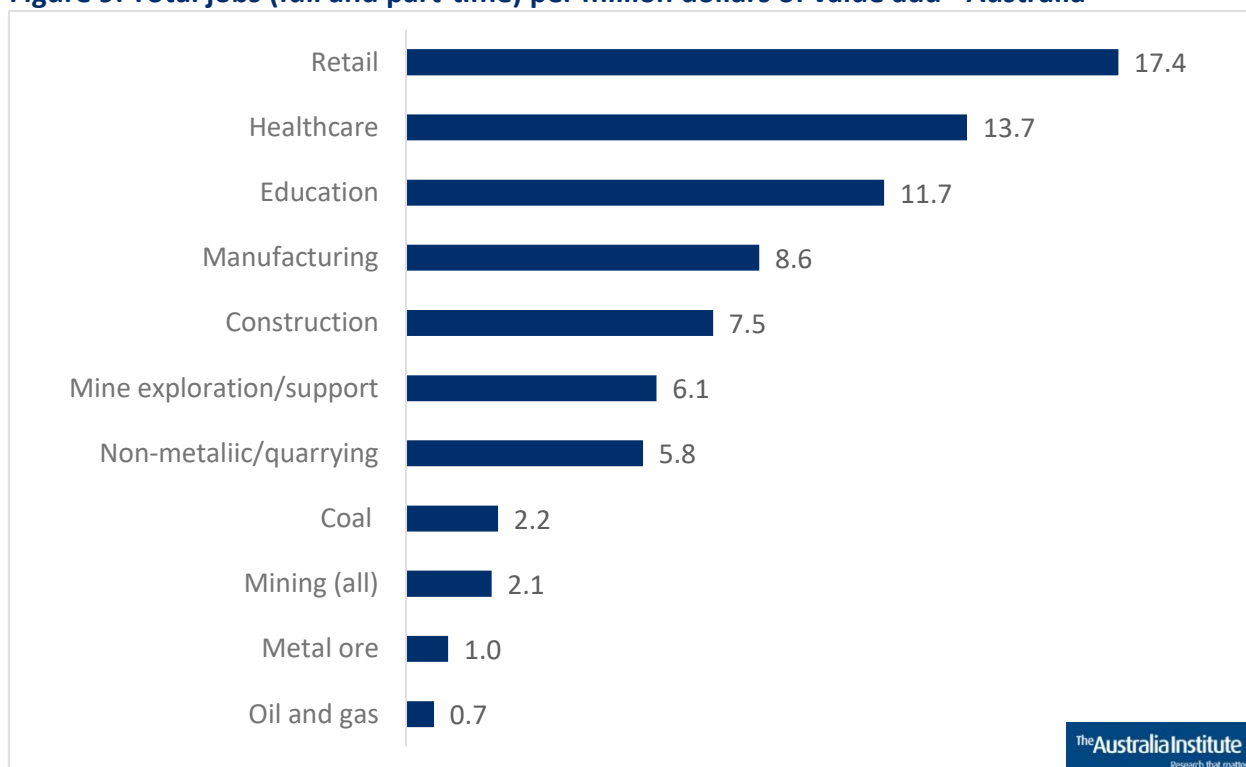
Source: ABS (2016) Census, accessed through TableBuilder

Even compared to other resource industries, the oil and gas industry employs very few people compared the value of the minerals extracted. In 2016 WA's gas industry produced \$12.8 billion worth of gas and petroleum products, while employing at most 11,423 people in all gas-related industries. In other words \$1.1 million dollars worth of gas was sold for every job in the industry.<sup>26</sup> Taking into account the inputs of each industry, oil and gas extraction employs less people per dollar of value added than any other industry, including other parts of the resource sector. If employment growth is the policy goal, then investment in virtually any other industry is will deliver better results. Figure 9 below compares the average number of jobs per million dollars of value added:

<sup>26</sup> Sources: as for Figure 3: Value of WA gas production and Census as for Figure 7: WA employment in oil and gas related industries. 2016 is used as this was the census year. Note that the value of gas production increased by 20 percent in 2017. Assuming constant employment, this would have seen over \$5m of gas produced per job.



**Figure 9: Total jobs (full and part-time) per million dollars of value add - Australia**



Note: 2012-17 average for non resource sectors, 2011-2015 for resource sub-sectors.

Source: ABS (2018) 5204 Australian System of National Accounts, 2017-18 Table 5, <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/5204.02017-18?OpenDocumentABS> (Aug 2018) 6291.0.55.003 - Labour Force, Australia, Detailed, Quarterly, Table 4. <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6291.0.55.003Aug%202018?OpenDocument>; ABS (2016) Mining Operations Australia, [www.abs.gov.au/ausstats/abs@.nsf/mf/8415.0](http://www.abs.gov.au/ausstats/abs@.nsf/mf/8415.0)

As shown in Figure 9, the construction sector creates 7.5 jobs per million dollars of value created (more than 11 times higher than oil and gas), while service sectors like education and healthcare employ between 10 and 20. A diverse economy needs to foster these sectors of the economy as well.

# WA gas royalties and taxes

There are three systems used to collect revenue from petroleum extraction in Western Australia.

1. Wellhead royalties
2. Resource Rent Royalty (RRR)
3. Petroleum Resource Rent Tax (PRRT)

## WELLHEAD ROYALTIES

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Wellhead royalties are *ad valorem* royalties that apply at between 10% and 12% rates to the wellhead value, which is the net value of the gas passing a valuation point in the production line.<sup>27</sup>

Onshore wellhead petroleum royalties are collected by the state government, while the federal government collects wellhead royalties for offshore projects, including the North West Shelf (NWS) – which generates almost all of the gas royalties for the state.

Amendments to the *Offshore Petroleum (Royalty) Act 2006* shifted administrative control for the royalty regime for offshore oil and gas from the Western Australian government to the federal government in 2009. Around 68% of revenues generated are returned to Western Australia in the form of NWS Grants.<sup>28</sup>

Over 99% of oil and gas royalties in Western Australia come from the North West Shelf (NWS) petroleum projects. These projects are subject to both the Petroleum Resource Rent Tax (PRRT) and wellhead royalties.<sup>29</sup>

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<sup>27</sup> DMIRS. (2018c). *Petroleum Royalties*. Department of Mines, Industry, Regulation and Safety.  
<http://www.dmp.wa.gov.au/Petroleum/Royalties-1578.aspx>

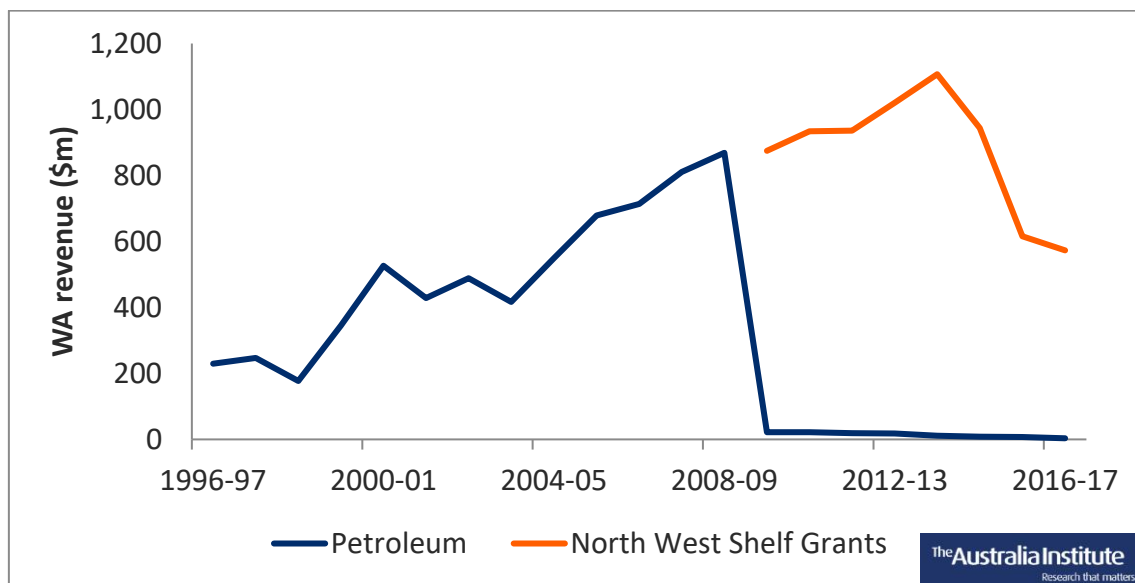
<sup>28</sup> ANAO. (2016). Collection of North West Shelf Royalty Revenue. Australian National Audit Office.  
<https://www.anao.gov.au/work/performance-audit/collection-north-west-shelf-royalty-revenue>

<sup>29</sup> Australian Government. (2017). *Petroleum Resource Rent Tax review: Final report*.  
<https://cdn.tspace.gov.au/uploads/sites/72/2017/04/PRRT.pdf>

The royalty rate for the North West shelf is set at between 10 per cent of the wellhead value for primary production licences and 11 and 12.5 per cent for secondary production licences<sup>30</sup>

The Western Australian government has received these royalties from the federal government, which has administered them in the form of North West Shelf Grants since 2009 (see Figure 10).

**Figure 10: Historical WA petroleum royalties**



Source: DMIRS (2018) Economic indicators 2017-18

Primarily because of the recent global price declines, total NWS wellhead and PRRT royalties peaked in 2014 at \$1.1 billion and have since dropped 48% to be now at \$576 million, levels last seen in 2005, despite production of LNG nearly doubling since that time (however crude oil and other petroleum products is flat in terms of output).

While this may seem a substantial sum, it needs to be seen in the context of the WA state budget and its \$29.5 billion in annual revenue. Petroleum royalties and NW Shelf Grants are expected to make up just 2 percent of the state budget. Iron ore royalties, by contrast, are worth more than \$4 billion per year, 14 percent of the budget.<sup>31</sup>

<sup>30</sup> The Treasury. (2016). *Petroleum Resource Rent Tax Review. Issues Note*. 20 December 2016. Australian Government. [https://static.treasury.gov.au/uploads/sites/1/2017/06/R2016-001\\_PRRT\\_dn.pdf](https://static.treasury.gov.au/uploads/sites/1/2017/06/R2016-001_PRRT_dn.pdf)

<sup>31</sup> WA Treasury (2018) Budget papers, <https://www.ourstatebudget.wa.gov.au/budget-papers.html>

A recent audit found that the administration of NWS royalties had a number of loopholes.<sup>32</sup> These include a lack of agreement about specific allowable deductions that reduce the wellhead value to which the royalty rate applies, though the amount of royalties in dispute from favourable accounting practices is a small fraction of the total.

## RESOURCE RENT ROYALTY

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While located near the North West Shelf, one specific onshore gas project—the Barrow Island project—pays a resource rent royalty (RRR) on gas produced under the petroleum lease 1H which covers the Barrow Island land area. This lease is currently owned by Chevron, which supplies gas domestically and for export.<sup>33</sup> Facilities located on the island are now expanded to accommodate processing for the newer offshore gas reserves in the Gorgon project.

A 25% share of RRR funds go to Western Australia, with the remaining 75% going to the federal government. The amount of royalties earned from this project are confidential.

## PETROLEUM RESOURCE RENT TAX

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In addition to the above royalty regimes, all petroleum projects in Australia, both onshore and offshore, have been subject to the federal Petroleum Resource Rents Tax (PRRT), a profits-based tax, since 2012. The PRRT applies at a 40 percent rate to a project's taxable profit, which is the revenue minus the project expenditure, but also allowing for allowances for exploration expenditure, and exploration expenditure transferred in from other related PRRT projects.

These extensive accounting deductions, as well as the generous starting asset cost base for established projects that were brought into the regime,<sup>34</sup> have made the tax

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<sup>32</sup> The Auditor-General. (2016). *Collection of North West Shelf Royalty Revenue*. ANAO Report No.28 2016–17 Performance Audit. Department of Industry, Innovation and Science.  
[https://www.anao.gov.au/sites/g/files/net4981/f/ANAO\\_Report\\_2016-2017\\_%2028.pdf](https://www.anao.gov.au/sites/g/files/net4981/f/ANAO_Report_2016-2017_%2028.pdf)

<sup>33</sup> DMIRS. (2018). *Petroleum and Geothermal Register. L1H Petroleum Lease*. Department of Mines, Industry, Regulation and Safety.  
<https://pgr.dmp.wa.gov.au/PGR/Titles/DisplayTitle.aspx?d=8v2GY5i675KQN5238LDJko2laFx8F8FipHEsxSa2HT3E%3d>

<sup>34</sup> Daley, J. et al. (2013). *Mineral Resources Rent Tax - will it work?* Grattan Institute.  
[https://grattan.edu.au/wp-content/uploads/2014/05/518\\_transcript\\_cities\\_melb\\_MRRT.pdf](https://grattan.edu.au/wp-content/uploads/2014/05/518_transcript_cities_melb_MRRT.pdf)

less effective as a revenue source in recent years. Revenue declines led to a review of the PRRT in 2016 which highlighted the generosity of this system to the producers.<sup>35</sup> Indeed, total PRRT revenues in 2015 were around \$900 million, which almost the same as they were in 1992, despite the massive expansion of the gas industry over that period.<sup>36</sup>

The recent high investment and exploration expenditure in the gas industry have created substantial deductions to the taxable profits of projects subject to the PRRT. Coupled with lower LNG prices, this means lower public revenues per unit of gas from new projects compared to older ones. This situation is widely acknowledged.

Western Australian Treasury documents last year suggested the giant new gas projects on the North-West Shelf, such as Chevron's \$US54 billion Gorgon LNG, might not pay PRRT for 20 to 30 years.<sup>37</sup>

The general gas royalty situation was summarised as follows by the WA government:

Western Australia's revenue benefits from petroleum resource driven investment growth, particularly for LNG projects, is otherwise limited.<sup>38</sup>

## PETROLEUM ROYALTIES IN CONTEXT

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In 2016-17, petroleum royalties were 2% of the \$27 billion total revenue of the WA government.<sup>39</sup> Royalties from other mineral resources were \$5.2 billion, or 19% of total revenues, with 90% of that royalty revenue coming from iron ore.

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<sup>35</sup> The Treasury. (2017). *Review of the Petroleum Resource Rent Tax*. Australian Government. <https://treasury.gov.au/review/review-of-the-petroleum-resource-rent-tax/>

<sup>36</sup> Murray, C. (2017). *Review of the Petroleum Resource Rent Tax (PRRT)*. Submission by Dr Cameron K. Murray for Prosper Australia. [https://static.treasury.gov.au/uploads/sites/1/2017/06/R2016-001\\_Propser-Australia.pdf](https://static.treasury.gov.au/uploads/sites/1/2017/06/R2016-001_Propser-Australia.pdf)

<sup>37</sup> Coorey, P. and A. Macdonald-Smith. (2017). *Petroleum resource rent tax to be tightened, existing projects exempted*. Australian Financial Review. 25 March 2017. <https://www.afr.com/news/petroleum-resource-rent-tax-to-be-tightened-existing-projects-exempted-20180324-h0xx7r>

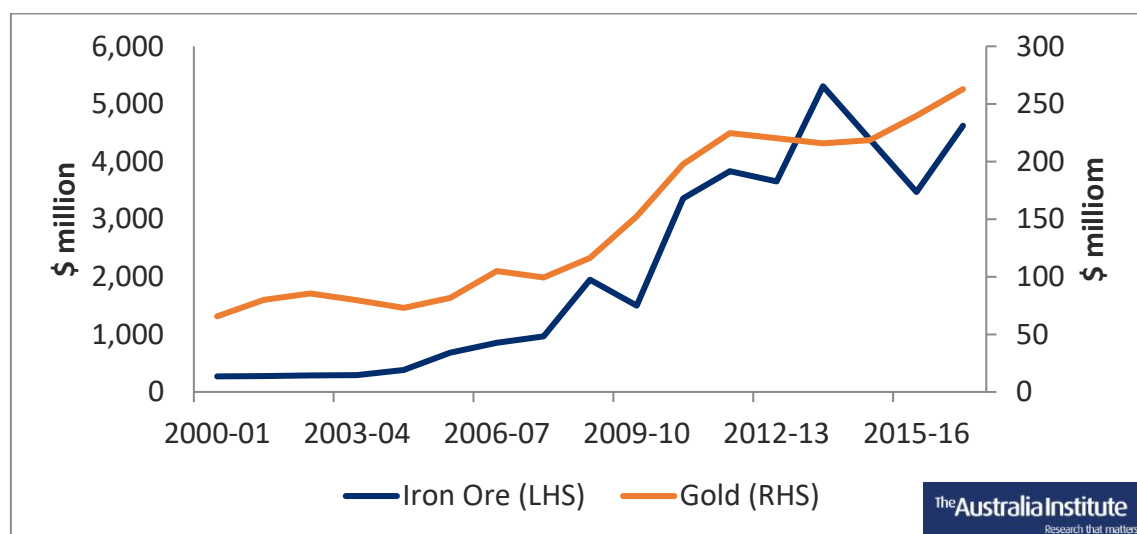
<sup>38</sup> Government of Western Australia. (2017). *Western Australia's submission to the review of the Petroleum Resource Rent Tax*. [https://static.treasury.gov.au/uploads/sites/1/2017/06/R2016-001\\_Western-Australian-Government.pdf](https://static.treasury.gov.au/uploads/sites/1/2017/06/R2016-001_Western-Australian-Government.pdf)

<sup>39</sup> Treasury. (2017). *2016-17 Annual Report on State Finances*. Government of Western Australia. <http://static.treasury.wa.gov.au/2016-17-arsf/2016-17-arsf-report.pdf>

What is fascinating is that decline in petroleum royalties is unique in the context of Western Australia's resource sector. Gold prices are down 30% from their 2012 peak, for example, but output and royalties are up (see Figure 11).

Similarly, iron ore prices halved between 2011 and 2017. Yet production increased 85%, pushing iron ore royalties up 20% since that time (though down 13% since their more recent 2014-15 peak) (see Figure 11). Despite iron ore royalties outperforming petroleum royalties, WA's National Party (unsuccessfully) took a policy to the last state election to increase the public's share of iron ore value by nearly \$3 billion per year. This suggests that the petroleum sector royalty regime is far from optimal.<sup>40</sup>

**Figure 11: Iron ore and gold royalties in WA**



Source: DMIRS. (2018b). *Mineral and Petroleum commodity review 2017*. Economic Indicators Resources Data. <http://www.dmp.wa.gov.au/About-Us-Careers/Latest-Statistics-Release-4081.aspx>

In general, the royalty regime for oil and gas seems to be inferior to that of other mineral resources, meaning less value from these resources is shared with the public.

<sup>40</sup> Richardson, D. (2016). *The \$5 levy on iron ore in WA*. Briefing Paper. Nov 2016. The Australia Institute. <http://www.tai.org.au/sites/default/files/P310%20The%20%245%20levy%20on%20iron%20ore%20in%20WA%20FINAL.pdf>

# Conclusions

As WA considers a future unconventional gas industry, it is important to understand the current state of the WA economy and existing gas industry. The WA economy is already heavily exposed to resource industries and the volatility that this brings. Relative to the size of the gas industry's recent expansion, little benefit has flowed to the state in terms of revenue or employment. Domestic gas prices and reservation policy may also come under pressure in the near future.

WA can learn from the experience of Queensland where a large unconventional gas industry exists and the Northern Territory, where another moratorium has just been overturned. The industry in both states has been strongly opposed by local communities.



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# Be careful what you wish for

*The economic impacts of unconventional gas in  
Queensland and implications for Northern Territory  
policy makers.*

Discussion paper

**Mark Ogge**

**November 2015**



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# Summary

The gas industry frequently claims that unconventional gas development has brought an economic and jobs boom to Queensland, and promises the same for the Northern Territory. Research into what has actually happened in Queensland paints a far less positive picture. Territorians should carefully examine industry claims about the economic and jobs impacts of unconventional gas development in the Northern Territory.

In contrast to the economic benefits initially promised by industry, recent gas industry-funded studies of the economic and social impacts of gas development in Queensland’s unconventional gas fields have found:

- Local business stakeholders reported a deterioration in:
  - Financial capital
  - Local infrastructure
  - Local skills
  - Social cohesion
  - The local environment
- Unconventional gas has affected community wellbeing:
  - Fewer than one in four local people approved of the unconventional gas industry, with less than 6% believing it would “lead to something better”. (See figures below)
- Unconventional gas creates few additional jobs:
  - Spillover jobs outside the gas industry were negligible. There were virtually no spillover jobs created in local retail or manufacturing.
  - Gas jobs will be reduced by 80% at the end of the construction period.
- For every 10 unconventional gas jobs created, eighteen agricultural jobs were lost.

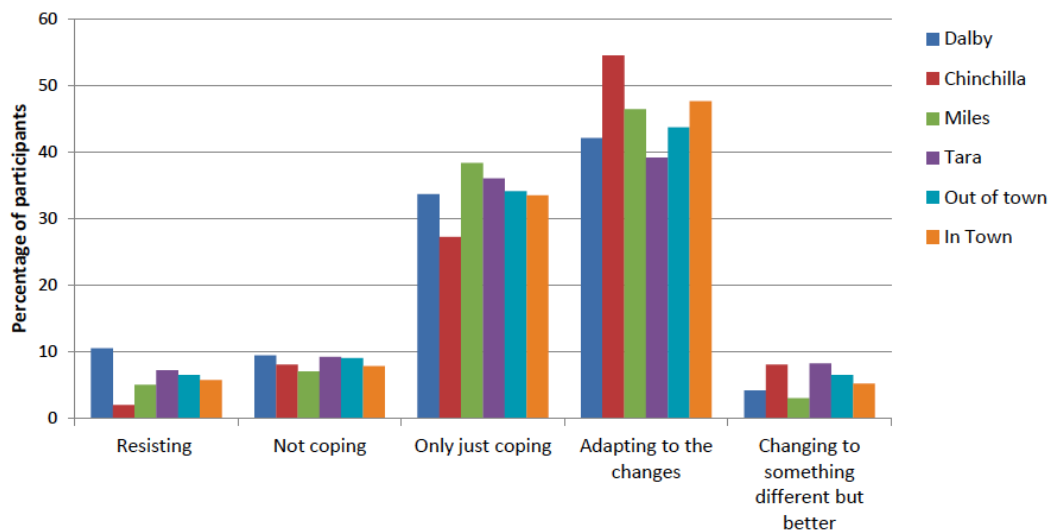
**Figure 1: The impact of unconventional gas development on local businesses**

***How did local business stakeholders in Queensland’s Darling Downs perceive the impact of unconventional gas and mining on their region?***

Source: CSRM University of Queensland

Financial capital	Worse
Infrastructure	Worse
Labour force skills	Worse
Social networks	Worse
Environment	Worse

**Figure 2: Perceptions community responses to CSG development in the area: Percentages.**



Source: Walton et al (2014) figure 19 p 21.

Benefits to the wider economy have also been less than anticipated. The industry emphasises the high *value* of the gas it exports, but that value largely flows to the gas companies rather than to the Australian community. As the Reserve Bank of Australia concluded:

The effect on Australian living standards will be less noticeable than [the increase in gas production] given the low employment intensity of LNG production, the high level of foreign ownership of the LNG industry and, in the near term, the use of deductions on taxation payments.<sup>1</sup>

At the same time, negative macro-economic impacts including exchange rate and interest rate increases and labour market impacts have displaced tourism, manufacturing and agricultural businesses and employment. The increase in domestic gas prices as a result of LNG exports linking Australia to global gas prices have caused very significant cost increases to Australian manufacturing.

<sup>1</sup> Cassidy and Kosev (2015) *Australia and the Global LNG Market*, RBA.

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# Introduction

Unconventional gas development inevitably causes significant negative social and economic impacts. A recent University of Queensland report noted that with respect to the “rapid change with development of an extensive coal seam gas industry and some large open cut coal mines” in southeast Queensland:

The effects of these multiple industries on each other, on environmental assets, infrastructure and economic and social systems entail many risks. Infrastructure shortfalls, a twospeed economy, widening social divisions, threatened livelihoods and stress in the face of rapid and far-reaching change associated with a new industry are evident in the words of those experiencing the impacts that provide the data reported in the paper.<sup>2</sup>

When seeking development approval, oil and gas companies justify the environmental and social impacts of their projects on the grounds that the projects will provide employment and other economic benefits that will result in net benefit to the wider community.

The huge profits at stake encourage companies to exaggerate these benefits of their projects and downplay their negative effects. These claims of employment and other economic benefits are made during the formal approval processes, public relations activities, and lobbying of policy makers.

Exaggeration has become routine for many resource companies, often reaching comic proportions. Notoriously, Rio Tinto claimed the Warkworth coal mine expansion in NSW would create 44,000 additional jobs despite the expansion only requiring 130 additional workers.<sup>3</sup> The NSW Land and Environment Court rejected the company’s claims and overturned the approval, a decision that was upheld by the Supreme Court of NSW.

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<sup>2</sup> Everingham et al 2016 Energy from the foodbowl: Associated land-use conflicts, risks and wicked problems.

<sup>3</sup> Martin P (April 2013) [Really Rio? The judge who put its claims about jobs to the test](http://www.petermartin.com.au/2013/04/really-rio-judge-who-asked-gentle.html) <http://www.petermartin.com.au/2013/04/really-rio-judge-who-asked-gentle.html> Accessed 17/8/16

Similarly, the proponents of the proposed Carmichael coal mine in Queensland's Galilee Basin claimed that the project would create 10,000 jobs. When challenged in court the company's own economic expert reduced this figure to 1,476 jobs.<sup>4</sup>

The main gas industry lobby group in Australia, the Australian Petroleum Production and Exploration Association (APPEA) recently claimed that shale gas development in the Northern Territory could result in a long-term employment boost of 6,300 full time positions in the NT and additional revenues to the NT Government of up to \$460 million a year.<sup>5</sup>

This claim is extraordinary because the employment number is more than twice the 3000 unconventional gas operational workforce employed in Queensland and more than twice the royalty projections of \$271 million for Queensland when the LNG trains are running at full capacity in 2020. Queensland is experiencing an unprecedented 1,500 PJ expansion gas development, equivalent to triple Australia's total domestic gas use, while the Northern territory is remote from export and domestic markets, has no proven shale gas reserves, and faces falling demand in Australian and overseas markets.

The APPEA claims are based on so called "Success" and "Aspirational" scenarios from a report APPEA commissioned from Deloitte Access Economics.<sup>6</sup> The authors themselves have little faith in the reality of these claims, stating:

Both scenarios utilise assumptions from a 'high consumption' planning scenario developed by the Australian Energy Market Operator (AEMO). As such, they do not necessarily represent expected outcomes. Rather, they are intended to reflect economic benefits that may accrue if the underlying 'upper-bound' assumptions materialise.

AEMO describes the "high consumption" scenario as a "stretch scenario" designed to provide "outlying views" of the future. With even major gas exporters (including APPEA members) pointing to a global glut in LNG, domestic gas demand projections being repeatedly downgraded, and subdued global growth, these assumptions appear

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<sup>4</sup> Branco J (April 2015) Adani Carmichael mine to create 1464 jobs, not 10,000. Brisbane Times. <http://www.brisbanetimes.com.au/queensland/adani-carmichael-mine-to-create-1464-jobs-not-10000-20150427-1mumbg.html> Accessed 17/8/16

<sup>5</sup> Robert M (January 2016) Gas is a great economic driver in the Northern Territory APPEA <http://www.appea.com.au/2016/01/gas-is-a-great-driver-of-financial-opportunity-in-the-northern-territory/> Accessed 17/8/16

<sup>6</sup> APPEA 2015, Economic impact of shale and tight gas development in the NT

heroic. It is particularly surprising that the report did not even consider the more realistic medium or low growth scenarios.

The DAE/APPEA report is also based on completely unrealistic assumptions of extraction costs of Northern Territory unconventional gas. The report assumes gas can be attracted for \$2.61 GJ.<sup>7</sup> This assumption is based on nothing except subtracting the processing and pipeline costs from the estimated break even costs.

In fact, shale gas extraction costs have been estimate by the Australian Council of Learned Academics (ACOLA), in the most detailed and credible assessment to date, at \$5–7 GJ.<sup>8</sup>

There can be serious consequences if policy makers accept industry claims uncritically.

Many of these projects have significant environmental and social impacts. When policy makers uncritically accept the economic claims of resource companies and industry lobby groups, it can override environment and social concerns. This can lead to serious negative impacts on the environment and local communities from projects that provide little benefit to the wider population.

The huge unconventional gas projects approved in Queensland in 2010 are a case in point. The economic claims of the proponents were not sufficiently scrutinised by the Queensland and Australian governments. Recent research examined in this paper clearly shows that few of the promised benefits have materialised. Existing businesses and industries have been badly affected. Long-term jobs in existing industries have been sacrificed for short-term gas construction jobs.

CSIRO surveys found that only 6% of local people living in gas field areas think that the industry has improved their lives – as many as are actively resisting it. As well as active resisters, a further 42% say that they are “not coping” or “only just coping” with the changes the industry has made to their lives.

Royalty payments to the people of Queensland are a small fraction of the estimates made when the projects were approved, with the Queensland Treasury admitting that these estimates were “overcooked”.

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<sup>7</sup> Deloitte Access Economics (2015) *Economic impact of shale and tight gas development in the NT*, technical appendices, [https://www.appea.com.au/wp-content/uploads/2015/08/APPEA\\_Deloitte-NT\\_Unconv\\_gas\\_FINAL-140715.pdf](https://www.appea.com.au/wp-content/uploads/2015/08/APPEA_Deloitte-NT_Unconv_gas_FINAL-140715.pdf)

<sup>8</sup> ACOLA (2013) *Engineering energy: Unconventional gas production*, <https://www.acola.org.au/PDF/SAF06FINAL/Final%20Report%20Engineering%20Energy%20June%202013.pdf>

Flow on economic activity has failed to materialise because companies have bypassed local industry and suppliers in favour of global supply chains. Local businesses invested in plant and equipment on the promise of gas field-related work only to be bypassed for global contractors. Local developers built entire suburbs to house workers and their families that now lie empty, with workers remaining in “temporary” workers camps.

The Northern Territory government has issued unconventional gas licenses for almost the entire territory. Speculative gas interests have a strong incentive to increase the value of their licenses by gaining environmental approvals and government promises to subsidise infrastructure.

Northern Territory policy makers can learn from the experience in Queensland. The economic claims of the unconventional gas industry must be subject to scrutiny and due diligence. Projects should only proceed if they provide a net benefit to the Northern Territory community, not just quick profits for gas companies.



# 1. The impacts of unconventional gas developments on local businesses

While some people and businesses benefit from unconventional gas development, many other businesses and industries can be negatively impacted and jobs in other sectors are often lost as a result.

The most advanced unconventional gas development in Australia is in Queensland's Darling Downs. The gas industry has often pointed to this region as an example of the economic benefits that unconventional gas provides local communities.<sup>9</sup> The research tells a more complicated story.

The most detailed examination of the economic impacts of unconventional gas development in the Darling Downs is a study carried out between 2008 and 2013 by the resource industry-funded Sustainable Minerals Institute (SMI) at the University of Queensland.<sup>10</sup>

This study surveyed stakeholders from different sectors in the local community, including the local business community, agriculture, local government, advocacy groups and environmental consultants, as well as the mining and unconventional gas industries.

The survey asked stakeholders to assess the effect of unconventional gas and mining in the region over a five-year period on the following key indicators:

1. **Financial capital:** Available revenue streams and economic resources.
2. **Built capital:** The physical infrastructure such as buildings, transport and equipment.
3. **Social capital:** The degree to which people know each other and collaborate and the level of trust people have in local organisations and institutions.

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<sup>9</sup> Natural Coal Seam Gas, Regional Development, APPEA  
<http://www.naturalcsg.com.au/benefits/regional-development/>

<sup>10</sup> Everingham, J, Collins, N, Rodriguez, D, Cavaye, J, Vink, S, Rifkin, W & Baumgartl, T (2013) *Energy resources from the food bowl: an uneasy co-existence. Identifying and managing cumulative impacts of mining and agriculture. Project report*, CSRM, The University of Queensland: Brisbane.

4. **Human capital:** Assets such as skills, knowledge, abilities and good health possessed by individuals that enable them to work, earn a living, contribute to society and thereby build other forms of capital.
5. **Natural capital:** Key natural resources, such as water, land, clean air, wildlife and forests that people can access for lifestyle or livelihood purposes.

All stakeholder groups other than those representing mining and unconventional gas believed that the development of mining and unconventional gas had a negative impact on all or most types of capital. Even the mining and unconventional gas industries thought that local infrastructure had deteriorated as a result of mining and unconventional gas development in the region.

**Figure 3: Stakeholder responses assessing the change in different types of capital over the last 5 years as a result of interaction between gas and other industries**

	Financial capital	Human capital	Built capital	Social capital	Natural capital
<b>Gas</b>	Better	Better	Worse	Better	Better
<b>Mining</b>	Better	Better	Worse	Better	Better
<b>Agriculture</b>	Worse	Worse	Worse	Worse	Worse
<b>Local business</b>	Worse	Worse	Worse	Worse	Worse
<b>Local government</b>	Worse	Better	Worse	Same	Same
<b>Community</b>	Worse	Better	Worse	Worse	Worse
<b>Advocacy</b>	Worse	Worse	Worse	Worse	Worse

Far from mining and unconventional gas providing economic benefits, local businesses felt that overall it had reduced financial capital, human capital, infrastructure, social capital and natural capital.

Local businesses have to compete with inflated gas industry wages in order to recruit and retain staff and they experience increased rent and competition for services (particularly trade and mechanical repairs). There are also disruptions to farmers from

the rollout of access roads, pipelines, water treatment plants and other infrastructure. Big increases in truck traffic tend to disrupt other forms of transport and damage roads.

Some businesses do benefit. Motels, bars and fast food chains experience a burst of demand during the brief construction phase, but may struggle afterwards. Waste disposal companies can profit from storing, transporting and treating the millions of litres of toxic “produced” or “flow-back” water and salt from the extraction process.

The CSRSM report includes statements from stakeholders discussing the effect of the gas and mining boom in the region on existing local businesses:

Obviously if you’ve got a major engineering or earth moving business, you attract business, you’re doing incredibly well, or a motel.

But, if you work in town at a local shop, or the council, you’re doing incredibly poorly, because your rents have gone through the roof and suddenly you’re flat out paying to be able to live in town. For us, we’re seeing increased costs.

All our professional services are \$100 an hour plus, whereas they used to be [in the] 40s and 50s. Freight is dearer. We can’t get labour. We’re relying on backpackers a lot more because we just can’t get permanent staff. So, it’s quite an added cost to one sector of the community, while the other sector booms.<sup>11</sup>

Having to compete with inflated resource industry wages was also of great concern:

What they’re paying for wages [in some towns] is two and half times what the wage should be – just to hold men. That’s forcing consumer goods up, to try to cover the costs of those wages... So it’s all spinning down the line... [For example] from a hardware perspective, anyone doing renovations to their home, even just the little bits are all getting more expensive because these guys are trying to cover the increase in wages that they’ve had to pay to retain men. And the [resources] companies are walking into businesses and offering staff – mainly mechanics... huge wages.<sup>12</sup>

Other stakeholders described the corrosion of social capital:

[I]n regards to a divide between people, not just landholders versus townies, but for instance I’ve got a lot of friends who used to work in agriculture and

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<sup>11</sup> Everingham et al, p 38.

<sup>12</sup> Everingham et al, p 39.

now work for gas companies – a lot of them. And some family members don't speak to them anymore because they're still on the land...

But even in towns now... once you would go to the local pub in Dalby, it was all full of farmers and that sort of thing and now you've got guys in their high vis' and after a few rums things are getting... they do, it's starting to get quite ugly. There's quite a bit of animosity going on. And agricultural communities have never been like that – they're not. And now that's building up pretty much.<sup>13</sup>

It is clear from interviews with businesses in unconventional gas development areas that the industry brings substantial costs. The CSRM study showed that business stakeholders perceived the costs as outweighing the benefits. Territory business organisations and policy makers should be aware of how this has played out in Queensland when considering the expansion of the gas industry in the NT.

Negative impacts on local businesses also affect communities at the social level. The next section examines the social impacts in more detail.

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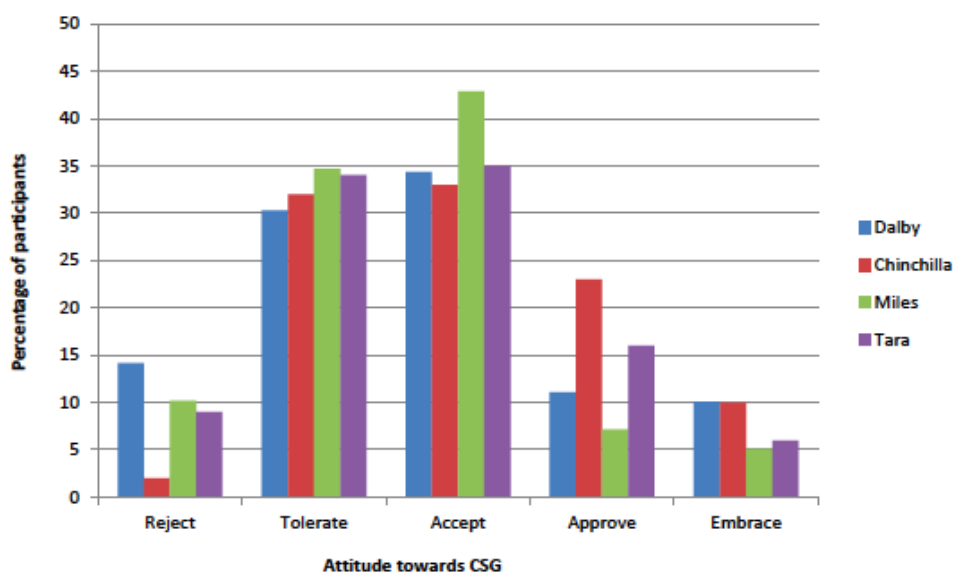
<sup>13</sup> Everingham et al, p 51.

## 2. Impacts on local communities

Unconventional gas development in Queensland's Darling Downs distresses local communities. Detailed surveys have shown that few people approve of the industry and even fewer believe that it will improve conditions.

A recent CSIRO survey of the Western Darling Downs found that almost half the local population was “only just coping” with, “not coping” with or actively resisting the changes to their communities caused by unconventional gas development (see figure below). This study was undertaken by researchers funded by the largest unconventional gas companies in Queensland, including Australia Pacific LNG and QGC.<sup>14</sup>

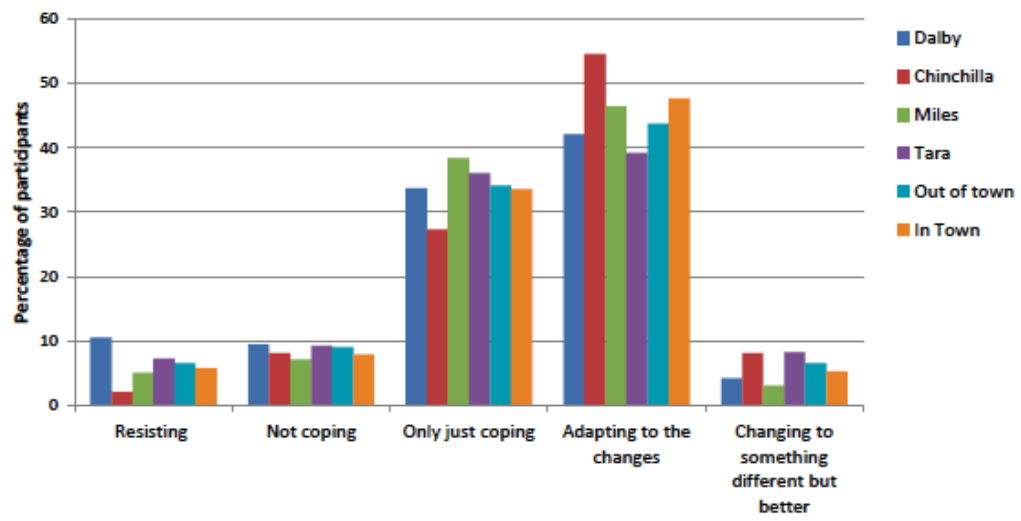
**Figure 4: Attitudes towards unconventional gas in the region by subregions**



Less than a quarter of people surveyed approved of the unconventional gas industry. Only 6% of people felt the community was improving as a result of the industry, while many were struggling to cope with the changes the industry had brought (see figure below).

<sup>14</sup> Walton, A, McCrear, R & Leonard, R (2014). *CSIRO survey of community wellbeing and responding to change: Western Downs region in Queensland*, CSIRO Technical report: CSIRO, Australia.

Figure 5: Community responses to unconventional gas development in the Western Downs, Queensland

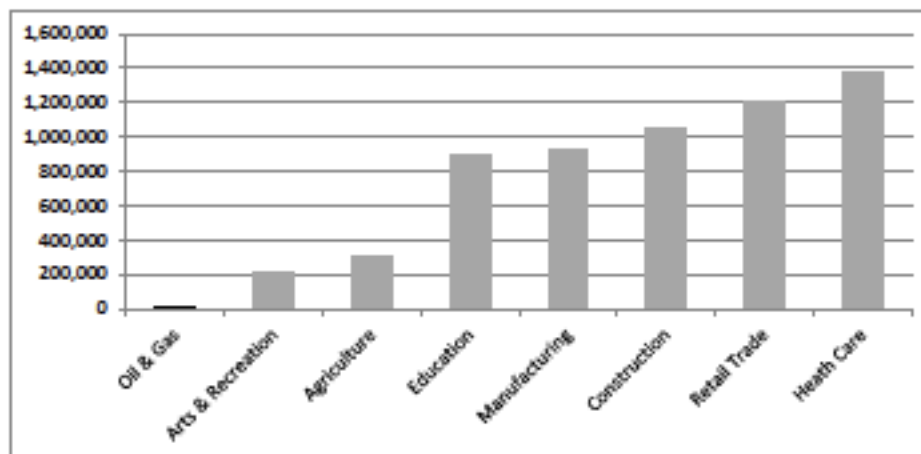


### 3. Unconventional gas is a small employer

According to the Australian Bureau of Statistics, in May 2015 the entire oil and gas industry in Australia employed 27,500 Australian workers, or less than a quarter of 1% of the workforce.<sup>15</sup>

By way of comparison, the total employment provided by the oil and gas industry is considerably less than the retail hardware store Bunnings's, which employs 33,000.<sup>16</sup>

**Figure 6: Employment in Australia by selected industry (2014)**



Source: ABS (2014).

In Queensland the oil and gas industry employed 4,500 people as of February 2016, less than one fifth of 1% of the Queensland workforce of 2.4 million.<sup>17</sup>

This number is likely to continue to decline significantly. The vast majority of gas jobs are during the construction phase. As the construction phase winds up, the

<sup>15</sup> ABS (2013a). 6291.0.55.003 *Labour Force, Australia, Detailed, Quarterly, September 2015*, Australian Bureau of Statistics, accessed 11/11/15, <http://www.abs.gov.au/ausstats/abs@.nsf/mf/6202.0>

<sup>16</sup> Bunnings (2013). *About Us: Who we are*, Bunnings, viewed 21 November 2013, <http://www.bunnings.com.au/about-us>.

<sup>17</sup> ABS 2016 Employed person by industry subdivision table EQ06.

unconventional gas companies operating in Queensland are cutting their workforces by around 80%.<sup>18</sup>

Territorians seeking employment for any unconventional project in the Northern Territory will have to compete with experienced workers from interstate. The gas industry requires experienced, skilled workers. With the wind-down of the CSG construction boom in Queensland, there is a large pool of highly-qualified workers who are more likely to fill positions than unskilled Territorians with no experience in gas field construction and operation.

Experience in Queensland has shown that construction workforces are largely male non-residential workers living in workers camps on the outskirts of towns. These workers are often referred to as fly-in, fly-out (FIFO) or drive-in, drive-out (DIDO).

When local people are employed on these projects, they are unlikely to be previously unemployed people. The gas industry prefers to employ skilled workers, often drawn from local manufacturing and agriculture businesses.

As explained above in section 1, these local businesses often choose not to replace these skilled staff due to high labour costs resulting from having to compete with gas industry wages, and the risk of losing staff to the industry once they have been trained.

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<sup>18</sup> Bureau of Resource and Energy Economics, *Resource and Energy Major Projects 2013*.

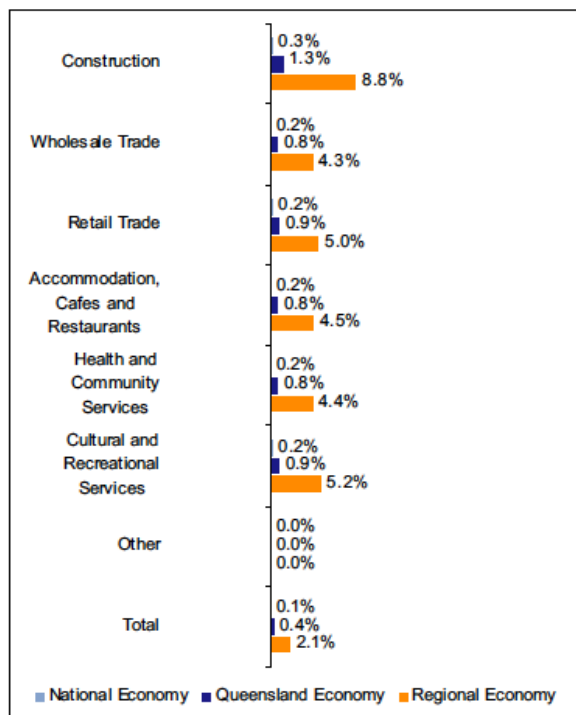


## 4. Jobs: promise versus reality

As discussed in section 3, unconventional gas extraction employs relatively few people. These jobs are mostly short term and largely non-residential workers. The industry claims that the flow on effects result in people being employed elsewhere in the community. However, recent research shows that flow on jobs have largely failed to eventuate.

For example, the original Economic Impact Statement submitted to gain approval for the largest unconventional gas project in Queensland, Australia Pacific LNG (APLNG), claimed that the construction phase of the project would increase regional employment in the retail trade by 5 per cent, and in a range of regional service sectors by between 4.5 and 5.2 per cent.<sup>19</sup>

**Figure 7: Australia Pacific LNG direct and indirect employment by industry**



Source: KPMG, *APLNG EIS Economic Impact Assessment report*, chart 5.3, p 29.

<sup>19</sup> KPMG, *APLNG EIS Economic Impact Assessment report*, Chart 5.3 p29.

The reality was very different. At the height of the construction boom in 2013, a study was undertaken by the Gas Industry Social and Environmental Research Alliance (GISERA) into the local economic impacts of the unconventional gas boom.

The study examined the actual economic impacts of unconventional gas development in Queensland's gas fields. While the study found higher income growth in CSG regions during the construction boom compared to other regions, it found that there was virtually no flow on employment to non-mining businesses. In the words of the authors, "job spillovers into non-mining employment are negligible"

As we can see in the figure below, the study found that while there was an increase in short term construction related jobs (construction and professional services), there were virtually no additional jobs in retail or manufacturing as a result of unconventional gas development.<sup>20</sup>

**Figure 8: Unconventional gas employment spillovers in different sectors of Queensland's Darling Downs economy**

	Elasticity	Additional job for each new CSG job
<b>Local goods sector</b>		
Construction	0.832 (0.426) *	1.412
Professional services	0.704 (0.259) **	0.412
Retail trade	0.011 (0.140)	0.024
Services <sup>†</sup>	-0.205 (0.230)	-0.732
<b>Traded sector</b>		
Manufacturing	0.068 (0.199)	0.160

Notes: Elasticity values are 2SLS estimations for coefficient  $\psi$  in equation (2). The number of CSG wells in an SLA is used as instrument for the log change of mining employment. Values estimated using sample 3 (n = 48). F-stat first-stage = 10.74. Robust clustered std. errors at LGA levels in parentheses. \*p < .10. \*\*p < .05. <sup>†</sup>Services sector include employment in accommodation, rental agencies, transport and 'other services'.

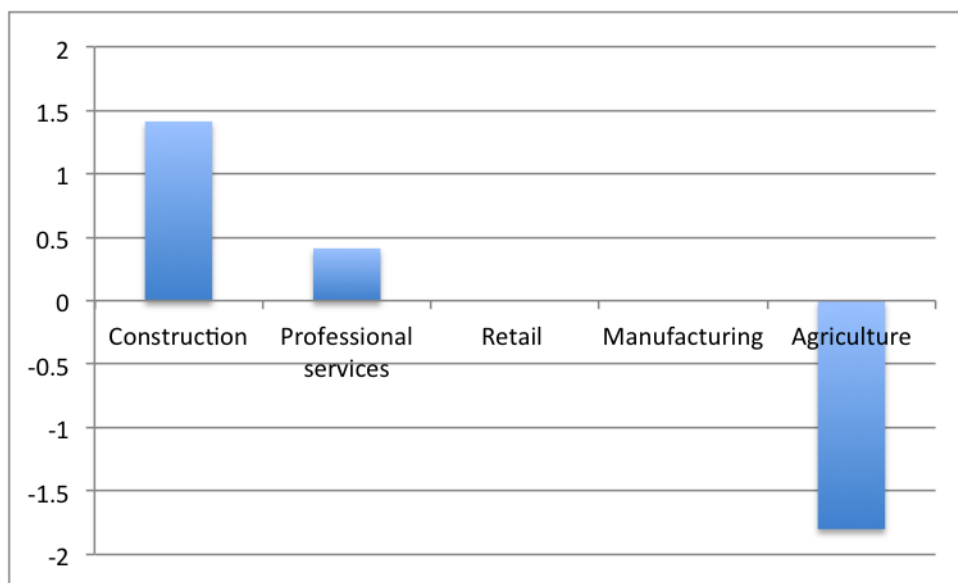
Source: Flemming and Measham (2013)

A subsequent study by the same authors found that for every ten people employed in CSG, eighteen agricultural jobs were lost.<sup>21</sup>

<sup>20</sup> Fleming, D & Measham, T (2013) *Local economic impacts of an unconventional energy boom: the coal seam gas industry in Australia. Report to the Gas Industry Social and Environmental Research Alliance (GISERA)*. June 2013. CSIRO, Canberra.

<sup>21</sup> Flemming, D & Measham, T (2015a) "Local economic impacts of an unconventional energy boom; The coal seam gas industry in Australia", *The Australian Journal of Agricultural and Resource Economics* 59(1) pp 78-94

**Figure 9: Spillover job impacts per CSG job**



Source: Flemming and Measham (2013 and 2015a).

In other words, the unconventional gas boom had virtually no employment benefits outside of the gas industry itself. In the words of the authors, “job spillovers into non-mining employment are negligible”. It also shows that agricultural jobs were lost and that the employment gains were almost entirely in short term construction jobs and professional services jobs (largely related to the construction phase).

The Queensland unconventional gas boom is one of the largest and most rapid resource expansions ever seen, and yet it led to virtually no increase in employment in local retail or manufacturing, and a significant loss of agricultural jobs.

The lack of any increase in retail employment in local communities is largely a result of the predominance of non-resident workers living in self-contained workers camps. These employees work long shifts that limit opportunities to spend their income in the local community.

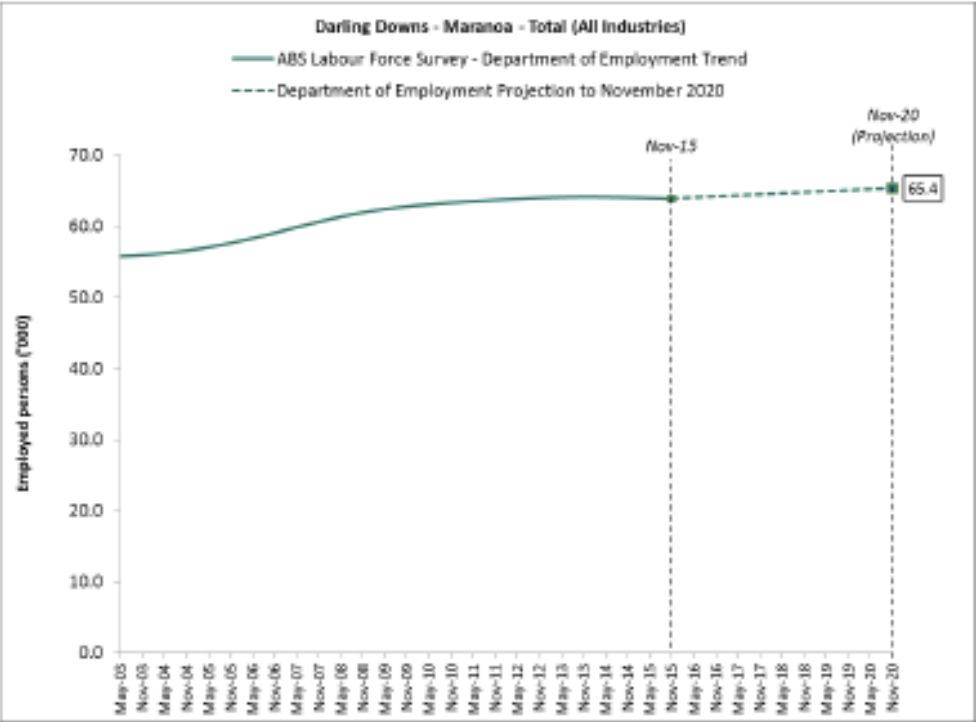
## OVERALL EMPLOYMENT IMPACTS OF CSG DEVELOPMENT ON JOBS IN THE DARLING DOWNS

The lack of spillover jobs in local areas is demonstrated by the Australian Bureau of statistics employment data for the Darling Downs Maranoa region during the CSG construction boom.

The Darlings Downs Maranoa region has the greatest concentration of CSG development in Queensland to date. Despite this overall employment in the region

remained flat over the CSG construction boom period with no evidence of a jobs boom in the region.

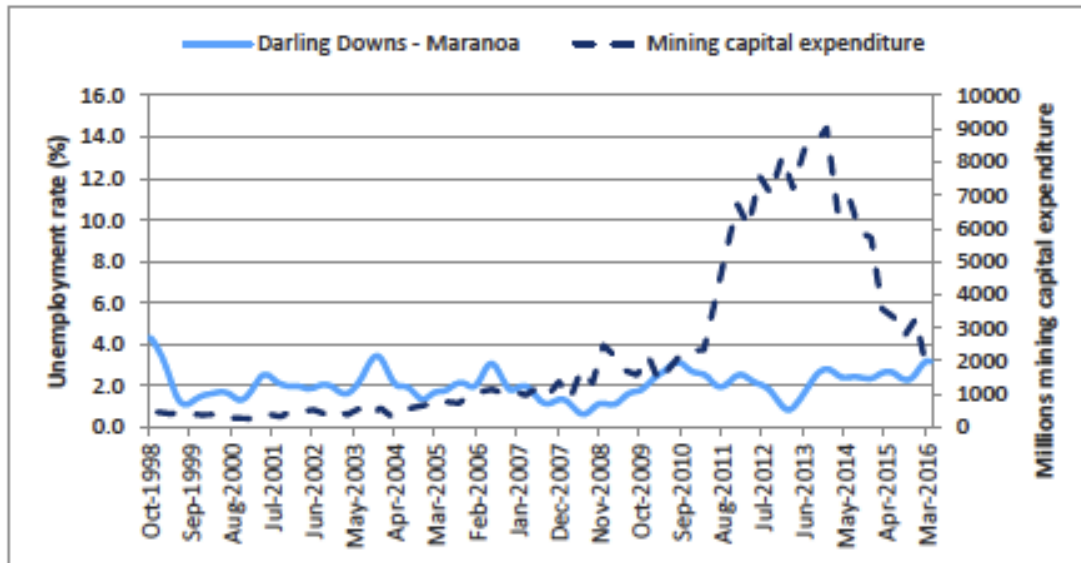
**Figure 10: Total employment, historical and projected – Darling Downs-Maranoa**



*LMIP (2016) Regional Employment Projections*

Nor does CSG development appear to have led to any significant reduction in unemployment. Fluctuations in unemployment remain similar to fluctuations in the decade prior to the commencement of CSG development.

Figure 11: Unemployment rate – Darling Downs-Maranoa

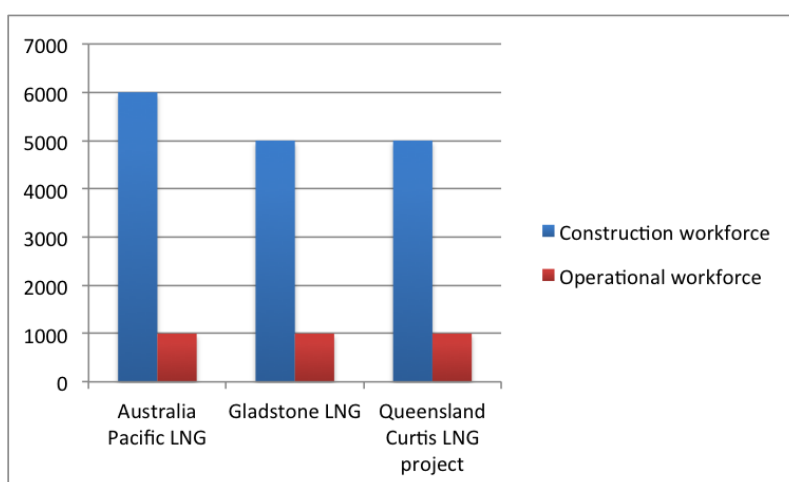


Source: Trend, Conus (2016) *QLD Regions Jobs Data – Conus Trend* (derived from ABS original); Current prices, ABS Cat no. 5625.0 Private New Capital Expenditure and Expected Expenditure.

## 5. Boom and bust

According to the Office of the Chief Economist of Australia, the three unconventional gas projects in Queensland employed 16,000 people during their brief construction phase.<sup>22</sup> The companies estimate that the workforce will be reduced by over 80% to 3,000 employees as the projects enter their operational phase.<sup>23</sup> This will represent less than 0.13% of Queensland's total workforce of over 2.3 million.<sup>24</sup>

**Figure 12: Queensland unconventional gas operation and construction employment**



Source: Office of the Chief Economist of Australia (2015).

The construction workforces may have been considerably smaller than reported by the Office of the Chief Economist. The office based the numbers on “fact sheets provided by the companies”.<sup>25</sup> APLNG, the largest of Queensland's LNG projects says in its Economic Impact Assessment that “over the 11-year construction phase, there will be an approximate average of 3,300 people working on the Australia Pacific LNG project each year. Employment will peak from 2012 to 2014 inclusive”. This is a little over half the number reported by the Office of the Chief Economist but would still represent

<sup>22</sup> The length of the construction period varies between the projects. In the case of Gladstone LNG, the construction period was 4 years. URS (2009) *GLNG Economic Impact Statement*.

<sup>23</sup> Office of the Chief Economist, *Resources and Energy Major Projects list April 2015*, accessed 11 November 2015, <http://www.industry.gov.au/Office-of-the-Chief-Economist/Publications/Pages/Resources-and-energy-major-projects.aspx>

<sup>24</sup> ABS Labour Force Statistics.

<sup>25</sup> Correspondence with the Office of the Chief Economist.

more than a two-thirds reduction in the workforce between the construction and operational phase.

Any unconventional gas project in the Northern Territory would employ far fewer workers than in Queensland.

A large proportion of both the construction and operational workforce in Queensland worked on assembling the LNG terminals at Gladstone. Additional LNG terminals will not be required in the Northern Territory, as the gas will be exported via the Queensland terminals.

There is also likely to be a large pool of experienced gas workers in Western Australia and Queensland who are well placed to fill Northern Territory unconventional gas jobs. The three Queensland LNG terminals, the Northern Territory Inpex Ichthys project and several Western Australian LNG terminals and offshore gas fields were all built simultaneously. The decision to allow all these projects to be built simultaneously created an acute skills shortage at the time. With the wind down of the construction phase of these projects there is an abundance of interstate skilled gas construction workers who will be far better placed to work on any gas projects in the NT than unemployed NT residents who lack these skills.

To the extent that NT residents are employed, they are likely to be skilled workers already employed in other industries, particularly manufacturing and agriculture. This effect drives up costs for other industries as they are forced to compete with the oil and gas industry for skilled workers.

## 6. Impacts on manufacturing

The rapid expansion of unconventional gas projects has damaged Australia's manufacturing industry through its labour market impacts and effect on gas prices.

Economic modelling by the Queensland unconventional gas company Arrow LNG for its Economic Impact Assessment found that this project would displace \$441.5 million worth of manufacturing output and 1,000 manufacturing jobs in Queensland.<sup>26</sup>

Arrow LNG is just one of the four large unconventional gas projects in Queensland. The full employment impacts of this single project can be seen in the figure below.

While the modelling suggests that the project would create a considerable number of short term construction jobs, these jobs come at the expense of long term jobs in other sectors, particularly manufacturing.

Once extinguished, manufacturing activity is difficult to rebuild. Plants and equipment require a large upfront investment, but only deliver returns over the long term. If a region is likely to experience further disruption from large resource projects, investors are unlikely to have confidence in manufacturing.

**Figure 13: Average Annual Impact on Employment by Industry in Queensland of Arrow LNG project**

Industry	Change in Employment (FTEs)			
	2013-14 to 2016-17 (Phase 1 Construction)	2018-19 to 2021-22 (Phase 1 Steady State Operation)	2022-23 to 2024-25 (Phase 2 Construction) <sup>(a)</sup>	2026-27 to 2029-30 (Phase 2 Steady State Operation) <sup>(a)</sup>
<b>Queensland</b>				
Agriculture	-59	-24	-66	-42
Mining	-65	-28	-69	-50
Manufacturing	-1,089	-25	-804	-200
Electricity and water	-10	25	39	55
Construction	1,833	127	1,325	257
Trade	221	58	255	130
Transport and storage	-246	-27	-186	-37
Business, finance and insurance services	-132	83	119	166
Public administration, defence, health and education	29	-6	-45	-19
Recreation and other services	22	-4	1	-8
Ownership of dwellings	6	0	3	0
<b>Total Change in Employment in Queensland</b>	<b>511</b>	<b>180</b>	<b>571</b>	<b>251</b>

Note: (a) It should be noted that operation of Phase 1 (trains 1 and 2) is ongoing during these time periods.  
Source: Prime Research (unpublished).

Source: AEC Group (2011) Arrow LNG Economic Impact Assessment, table 5.3 p 43.

<sup>26</sup> Grudnoff (2015) *An analysis of the economic impacts of Arrow Energy's Gladstone LNG Plant*.



## GAS PRICES

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As well as higher labour costs, unconventional gas projects have significantly increased the cost of gas for Australian manufacturers.

CSG exporters made it clear to their investors that linkage to international markets would increase gas prices in Australia, thus increasing the value of gas these companies sold to Australian customers.

However, at the same time they omitted or downplayed this impact in their applications to governments to gain approval for their projects

For example, in their Economic Impact Assessment of 2010, GLNG noted that “a relatively mild increase in gas prices associated with the QCLNG Project may occur in the eastern Australian market”.<sup>27</sup>

At the same time Santos, the lead GLNG joint venture partner, told its investors that that the linkage of Australian gas prices to global prices as a result of unconventional gas LNG exports would “transform” its asset base by exposing all but legacy domestic gas contracts to oil price rises. In other words, the gas that they had been selling to Australian customers would now be linked to Asian prices, which at the time were relatively high. Increasing the price they were able to sell gas to Australian customers for, particularly manufacturers, was central to their commercial strategy, not an unintended by-product of it. The Santos 2011 Annual Report lists “Increasing exposure to oil-links prices as one of the three pillars of its corporate strategy.

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<sup>27</sup> *GLNG Economic Impact Statement*, volume 8 chapter 10, p 12.

**Figure 14: Santos “Vision and Strategy”**

### VISION AND STRATEGY

Santos’ vision is to be a leading energy company in Australia and Asia, and the company has a robust strategy to achieve this by:

Continuing to be a leading Australian domestic producer.

- Strong 50-year track record of safe, sustainable operations.
- Presence in every major Australian hydrocarbon basin, with oil, conventional gas and unconventional gas assets.
- Increasing exposure to oil-linked gas prices.

Source: Santos (2011) *Annual Report 2011*, p 2.

In fact, linking Australian domestic gas prices to higher Asian prices has more than doubled the wholesale gas price.

The recent collapse in the oil price, and subsequently Asian “oil linked” gas prices, has not caused a commensurate reduction in the price of gas being offered to manufacturers. This has led to claims of “cartel like behaviour”.<sup>28</sup> The ACCC’s 2015 inquiry into the East Coast gas market is investigating “the existence of, or potential for, anti-competitive behaviour and the impact of such behaviour on purchasers of gas”.<sup>29</sup> While not finding evidence of collusion between companies on domestic gas prices, it found that the exercise of “market power” by the gas suppliers was a key reason for prices remaining high.

Economic modelling by Deloitte Access Consulting shows that east coast gas price rises caused by unconventional gas exports have created an \$81 billion windfall for the gas

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<sup>28</sup> West, M (October 2015) “East coast gas market has all the hallmarks of a cartel”, accessed 11 November 2015, <http://www.smh.com.au/business/comment-and-analysis/east-coast-gas-market-has-all-the-hallmarks-of-a-cartel-20151011-gk6b4i.html>

<sup>29</sup> ACCC Project Overview, *East Coast Gas Inquiry*, accessed 11 November 2015, <https://www.accc.gov.au/regulated-infrastructure/energy/east-coast-gas-inquiry-2015>

industry (mostly global oil and gas majors), but will cost the manufacturing industry \$118 billion (see figure below).<sup>30</sup>

**Figure 15: Industry output impacts for Australia as a result of gas price increases**

**Table i: Industry output impacts for Australia for the years 2015, 2018 and 2021 and cumulative Net Present Value (NPV) of output impacts over 2014 - 2021**

	Value of difference from baseline			% difference			NPV
	2015	2018	2021	2015	2018	2021	Cumulative impact over 2014-2021
<b>SKM scenario</b>							
<i>Output (\$ million)</i>							
Manufacturing	-23,199	-22,259	-30,386	-3.97	-3.48	-4.38	-118,069
Gas	8,922	17,672	24,225	47.81	65.63	57.07	80,746
Mining	-7,226	-6,031	-9,679	-3.55	-2.69	-3.96	-33,804
Agriculture	-1,110	-798	-1,430	-1.98	-1.32	-2.21	-4,705
Electricity and Water	-1,962	-1,989	-2,204	-3.36	-3.09	-3.12	-10,269
Construction and Trade	18,049	2,443	13,265	2.80	0.34	1.69	38,519
Transport	-2,328	-1,988	-3,288	-1.68	-1.31	-2.00	-11,044
Commercial & Services	3,015	-897	649	0.26	-0.07	0.05	1,695

Source: Deloitte Access Economics

Note: The discount rate of 7% was used to calculate the NPV figure.

Source: Deloitte Access Economics (2014).

<sup>30</sup> Deloitte Access Economics (2014) *Gas market transformations—Economic consequences for the manufacturing sector*, Table 1, p 3.

## 7. Big numbers, small benefits

Gas companies often cite their contribution to economic activity (Gross State Product, GSP, or Gross Domestic Product, GDP) as a measure of the economic benefits of their projects.

GSP and GDP are the state and national measures of economic output. These include the Net Present Value (NPV) of goods and services provided by different industries, including the oil and gas industry.

The value of the gas sold by the gas industry goes to the gas companies that sell the gas. For example, a Korean power company can buy Northern Territory gas from a Japanese gas company that is licensed to extract the gas (like Inpex), and while the value of the gas sold is counted as GDP or GSP, the money will be transferred from the Korean power company to the Japanese gas company and not reach Australian shores.

The main ways that the people of the Northern Territory, or residents of other states and Australia as whole, can benefit from this transaction are taxes and royalties, employment of local people and the flow on business to Australian businesses.

As such, the GSP or GDP numbers themselves say little about the benefits that flow to Australians or Territorians. These will depend on the amount of tax and royalties the companies pay, how much of their expenditure on goods and services flows to Australian businesses and whether the profits accrue to Australian companies or foreign owned companies.

The oil and gas industry operating in Australia is over 80% foreign owned,<sup>31</sup> which means that over 80% of the profits go directly off shore. It imports almost all of its equipment and pays very low rates of tax.

The construction of the three huge LNG export and processing facilities at Gladstone in Queensland illustrate the industry's preference for sourcing materials and equipment from overseas.

All three export terminals were built by the global oil and gas engineering company Bechtel. On their website, Bechtel promote their "efficiency" in not employing Australians. The website page shown in the figure below describes all three of the Gladstone LNG Processing plants and export terminals as being designed by Bechtel

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<sup>31</sup> Calculations by The Australia Institute based on published 2P reserves and production.

engineers in Houston, Delhi and Shanghai, to be built in the Philippines, Indonesia and Thailand. The terminals were then floated over to Australia to be assembled.<sup>32</sup>

**Figure 16: Bechtel description of design and construction process for their Curtis Island LNG terminals in Queensland**



Source: Bechtel Website.

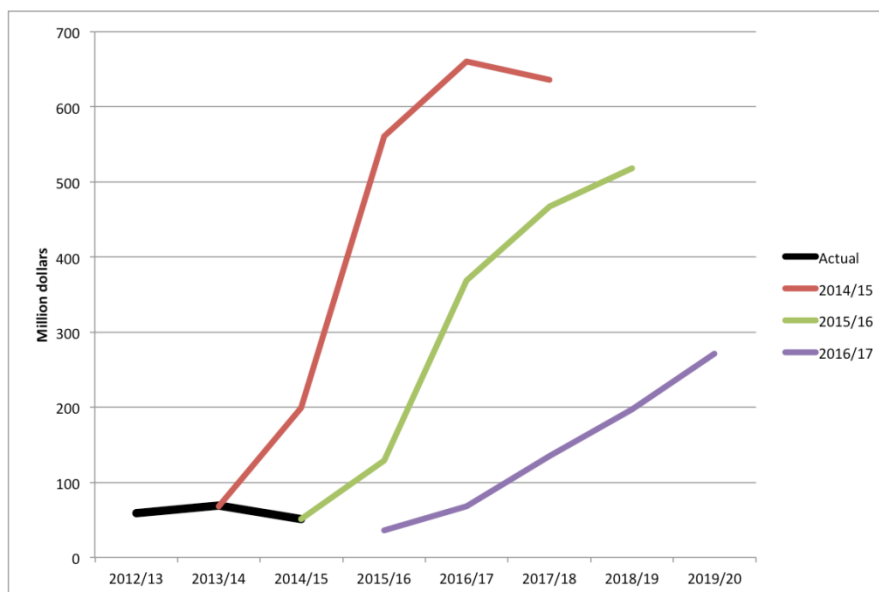
The Queensland LNG projects were approved without an estimate of royalty payments to the state government. Subsequent Queensland Treasury estimates of gas royalties have been slashed to around one third over the past five years (see figure). Treasury acknowledges that original estimates were “overcooked”.<sup>33</sup> APLNG is now challenging the Queensland Government’s royalties rulings.<sup>34</sup>

<sup>32</sup> Bechtel website, accessed 10 November 2015 <http://www.bechtel.com/projects/curtis-island-lng/>

<sup>33</sup> Ludlow, M (February 2016) “Queensland faces LNG royalties crunch”, *The Australian*, accessed 1 April 2016, <http://www.afr.com/business/energy/gas/queensland-faces-lng-royalties-crunch-20160207-gmnle0>

<sup>34</sup> Ludlow (February 2016)

**Figure 17: Queensland Treasury royalty projections actual vs projected 2012–2015**



Source: Queensland Budget Papers 2012–2015.

Corporations operating in Australia are required to pay company tax to the Commonwealth Government. The current company tax rate is 30%, however all taxpayers are entitled to a number of deductions.

In 2015 the Australian Tax Office published the amount of corporate tax paid Australia’s largest companies. The very low amounts paid by many of these companies elicited a strong response from many sectors of the community.

The oil and gas industry was one of the industries singled out for particular criticism. The very low amounts of corporate tax paid by these companies are partly the result of creative transactions that reduce the amount of taxable income earned in Australia.

The low amounts paid by Origin (3.6% of total income), Shell (0.35%) and Santos (0.07%) have been partly attributed to practices such as transfer pricing.<sup>35</sup>

The big numbers for capital value or change in GDP tell us little about the benefit of gas exports to the wider Australian economy and community. As the Reserve Bank of Australia concluded in a recent paper on Australian LNG, while Australian production of LNG is expected to ramp up substantially over the next few years:

<sup>35</sup> Ludlow, M (April 2016) “Origin LNG consortium used ‘transfer pricing’ to cut taxes”, *Australian Financial Review*, <http://www.afr.com/news/politics/origin-lng-consortium-used-transfer-pricing-to-cut-taxes-20160426-gofb0q>

The effect on Australian living standards will be less noticeable than this given the low employment intensity of LNG production, the high level of foreign ownership of the LNG industry and, in the near term, the use of deductions on taxation payments.<sup>36</sup>

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<sup>36</sup> Cassidy, N & Kosev, M (2015) *Australia and the Global LNG Market*, RBA.

## 8. The industrial footprint of shale gas

One important way in which unconventional gas development differs from other types of resource development is that it covers far greater areas. Mines are generally highly concentrated with relatively small footprints, but unconventional gas fields often cover tens of thousands of square kilometres with an industrial grid of wells, pipelines, access roads, compressor stations and water treatment plants.

The most mature shale gas field in the US, the Barnett Shale, has an average of 1.15 wells per square kilometre, but can be as high as 6 wells per square kilometre due to “infill drilling” needed to extract gas as fields deplete.<sup>37</sup>

Every shale gas well needs to be fracked multiple times. Every frack requires 11–34 million litres of water,<sup>38</sup> the equivalent of 360–11,000 truckloads, and 80–300 tonnes of industrial chemicals.<sup>39</sup> This is potentially an enormous increase in truck movements on the Territory’s roads and will inevitably impact other road users.

Pennsylvania in the United States has a mature shale gas industry. A gas industry study last year in Pennsylvania found that more than 6% of gas wells leaked, and up to 75% of wells could have some form of integrity failure.<sup>40</sup> In Pennsylvania more than 240 private drinking water wells have been contaminated or have dried up as the result of drilling and fracking operations over a seven-year period.<sup>41</sup>

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<sup>37</sup> *Shale Gas Information Platform SHIP*. GFZ, accessed 10 November 2015, <http://www.shale-gas-information-platform.org/categories/operations/the-basics.html>

<sup>38</sup> *UNEP Global Environmental Alert Service: Gas Fracking: Can we safely squeeze the rocks?*

<sup>39</sup> Hazen and Sawyer (22 December 2009) *Impact Assessment of Natural Gas Production in the New York City Water Supply Watershed*.

<sup>40</sup> Davies, RJ, Almond, S, Ward, RS, Jackson, RB, Adams, C, Worrall, F, ... Whitehead, MA (2014) “Oil and gas wells and their integrity: Implications for shale and unconventional resource exploitation”, *Marine and Petroleum Geology*, 56, 239–254. doi: 10.1016/j.marpetgeo.2014.03.001

<sup>41</sup> Concerned Health Professionals of New York & Physicians for Social Responsibility (14 October 2015) *Compendium of scientific, medical, and media findings demonstrating risks and harms of fracking (unconventional gas and oil extraction)* (3rd ed.), <http://concernedhealthny.org/compendium/>



# Conclusion

Gas companies routinely exaggerate the economic and jobs benefits of their projects. Too often policy makers accept these claims unquestioningly.

The Northern Territory is fortunate to have the Queensland unconventional gas experiment to reflect upon. The Queensland experience is that most of the economic benefits do not materialise, and serious collateral damage is done to existing industries and local communities.

If policy makers in the Northern Territory naively accept the economic claims of speculative gas companies and use taxpayer money to support this industry, Territorians will live the consequences for decades to come.

# Just to cap it off

## Submission to the 2019 Review of the Australian Domestic Gas Security Mechanism (ADGSM)

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*The ADGSM entrenches high domestic gas prices by enabling the LNG industry to supply just enough gas to avoid a “shortfall year”, but not so much that domestic prices reduce. The solution is to reduce Australia’s gas dependence through efficiency and fuel switching, combined with a cap on LNG exports.*

Submission

Mark Ogge

September 2019

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# Summary

There is no gas shortage in Australia. Australia produces three times the amount of gas required to meet the demand of Australian customers. The only sense in which there is a potential gas shortage is to the extent that LNG producers and other large gas producers can choose to export gas to overseas customers instead of Australian customers. As well as exporting gas they have developed for export, they can (and do) export large quantities of gas from fields that were developed for the Australian market. No matter how much gas is produced in Australia, it can simply be exported.

The Australian Domestic Gas Security Mechanism (ADGSM) is effective in incentivising LNG producers to supply just enough gas to Australian customers to avoid a shortfall, but does so in such a way as to entrench high gas prices.

Because the design of the ADGSM allows LNG companies to avoid export controls being imposed by offering the minimum amount of gas required to avoid the determination of a “shortfall year” by the Minister, they are effectively constraining supply to maintain high domestic gas prices. There is no incentive to supply a quantity of gas that would reduce prices for Australian customers.

In a market-based economy, firms operate to maximise profits. Governments should not expect that gas producers will ever increase domestic supply to the point that it lowers price and their profits. If the objective of government policy is to reduce price, then further changes need to be made.

The first priority should be to reduce the exposure of Australian households and businesses to high gas prices. This can be achieved through fuel switching from gas to efficient electrical systems for space and hot water heating, which make up the vast bulk of residential and commercial gas use. Electric systems are already cheaper than using gas and will significantly reduce power bills for households and businesses.

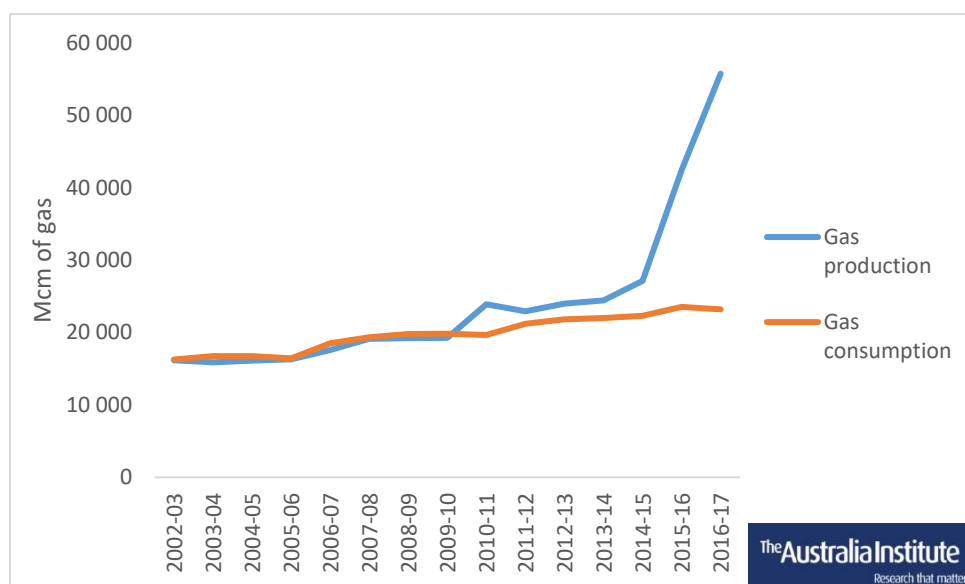
The Government should also encourage switching from gas to renewable energy for electricity generation. Electricity from renewable energy is already far lower cost than gas. Even with the cost of energy storage added, it remains competitive. These measures would also be consistent with Australia’s responsibilities to reduce greenhouse gas emissions to combat climate change.

These measures should be complemented by a cap on LNG exports to prevent gas saved through fuel switching simply being exported by LNG companies, and to increase the supply of gas to the domestic market enough to reduce prices.

# Introduction

There is no shortage of gas in Australia. Australia produces vast amounts of gas. Since 2012, gas production on the east coast of Australia has tripled and is now approximately three times greater than domestic consumption, as shown in Figure 1 below.

**Figure 1: Australian gas production domestic v export**

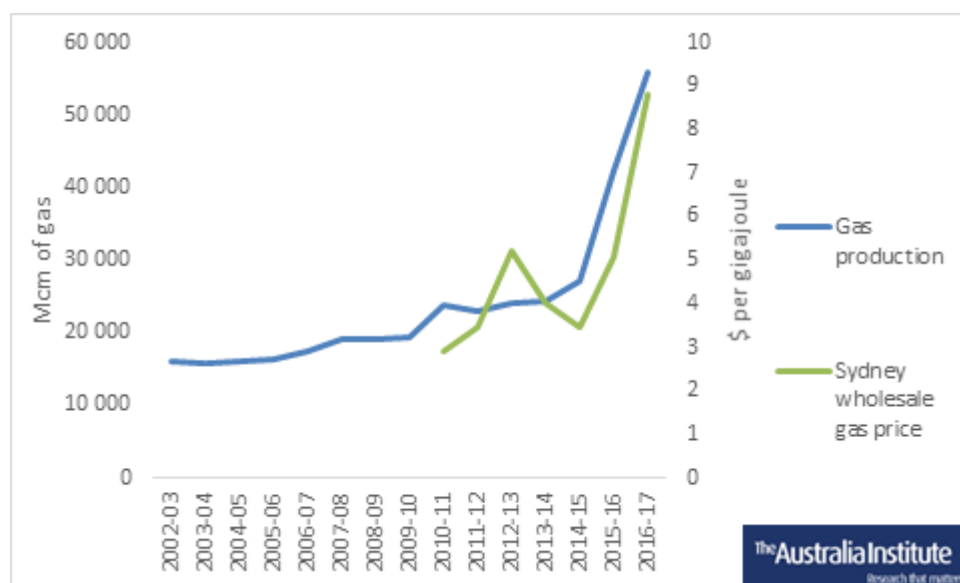


Source: Australia Institute calculations from Department of the Environment and Energy, Australian Energy Statistics, Table Q, August 2018

The increase shown in Figure 1 is one of the largest and fastest expansions of gas production anywhere in the world, ever. Over the same period, demand for gas within Australia has remained relatively flat.

The enormous and rapid increase in supply over the last 5 years has been accompanied by a corresponding increase in gas prices rather than a decrease. Further increasing the amount of gas produced in Australia will not bring down gas prices down because LNG companies can simply export any additional supply. This has been demonstrated beyond any in Figure 2 below:

**Figure 1: Australian gas production v price**



Source: Australia Institute calculations from Department of the Environment and Energy, Australian Energy Statistics, Table Q, August 2018

Prior to the commencement of LNG exports from Queensland in 2014, Australia enjoyed generally below-world market prices for gas. While many commentators, including The Australia Institute, foresaw that gas prices would triple to reach roughly export parity, few expected them to rise beyond that level. However, even when global prices have fallen, at times Australian consumers have had to pay more for Australian gas than overseas buyers.<sup>1</sup>

The reason for this is the market power of gas suppliers in Australia. Buyers in Australia are faced with what is effectively a cartel of gas producers that keep Australian prices high. Buyers in Japan, by contrast, can purchase from any number of gas-exporting countries and companies. The evidence of this is in the various proposals to build gas import terminals in Australia, despite being a major gas exporting country.

The question of what should gas prices be in Australia is a difficult one. Methane is a potent greenhouse gas pre-combustion, and fugitive emissions are inadequately monitored and considered in Australian greenhouse gas inventories. Even when burned gas contributes substantially to climate change.

In this sense, Australians should not be subsidising their own fossil fuel use and contribution to climate change by demanding artificially cheap gas. However, substantial industries have been developed during the cheap gas era, such as manufacturing, transport and electricity. Many households have invested substantial amounts in gas heating. These industries and households need time to adjust to the new reality of higher gas prices.

<sup>1</sup> Macrobusiness (September 2019), Gas prices collapse worldwide...except Australia, <https://www.macrobusiness.com.au/2019/09/gas-prices-collapse-worldwide-except-australia/>

While it is difficult to set a particular price that gas should trade at in Australia, the current situation is clearly unacceptable, with a small group of largely foreign companies imposing the highest price they can, often above world prices. The policy goals should be to reduce the power of these companies. There are two ways this can be achieved.

Firstly, governments need to assist industries and households reduce their reliance on gas by promoting energy efficiency, fuel switching to efficient electrical systems for space and hot water heating, electrification of transport and other sectors.

Secondly, the Australian Government should work to gain influence over gas market prices, rather than leaving market power in the hands of gas companies. This can be achieved by capping exports.

The Federal Government has two main initiatives to address gas price rises, the ACCC Gas Inquiry and the Australian Domestic Gas Security Mechanism (ADGSM). Despite these, gas prices for commercial and industrial customers in the East Coast Gas Market remain around \$10-12/GJ, four times pre-LNG export levels.<sup>2</sup>

The ACCC has undertaken over 2 years of inquiry into “supply of and demand for wholesale gas in Australia” releasing 7 interim reports and well over 1000 pages of analysis. The result to date was summed up by the Chairman of the ACCC Rod Simms admitting that he is none the wiser:

If you want to fix the gas market, you would not start where we are. Any other problem you want to talk about, I can give you a solution. The gas market is really tricky.<sup>3</sup>

While mustering the political will to regulate the gas industry may be tricky, the policy solution to the domestic gas situation is quite simple – a cap on exports. A cap would increase domestic supply, reducing domestic prices.

The Australian Domestic Gas Market Security Mechanism (ADGSM) was introduced in 2017 to “ensure there is a sufficient supply of natural gas to meet the forecast needs of energy users within Australia.” The mechanism enables the Minister to impose export controls on LNG exports if she or he determines that “LNG project’s use of domestic gas” will result in a shortfall in the domestic market.<sup>4</sup>

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<sup>2</sup> ACCC (July 2019) *Gas Inquiry 2017-2022 Interim Report*,  
<https://www.accc.gov.au/system/files/Gas%20inquiry%20July%202019%20interim%20report.pdf>

<sup>3</sup> ABC 7.30 (August 2019) *Transcript: Australia has abundant natural gas, so why is it so expensive?*  
<https://www.abc.net.au/7.30/australia-has-abundant-natural-gas,-so-why-is-it/11432978>

<sup>4</sup> Department of Industry (2019) *Australian Domestic Gas Security Mechanism*,  
<https://www.industry.gov.au/regulations-and-standards/australian-domestic-gas-security-mechanism>

The process of activating the ADGSM and imposing export controls requires the Minister to make an initial determination of a “shortfall year”. To do so, the Minister must issue a notification of their intention to consider making such a determination, and consult with relevant government agencies, other ministers and the LNG industry. At any stage, the LNG industry can offer to supply enough gas to avoid any potential shortfall and avoid triggering the mechanism. The Government describes this process as an “industry led solution”.<sup>5</sup>

If a shortfall year is determined, the Minister then determines the proportion of the shortfall that is attributable to LNG exports and imposes and export controls this amount of gas known as the Total Market Security Obligation (TSMO). The TSMO is then allocated to individual projects on a pro-rata basis depending on the “net-deficit” of the project, i.e. how much domestic gas they have exported. These obligations are known as Exporter Market Security Obligations (EMSO).

The ADGSM has never been used to impose export controls on the LNG industry. In September 2017 following the Minister notifying the LNG industry of his “intention to consider” declaring a gas shortfall year, the LNG industry avoided the ADGSM being activated by promising to supply the absolute minimum amount of gas required to avert a shortfall in the domestic market.

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<sup>5</sup> Australian Government, *Australian Domestic Gas Security Mechanism*  
<https://www.industry.gov.au/regulations-and-standards/australian-domestic-gas-security-mechanism>



# ADGSM entrenches high gas prices

As currently designed, the ADGSM entrenches high gas prices. It allows the LNG industry to increase supply by just enough to avoid a shortfall being perceived by the Minister. At every stage of the process, industry can calibrate the amount of gas released into the domestic market, ensuring supply remains just above the threshold of a “shortfall year”, but never diverting sufficient volumes to significantly reduce prices.

As described in the previous section, the ADGSM can only be triggered if the Minister determines there is likely to be a “shortfall year” based on the advice of the Australian Energy Market Operator (AEMO), the ACCC, the LNG industry and other government agencies.<sup>6</sup>

The initial requirement for the Minister to make a determination of a shortfall year requires the Minister to issue a “notification of intent to consider whether to determine a shortfall year”.

At this point the Minister must seek the LNG industry’s views about proposed LNG exports and the Australian gas market. Once the Minister makes a decision on whether export controls will apply, she or he must then make the decision public and again seek feedback from the LNG industry.

At any point of this process, the LNG industry can decide to supply just enough gas avoid the ADGSM being triggered.

This arrangement guarantees both that the ADGSM cannot be triggered (and export controls imposed) unless the LNG companies choose not to supply the amount of gas necessary to avoid a shortfall.

How this works in practice is clearly illustrated by the example of the only time the Government seriously considered triggering the ADGSM. In September 2017 following an AEMO projection of a potential shortfall of between 54 and 107 PJ in 2018, and 48 to 102 PJ in 2019,<sup>7</sup> the Government announced its intention to consider activating the ADGSM.

Following the notification, the Government negotiated a deal with the three largest LNG companies on the east coast (Origin, Shell and Santos) to supply additional gas and therefore avoid a shortfall. It has been reported that in the agreement the companies

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<sup>6</sup> Australian Government (2017) *Customs (Prohibited Exports) (Operation of the Australian Domestic Gas Security Mechanism) Guidelines* 2017, <https://www.legislation.gov.au/Details/F2017N00050>

<sup>7</sup> AEMO (2017) *Update to Gas Statement of Opportunities*, [https://www.aemo.com.au/-/media/Files/Gas/National\\_Planning\\_and\\_Forecasting/GSOO/2017/2017-Gas-Statement-of-Opportunities---Update.pdf](https://www.aemo.com.au/-/media/Files/Gas/National_Planning_and_Forecasting/GSOO/2017/2017-Gas-Statement-of-Opportunities---Update.pdf)

agreed to sell a minimum of 54 PJ into the east coast domestic gas market (equivalent to the lower limit of the forecast shortfall) and keep more on standby in case the eventual shortfall turned out to be bigger.<sup>8</sup>

In other words, the companies agreed to supply the absolute minimum required to avoid the “shortfall year” trigger that would allow the ADGSM to be activated. This enabled them to retain the maximum possible constraint on supply and therefore the maximum possible domestic price, short of allowing an actual shortfall.

The ADGSM is not designed to reduce gas prices but to avoid a domestic gas shortfall. For example, if the high gas prices forced domestic gas reliant industries to leave the country and hence reduce domestic demand for gas, this would not ‘free up’ gas for other domestic consumers and put downward pressure on prices. Rather the amount of gas required to avoid a shortfall would be reduced and the gas industry would direct more gas for export. If the Government or parliament wants to reduce gas prices it will need to implement further mechanisms, beyond the ADGSM, to achieve this.

It is important to note that the potential shortfall identified by AEMO was not due to an actual shortage of gas produced for the domestic market. It was the result of LNG companies underestimating the productivity of their Queensland CSG tenements. Their underestimation meant they were forced to buy or redirect gas from fields that have traditionally supplied the domestic market and use this gas to meet export contracts. Credit Suisse estimates that the Santos-led GLNG project purchased 160PJ out of the domestic market to export as LNG in 2016, equivalent to 27% of domestic consumption.<sup>9</sup>

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<sup>8</sup> Hepburn (October 2017) *The government’s new gas deal will ease the squeeze, but dodges the price issue*, <http://theconversation.com/the-governments-new-gas-deal-will-ease-the-squeeze-but-dodges-the-price-issue-85175>

<sup>9</sup> Robertson (2019), *Towards a Domestic Gas Reservation in Australia*, [http://ieefa.org/wp-content/uploads/2019/07/Towards-a-Domestic-Gas-Reserve\\_9-July-2019.pdf](http://ieefa.org/wp-content/uploads/2019/07/Towards-a-Domestic-Gas-Reserve_9-July-2019.pdf), Samter et al (2017) *Australian East Coast Gas: The Ass, the Cock and the Lion*, [https://research-doc.credit-suisse.com/docView?language=ENG&format=PDF&sourceid=csplusresearchcp&document\\_id=1071888041&serialid=eEJviFWICRzuHdkLE27aurRlpz4UiGfPB0ewbZzvGQI%3d](https://research-doc.credit-suisse.com/docView?language=ENG&format=PDF&sourceid=csplusresearchcp&document_id=1071888041&serialid=eEJviFWICRzuHdkLE27aurRlpz4UiGfPB0ewbZzvGQI%3d)

# The solution: Reducing gas dependency and a cap on gas exports

## REDUCING GAS DEPENDENCY THROUGH FUEL SWITCHING AND EFFICIENCY

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The best way to reduce the negative impacts of high gas prices is to reduce Australia's gas dependency by efficiency and fuel switching measures.

This is important firstly to reduce the exposure of Australian households and businesses to high gas prices. Secondly, gas that is saved in the residential and gas powered generation sectors can be made available to industrial users where reducing gas use is more challenging.

It is already far cheaper (including the cost of installation and energy use over 10 years) for new houses to install new efficient electrical systems to provide heating, cooling, hot water and cooking than connecting to the gas network.<sup>10</sup>

It is also cheaper in all locations in Australia for existing houses to replace hot water systems or gas heaters at the end of their life with new efficient electrical systems than gas.<sup>11</sup>

In Victoria, gas use is dominated by residential and commercial use making up 122 PJ in 2018, over 20% of Australia's entire domestic gas consumption. This is predominantly space and water heating.<sup>12</sup>

This provides enormous opportunities to reduce the exposure of Australian households and businesses to volatile gas prices, but also to save gas from the residential sector and commercial sectors to redirect to industrial uses where efficiency and fuel switching are more difficult and expensive.

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<sup>10</sup> ATA (2018), *Australian Domestic Gas Security Mechanism*, [https://renew.org.au/wp-content/uploads/2018/08/Household\\_fuel\\_choice\\_in\\_the\\_NEM\\_Revised\\_June\\_2018.pdf](https://renew.org.au/wp-content/uploads/2018/08/Household_fuel_choice_in_the_NEM_Revised_June_2018.pdf)

<sup>11</sup> ATA (2018) Ibid.

<sup>12</sup> AEMO (2019) *GSOO 2019*, [https://www.aemo.com.au/-/media/Files/Gas/National\\_Planning\\_and\\_Forecasting/GSOO/2019/2019-GSOO-report.pdf](https://www.aemo.com.au/-/media/Files/Gas/National_Planning_and_Forecasting/GSOO/2019/2019-GSOO-report.pdf)

Similarly, solar and wind are now considerably cheaper than gas for electricity generation, and competitive even when the cost of firming power is added.<sup>13</sup> Again, switching to renewable energy and storage reduces electricity prices and can potentially save significant amounts of gas for industrial uses.

## EXPORT CAP

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While reducing gas dependence is an essential first step towards solving the problem of a high energy prices, a cap on exports is also necessary, otherwise gas that is saved through fuel switching and energy efficiency can be exported by LNG companies rather than kept in the domestic market.

A simple cap on LNG exports would ensure sufficient supply and bring down prices to Australian customers. It would eliminate the opportunities for the LNG industry to constrain domestic supply and drive up prices.

Given some LNG projects underestimated their productivity and have exported large quantities of gas that were developed for the domestic market, particularly from Bass Strait and the Cooper/Eromanga Basin, the cap could reflect this deficit and provide additional gas for the domestic market.

The volume of the cap could be determined with regard to the domestic gas price that the Government determines is appropriate. Once the price is determined, the volume of the cap can be set to allow sufficient supply to achieve the target price. The cap could be periodically reviewed and adjusted if it does not achieve the target price.

In determining the appropriate domestic gas target price, the Government should take environmental considerations into account. As noted above, Australians should not be subsidising their own fossil fuel use and contribution to climate change by demanding artificially cheap gas. However, combined with the measures outlined above to reduce gas use, a cap recognises that substantial industries have been developed during the cheap gas era, such as manufacturing, transport and electricity. Many households have invested substantial amounts in gas heating. These industries and households need time to adjust to the new reality of higher gas prices.

The LNG industry often argues that any assertion of control over our natural resources undermines further investment by the industry.

Australia has a record of allowing global oil and gas companies to exploit and export our natural resources without sufficient attention to impacts on other sectors of the Australian economy. Approving effectively unlimited export capacity from Gladstone for instance

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<sup>13</sup> CSIRO/AEMO (2018), *GenCost 2018*, <https://www.csiro.au/en/News/News-releases/2018/Annual-update-finds-renewables-are-cheapest-new-build-power>

resulted in an entirely foreseeable (and foreseen) increase in gas prices though linkage to global prices. It has been estimated that this decision created a windfall gain of \$81 billion for the gas industry at the expense of a \$114 billion impact to the Australian manufacturing industry.<sup>14</sup>

An export cap is an entirely reasonable assertion of Australia's sovereignty over our natural resources. As noted above, countries such as Norway, Saudi Arabia and Malaysia derive far greater revenues and generally enjoy lower domestic prices than Australia, yet they have no problem attracting investment in their oil and gas industries.

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<sup>14</sup> Deloitte Access Economics (2014), *Gas market transformations– Economic consequences for the manufacturing sector*, Table i, P.3  
<https://www2.deloitte.com/content/dam/Deloitte/au/Documents/finance/deloitte-au-fas-gas-market-transformations-july-2014-240914.pdf>

# Response to Terms of Reference

1. The effectiveness and efficiency of the ADGSM in ensuring a sufficient supply of natural gas for Australian consumers with minimum disruption to Australia's liquefied natural gas export industry;

Response: Because the ADGSM allows gas companies to calibrate the supply of gas to the minimum amount to avoid the trigger of a "shortfall year", it ensures supply will remain as constrained as possible, short of causing an actual shortfall, and therefore keeping prices to Australian consumers as high as possible. The only effect it could have on LNG exports is to marginally reduce the export of gas developed for the domestic market from Bass Strait and the Cooper Eromanga basin. The ADGSM is not designed to reduce gas prices in any material way and it is not having this effect

2. The impact of the ADGSM on the competitiveness of Australia's liquefied natural gas export industry, Australia's investment reputation and Australia's international reputation for quality and reliability;

Response: The ADGSM is so favourable to LNG exporters that it has almost no impact on their operations. Countries such as Norway, Saudi Arabia and Malaysia derive far greater tax revenues and generally enjoy lower domestic prices than Australia, yet they have no problem maintaining the 'competitiveness' of their oil and gas industries.

3. The impact of the ADGSM on the Australian domestic gas market, including the development of new and additional gas resources and market functions;

Response: The main impact of the ADGSM on the domestic gas market is to entrench high gas prices. It does this by enabling LNG exporters to calibrate supply to the minimum amount required to avoid an actual domestic shortage, thus maintaining the greatest possible upward pressure on domestic prices.

Increasing the amount of gas produced in Australia would have no effect on domestic prices as demonstrated by the tripling of domestic gas prices to date over the same period of a tripling of production (see Figure 2 above). Any amount of additional gas produced can simply be exported. Only an export cap can solve this problem.

4. Whether improvements can be made to the operation of the ADGSM and whether there are appropriate alternative mechanisms to achieve the objectives of the ADGSM;

Recommendation: As outlined above, the best way to reduce the negative impacts of high gas prices is to reduce the exposure of Australian households and businesses to the gas

market. Promoting energy efficiency and fuel switching measures could substantially reduce this exposure. As discussed above, there are already many lower cost alternatives to gas.

Reducing gas use is also consistent with Australia's responsibility to reduce greenhouse gases in line with our international commitments.

These measures should be complemented by a cap on LNG exports to ensure that gas saved through efficiency and fuel-switching measures is not simply exported by LNG companies, and that the overall supply of gas to domestic customers is increased putting downward pressure on prices.

5. Whether the ADGSM should be amended or repealed before 1 January 2023 and the timing of any such amendment or repeal; and

Recommendation: The ADGSM should be repealed as soon as an export cap is in place.

# Conclusion

The ADGSM is effective in compelling LNG exporters to supply just enough gas to avoid an actual shortage, however it also effectively entrenches high gas prices for Australian customers.

Its “industry led solution” design allows LNG exporters to supply to a minimum amount of gas to avoid a shortage, but little enough to ensure prices remain high.

The only real solution to the problem of high gas prices is to reduce the dependency on gas of Australian households through fuel switching and energy efficiency. There are huge opportunities to achieve this because for many uses, particularly space and hot water heating, and gas-powered generation there are already cheaper electrical and renewable alternatives.

This should be complemented by a cap on exports which is a direct, simple and effective way ensure supply and bring down prices to a level the government considers acceptable. It could also ensure that gas saved through efficiency and fuel switching in the domestic market remains in the domestic market, rather than being exported by LNG companies.



# MINING THE AGE OF ENTITLEMENT

STATE GOVERNMENT ASSISTANCE TO  
THE MINERALS & FOSSIL FUEL SECTOR



JUNE 2014

MICK PEEL,  
RODERICK CAMPBELL  
& RICHARD DENNISS

The Australia Institute

Research that matters.

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# Mining the age of entitlement

State government assistance to the minerals and fossil fuel sector

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Mick Peel, Roderick Campbell and Richard Denniss

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Level 5, City Walk Centre  
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Tel +61 2 6130 0530  
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## Summary

State governments are more usually associated with the provision of health, education and law enforcement than industry assistance. So it might surprise taxpayers to learn that state government assistance for the mineral and fossil fuel industries consumes significant amounts of their money.

Each state provides millions of dollars' worth of assistance to mining industries every year, with the big mining states of Queensland and Western Australia routinely spending over one billion dollars in assistance.

This paper is the first attempt to put a dollar figure on the value of state assistance to the mining industry. It shows that over a six-year period, state governments in Australia spent \$17.6 billion supporting the mineral and fossil fuel industries. Queensland's assistance was by far the largest of all states, totalling \$9.5 billion, followed by Western Australia's at \$6.2 billion.

State government assistance to the mineral and fossil fuel industries appears substantial even when compared to big budget items, such as health, education and law and order. For example, Queensland's expenditure on these industries in 2013-14 is similar to the amount to be spent on disability services and capital expenditure on hospitals. Queensland will spend as much on supporting the mining industry as it does on supporting some of its most vulnerable citizens. Similarly, industry assistance in Western Australia is substantial when compared to police and health, and in New South Wales, it is comparable to other important budget items such as managing the state's national parks and providing accommodation for those with disabilities.

Supporters of Australia's mineral and fossil fuel industries are quick to argue that royalties paid to state governments demonstrate those industries' value and importance. Rarely, however, are these contributions compared with industry assistance. State expenditure on industry assistance makes up a significant proportion of what states receive through royalties, particularly in the big mining states of Queensland and Western Australia. In 2013-14 Queensland is planning on spending \$1.5 billion on industry assistance, almost 60 per cent of what it will receive in royalties.

Mining the state budgets for details on state subsidies to the mineral and fossil fuels industry was a lengthy process. It is not surprising, then, that the scale of state subsidies to some of Australia's biggest, most profitable industries has thus far remained unearthed. This paper details the value of state revenue that would otherwise have been available for increased vital public services – for example, more teachers, nurses and police.

## Introduction

*We are in the coal business. If you want decent hospitals, schools and police on the beat we all need to understand that.* Campbell Newman.<sup>1</sup>

*[Mining royalties] help to put teachers in classrooms, police officers on in our communities and nurses in our hospital wards; by doing their jobs, New South Wales miners are helping some of the most important people in our community to do theirs.* NSW Minerals Council.<sup>2</sup>

Supporters of the minerals and fossil fuel industries, like Queensland Premier Campbell Newman and the New South Wales Minerals Council, regularly emphasise the money that these industries pay to state governments. Much less is said about the money that state governments pay to assist these industries.

State government assistance to the minerals and fossil fuel industries is considerable. Based on an analysis of state government budget papers, we estimate that a total of almost \$18 billion has been contributed by the taxpayer over the last six budgets.

This assistance takes many forms. Sometimes it is a direct cash payment. For example, the New South Wales government gave multinational coal companies \$10 million in 2009 as an ‘assistance package’. Other times it comes in the form of discounted access to services provided by the state and its businesses – Queensland has provided the coal industry with ‘concessions’ on access to rail services worth over \$1 billion between 2012-13 and 2013-14.

Often assistance comes in the form of infrastructure or projects that wholly or partly benefit the minerals and fossil fuel industries. Sometimes this expenditure brings a financial return, as in the case of Western Australia’s hundreds of millions of dollars spent on developing port infrastructure. Sometimes it doesn’t – the New South Wales government is unlikely to see any return on its \$76 million expenditure on the Cobbora Coal project.

The aim of this report is to estimate the extent of state government spending on the minerals and fossil fuel industries. While estimates of federal assistance to these industries have been made, no similar research exists for state or local government expenditure.

At the federal level, The Australia Institute publishes an annual study on subsidies of the mining industry, which totalled \$4.5 billion in 2013, up from \$4.0 billion in 2012.<sup>3</sup> Other organisations publish estimates of subsidies provided to fossil fuel use and production, which also focus largely on assistance at a federal level.<sup>4</sup> While many of these publications note the existence and likely scale of state government spending, no estimates have been made.

The main reason for the lack of research quantifying state government spending on the minerals and fossil fuel industries is likely to be the difficulty in extracting relevant spending

<sup>1</sup> News.com.au (2012) ‘*Wer’e in the coal business*’: Campbell newman slams UNESCO Great Barrier Reef warning

<sup>2</sup> NSW Mining (2013) *Helping put teachers in classrooms & nurses in hospitals*

<sup>3</sup> Grudnoff M (2012) *Pouring fuel on the fire: The nature and extent of federal government subsidies to the mining industry*; Grudnoff M (2013) *Pouring more fuel on the fire: The nature and extent of federal government subsidies by the mining industry*.

<sup>4</sup> ACF (2011) *Drill now, pay later: The growing cost of tax breaks for the oil and gas industry in Australia*; Environment Victoria and Market Forces (2013) *Ending the fossil fuel industry’s age of entitlement: An analysis of Australian Government tax measures that encourage fossil fuel use and more pollution*; IMF (2013) *Energy subsidy reform : Lessons and implications*. An exception to this is OECD (2013) *Australia: Inventory of Estimated Budgetary Support and tax Expenditures for Fossil Fuels* which does include some state and territory level analysis, but is not comprehensive.

data from state government sources compared to federal sources. Federal-level sources often present data broken down by industry category, or relate to well-known subsidies such as fuel rebates or fringe benefits tax concessions. State government spending, by contrast, relates to a large range of assistance programs, capital projects and government-owned businesses. Identifying the relevant items is much more labour-intensive. A detailed methodology is provided in Appendix A.

Our estimates are based on the state government budget papers, published by state treasuries each year. Budget papers outline state governments' planned and actual spending on items such as direct payments to industry, favourable tax treatment and infrastructure provision. Relevant items have been identified and categorised in terms of the nature and extent of the assistance provided.

Unlike federal government assistance, much state government spending is on provision of capital assets operated by state-owned enterprises. Some of these assets and enterprises earn a return for the taxpayer at the same time as providing some degree of assistance to the minerals and fossil fuel industries.

This report does not present arguments for or against involvement by state governments in various industries, nor for or against asset sales. All these issues should be considered on their merits by carefully examining the costs and benefits of government expenditure and assistance for industries. We do not estimate the 'net costs' or 'net benefits' to the taxpayer of each of these items – we focus on the spending on such assets and enterprises. This spending reduces the capacity of state governments to spend on other areas such as provision of health, education and transport infrastructure.

As an example, the Queensland government was pleased to sell parts of its rail assets for \$4.6 billion in 2010. While there is debate about the price received and the overall merit of privatising these assets, there is little discussion of the \$3 billion dollars that taxpayers spent on those assets leading up to their sale. That \$3 billion could have been spent on schools or hospitals, which also generate an economic return for Queensland.

Assistance to mineral and fossil fuel industries from local governments is not considered in this report. Local governments are often responsible for funding maintenance of the infrastructure used by these industries. Where these industries are placing an additional cost on this infrastructure without contributing to its maintenance, this constitutes assistance to these industries. An example is the upgrade of the Ulan Road in New South Wales, where coal industry expansion has driven the need for increased maintenance. This cost has fallen largely on local governments – in this case, until pressure from local activists resulted in renegotiation of funding arrangements.<sup>5</sup>

This report provides the first comprehensive attempt to quantify state government assistance to the mineral and fossil fuel industries. The various forms this assistance takes makes the task difficult, particularly because public statements from advocates for the minerals and fossil fuel industries, such as those quoted above, focus exclusively on the benefits they provide and forget to mention that state governments incur significant costs in assisting these industries. These costs are considerable, as our investigation shows.

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<sup>5</sup> Validakis V (2013) *Funding plan for Ulan Road slammed by local council*; Stanford L (2013) *\$9.5 million for Ulan Road*

## Value of state subsidies

The magnitude of the total value of state government support for the mineral and fossil fuel industries will surprise many Australians.

Table 1 summarises the total state government support for the minerals and fossil fuel industries identified from the state budget papers. It shows that in the six years from 2008-09 to 2013-14 state governments in Australia spent \$17.6 billion on direct support to these industries.

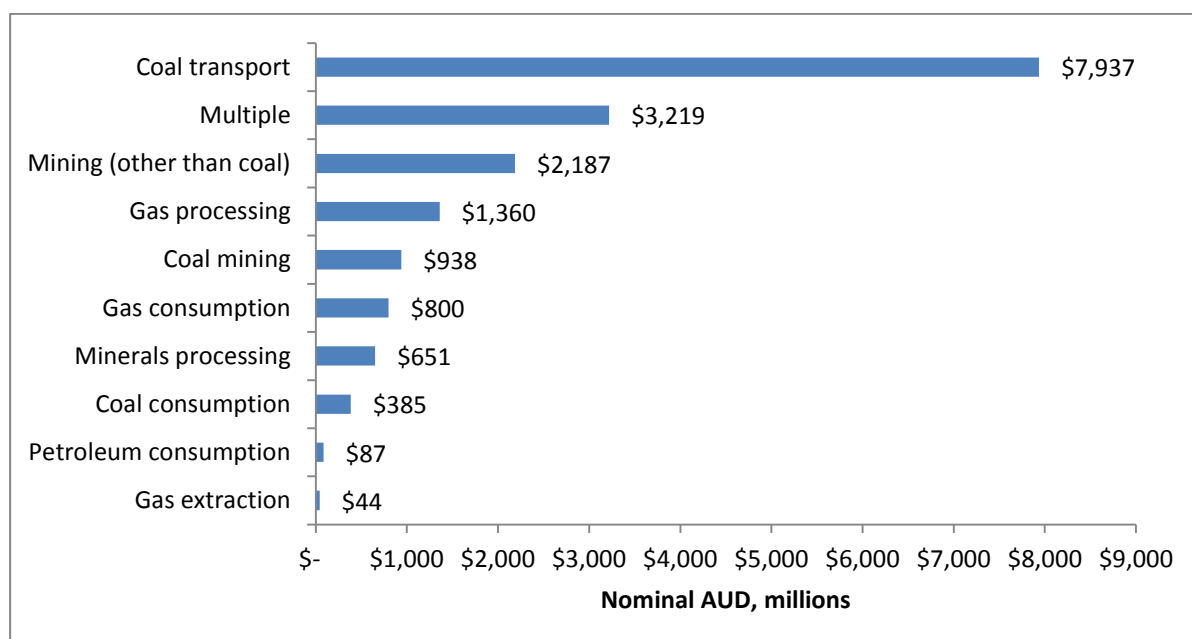
**Table 1: State budget minerals and fossil fuel expenditures and concessions by state and year (\$ million)**

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Total
Queensland	2,932.7	1,525.8	1,362.9	831.1	1,398.9	1,489.6	9,541.1
Western Australia	1,011.8	1,140.6	831.4	890.9	949.5	1,391.4	6,215.5
New South Wales	235.3	166.1	97.6	157.3	80.1	136.4	872.8
Northern Territory	54.1	75.0	60.5	67.4	62.0	87.6	406.7
South Australia	20.0	35.6	44.4	65.1	80.6	70.6	316.2
Victoria	22.0	31.6	35.3	38.9	42.5	35.5	205.7
Tasmania	5.1	4.5	7.1	10.8	9.3	17.3	54.1
<b>Total</b>	<b>4,281.2</b>	<b>2,979.2</b>	<b>2,439.2</b>	<b>2,061.5</b>	<b>2,622.8</b>	<b>3,228.3</b>	<b>17,612.1</b>

Source: State and Territory Budget Papers.

## Spread of subsidies by industry segment

The most heavily assisted industry segment was the coal transport sector, which received nearly \$8 billion worth of expenditure, as shown in Figure 1 below:

**Figure 1: Total spending by industry segment**

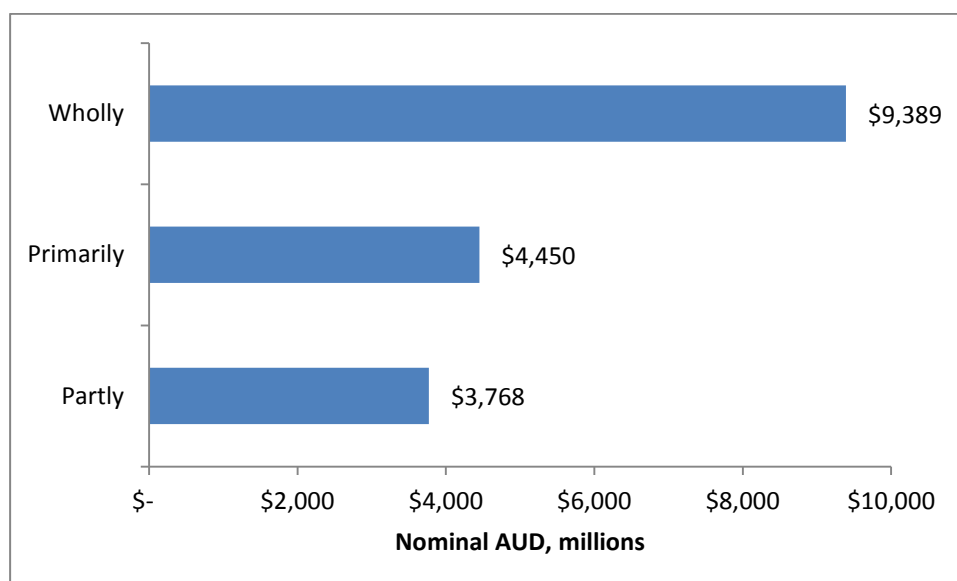
Note: Totals do not add to those in Table 1 due to rounding.

The vast bulk of coal transport expenditure and concessions came from Queensland – more than \$7.6 billion – with some \$333 million in New South Wales. Expenditure that benefited multiple categories was largely found in Western Australia, due to the prevalence of common infrastructure used by both the mining and gas industry segments, particularly ports. Mining (other than coal) expenditure came mainly from WA, which spent \$1.4 billion over the 2008-09 to 2013-14 period. South Australia also accounted for \$274 million of assistance to mining (other than coal) – the bulk of its contribution to minerals and fossil fuel industries. Gas processing expenditure was centred on Western Australia, which spent \$743 million, although the Northern Territory also contributed to this, funding a total of \$359 million, the majority of its industry assistance.

Assistance to the minerals processing sector was worth just over \$1 billion over the assessment period. Queensland and WA spent over \$100 million on assistance to minerals processing industries, largely through infrastructure provision. Tasmania's \$17 million expenditure on minerals processing accounts for a substantial part of its identified assistance to minerals and fossil fuel industries. Coal mining assistance is centred in the major coal mining states of Queensland (\$561 million) and New South Wales (\$204 million). Gas consumption assistance is largest in Western Australia (\$625 million), relating mainly to gas-fired electricity generation. Queensland also spent \$177 million on items categorised as relating to gas consumption.

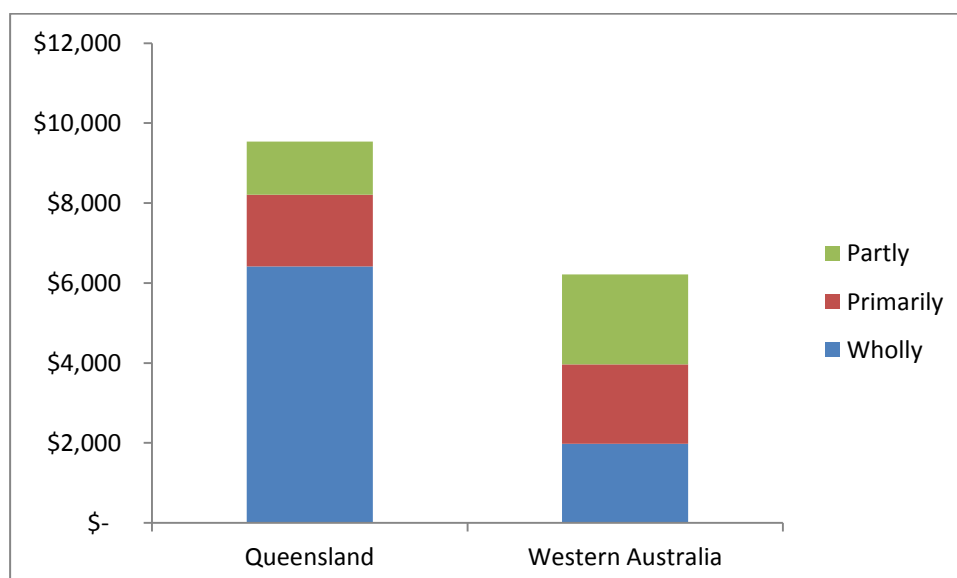
Most items identified as benefiting the minerals and fossil fuel industries were categorised as being wholly dedicated to these industries. Smaller sums were categorised as being primarily for minerals and fossil fuel industries, but with some benefits for other stakeholders, or being just partly for the benefit of these industries, as shown in Figure 2 below:



**Figure 2: Expenditure by level of dedication to minerals and fossil fuel industries**

Note: totals do not add to those in Table 1 due to rounding.

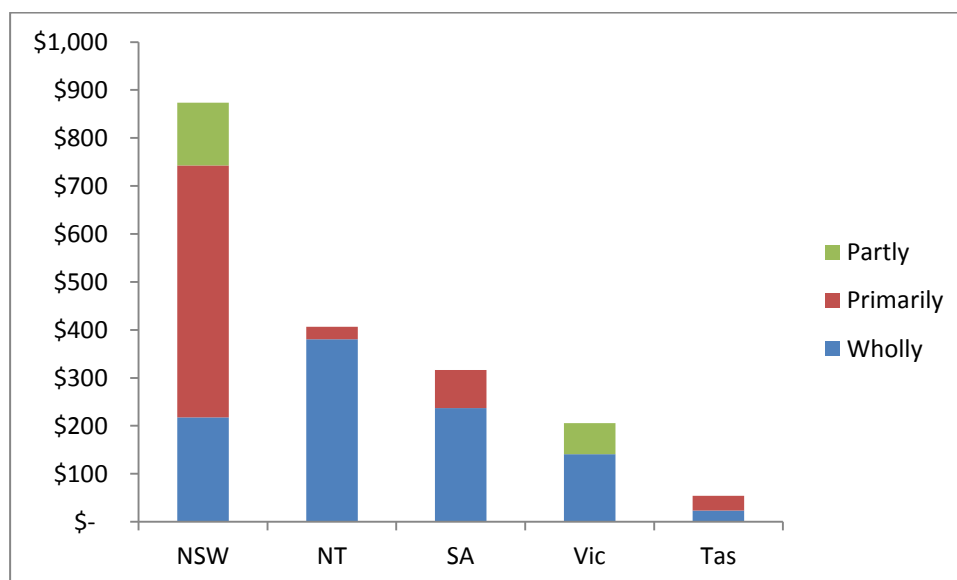
A total of \$6.4 billion dollars of wholly dedicated expenditure came from Queensland and \$2.0 billion from Western Australia. Primarily dedicated expenditure also comes mainly from Western Australia – \$2.0 billion – and Queensland, \$1.8 billion. This represents 32 per cent of Western Australia expenditure, but only 19 per cent of Queensland's. Partly dedicated expenditure similarly has the largest sums from Western Australia, \$2.2 billion and Queensland, \$1.3 billion. This represents 36 per cent of Western Australia's expenditure on these industries and only 14 per cent of Queensland's, as shown in Figure 3 below:

**Figure 3: Levels of industry dedication: Queensland and Western Australia**

This demonstrates that the major expenditure in Queensland is on rail infrastructure wholly dedicated to the coal industry, while Western Australia's expenditure is largely on ports and roads, which service a more diverse range of stakeholders.

In New South Wales, 60 per cent of expenditure is on items primarily dedicated to the minerals and fossil fuel industries. This is a high percentage relative to other states, and reflects the categorisation of major port infrastructure as primarily rather than wholly, due to small levels of agricultural shipping at the major coal port, Newcastle. This is the major feature of Figure 4 below:

**Figure 4: Levels of industry dedication: Other states**



No expenditure in the Northern Territory, South Australia or Tasmania was categorised as only *partly* attributable to minerals and fossil fuel industries. Victoria had no expenditure categorised as *primarily* dedicated to these industries, but 32 per cent considered *partly* attributable. This reflects investment in water infrastructure, which partly benefits long-established coal mining and coal-fired power generation operations.

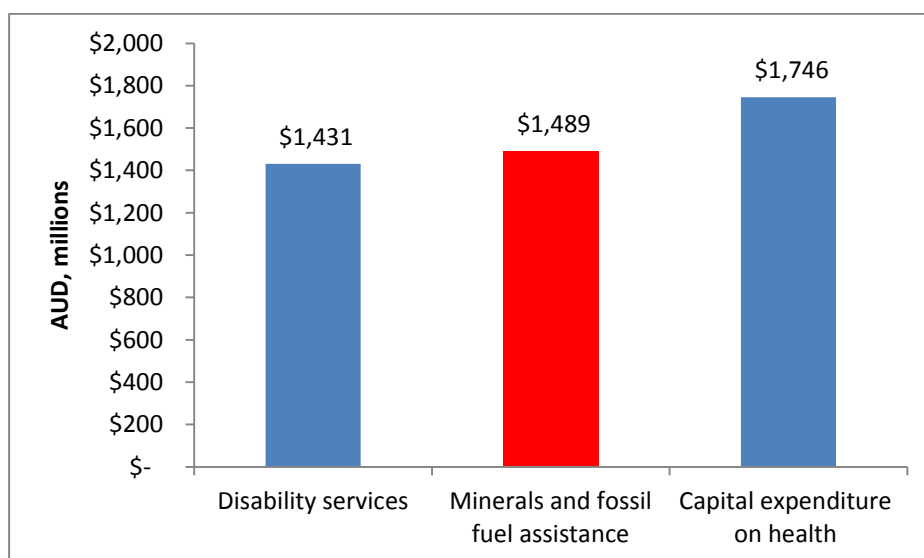
In the following sections these results are further analysed and discussed by state and by the nature of the assistance.

## Which states subsidise the most

Assistance for the minerals and fossil fuel industries represents significant amounts of money for state governments. As the quotes from Queensland Premier Campbell Newman and the New South Wales Minerals Council in our introduction indicate, state governments are more usually associated with provision of health, education and law and order services than with industry assistance. In this section we examine the levels of assistance shown to these sectors in each state in comparison with other items in the budget papers. This comparison places our findings in the wider context of state government finances.

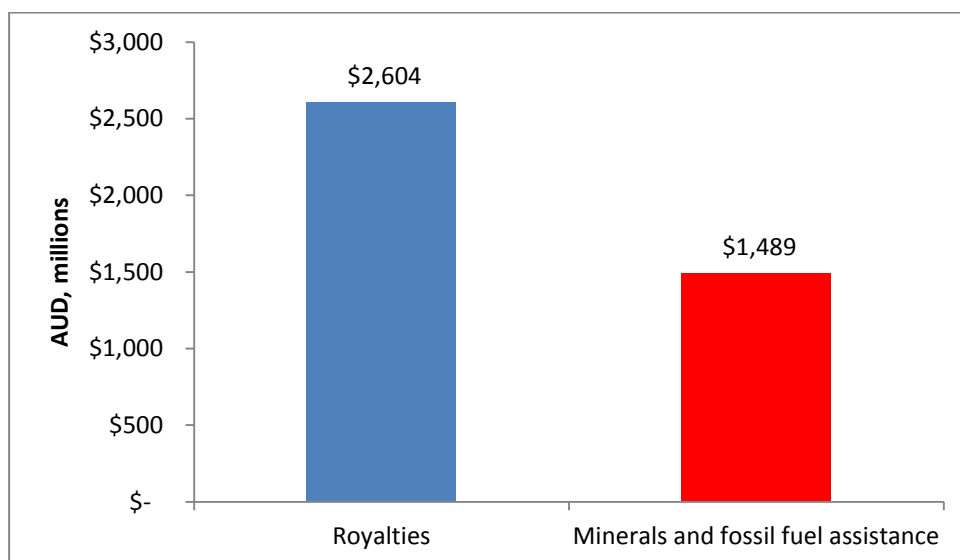
### Queensland

Queensland was, consistently, the state that provided the most assistance to the mineral and fossil fuel industries through the period of analysis. Its expenditure on these industries budgeted for 2013-14 compares to amounts budgeted for disability services and for capital expenditure on hospitals, as shown in Figure 5 below:

**Figure 5: Queensland 2013-14 budget, minerals and fossil fuel assistance in context**

Sources: Queensland Budget Papers 2013-14, Budget Paper 5, p4, Queensland Budget Papers 2013-14, Budget Paper 3, ch3, p73.

Another way to consider the size of assistance to the minerals and fossil fuel industries is in comparison with the royalties that they pay to state governments. In 2013-14 the Queensland government is budgeting to spend \$1,489 million on industry assistance. This is almost 60 per cent of the \$2,604 they are anticipating receiving in royalties, as shown in Figure 6 below:

**Figure 6: Queensland 2013-14 budget, minerals and fossil fuel assistance and royalties**

Source: Queensland Budget Papers 2013-14, Budget Paper 2, ch 3, p72.

The comparison with royalty levels shows that mineral and fossil fuel industry assistance is substantial compared to the most direct benefits that those industries pay back to the Queensland government. The two sums are not directly equivalent as industry costs and benefits and one cannot be subtracted from the other to produce a net benefit calculation.

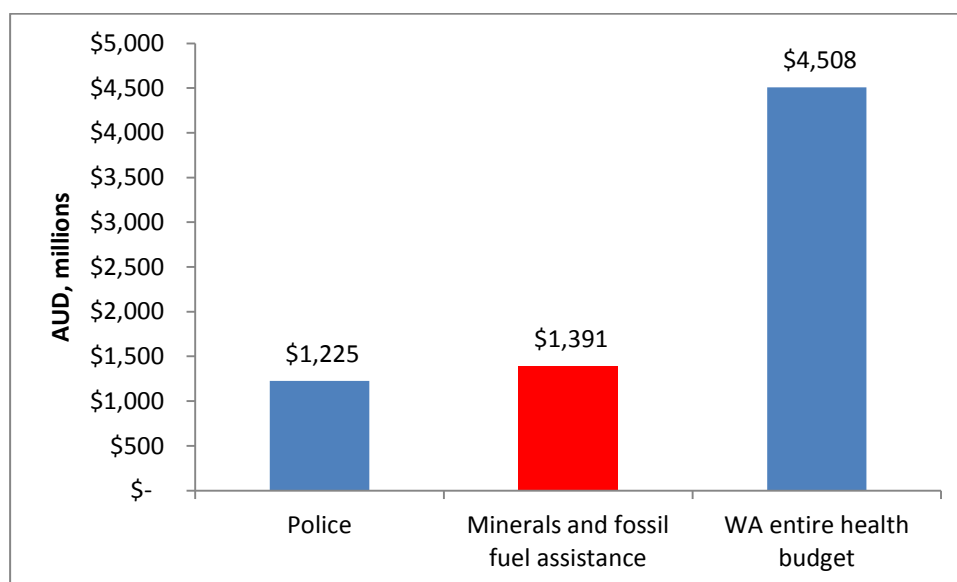
Royalties alone do not account for a range of other payments that would be required for such a calculation and assistance includes items that would need investigation beyond the scope of this report for inclusion in formal cost-benefit analysis. These data are provided for context only, and this should be taken into account for each of the state assessments that follow.

The comparison is made here to make the point that the Queensland government spends a large amount on the minerals and fossil fuel industries even when compared to royalties – the most easily assessed measure of the benefits it derives from these industries.

## Western Australia

WA has the largest minerals and fossil fuel industry, along with a smaller population than the eastern states. With a large industry and a smaller population to service, the assistance paid to these industries is substantial even when compared to some of the major budget items such as police and health, as shown in Figure 7 below:

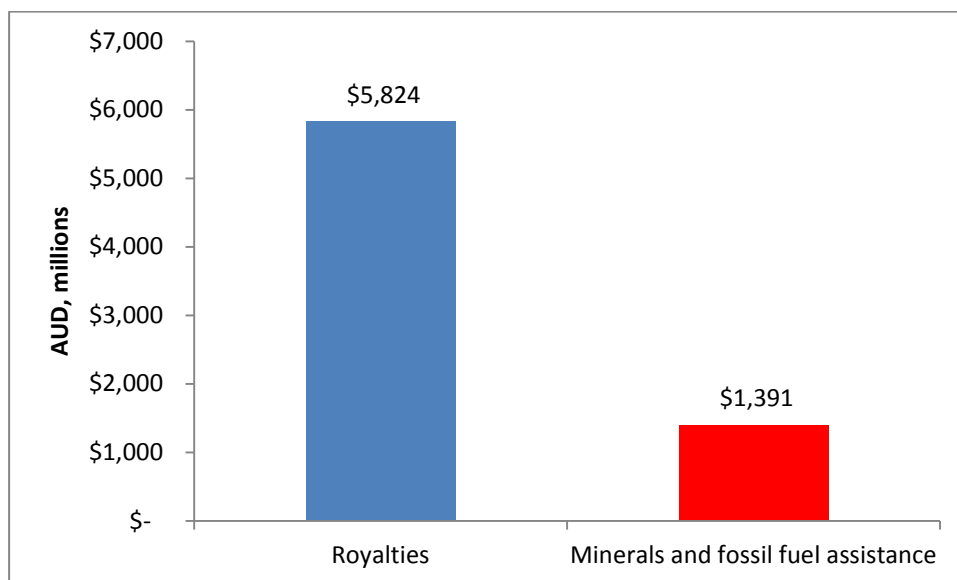
**Figure 7: West Australian 2013-14 budget, minerals and fossil fuel assistance in context**



Sources: WA Budget Papers 2013-14, Budget Paper 2, Ch 3, vol 1, p17 and p5.

As Western Australia has a large resource sector and relatively small government, royalties make up a greater proportion of government revenue in Western Australia than any other state. Royalties of \$5.8 billion will make up 14 per cent of the state's \$42 billion dollar budget. Even compared to this, however, assistance to the minerals and fossil fuel sector is substantial compared to royalties, as shown in Figure 8 below:

**Figure 8: West Australian 2013-14 budget, minerals and fossil fuel assistance and royalties**

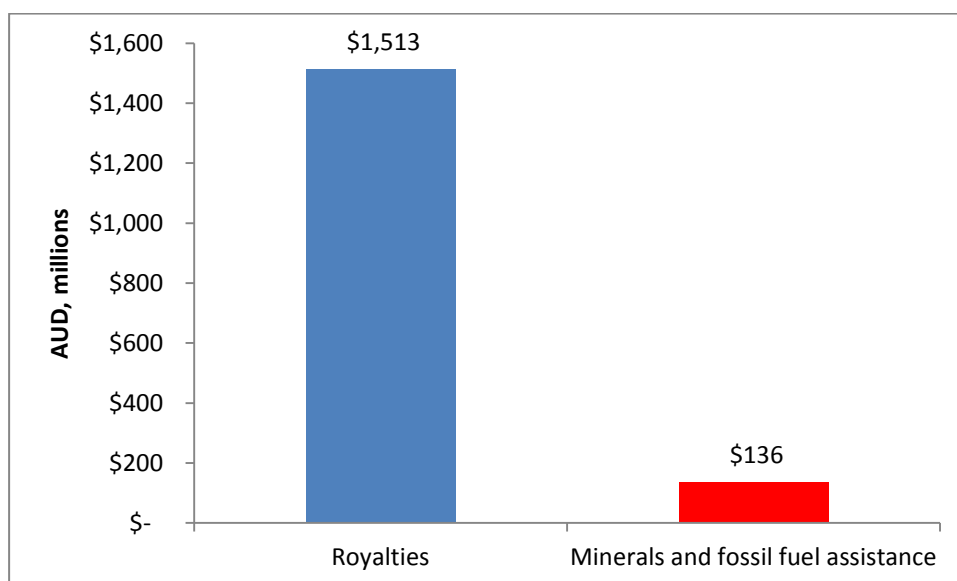


Source: WA Budget Papers 2013-14, Budget Paper 3, Table 14 Royalty Income, p107

## New South Wales

With a much larger population, the context of New South Wales' budgeted \$136 million assistance for these industries is quite different. In New South Wales, royalties are a relatively insignificant source of income for the government, making up only two per cent of revenue. As its mineral and fossil fuel industries are generally well established, assistance to them is small in comparison to royalty income, as shown in Figure 9 below:

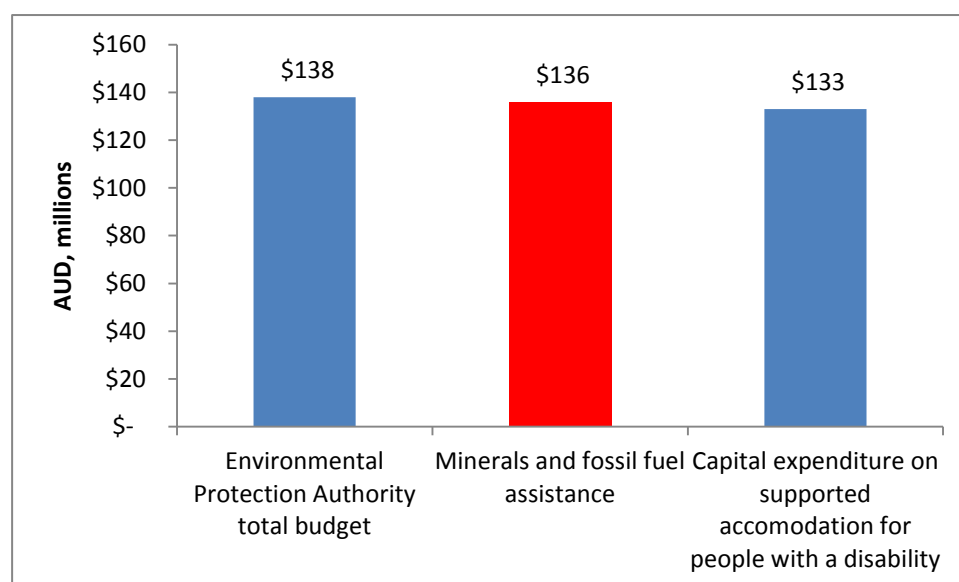
**Figure 9: New South Wales 2013-14 budget, minerals and fossil fuel assistance and royalties**



Source: NSW Treasury (2013) *NSW Budget Papers 2013-14, Chapter 6, General Government Revenue*

With the much larger population and services it entails, minerals and fossil fuel industry assistance is far smaller than the entire health budget, unlike Western Australia, discussed above. Industry assistance is, however, comparable to other important items of the state government budget – such as the state’s Environmental Protection Authority and capital expenditure on supported accommodation for people with disabilities, as shown in Figure 10 below:

**Figure 10: New South Wales 2013-14 budget, minerals and fossil fuel assistance in context**

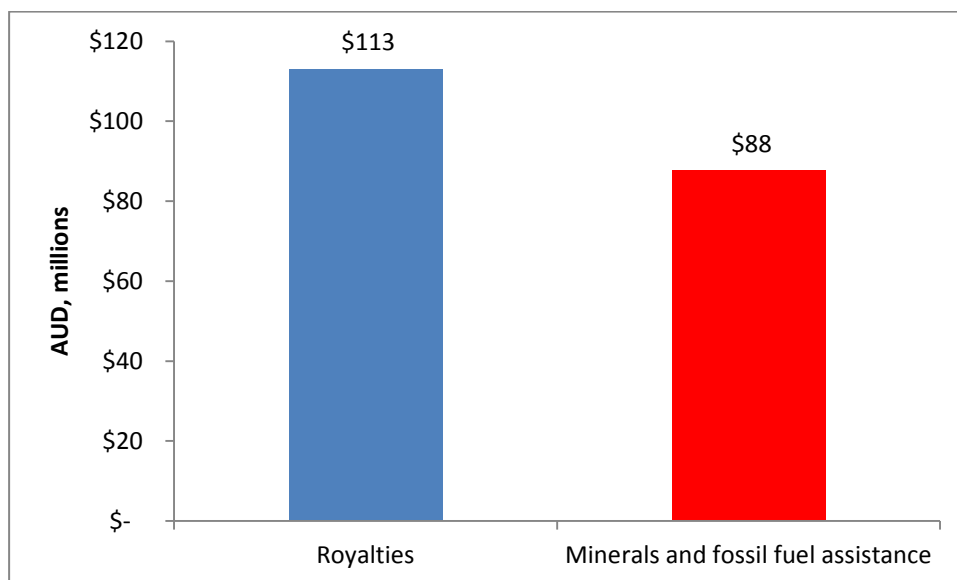


Sources: NSW Budget Papers 2013-14, Budget Paper 3, Ch 4, p4-8, Budget Paper 3, Ch 7, p7-24

## Northern Territory

Like Western Australia, the Northern Territory has a small population and a relatively large minerals and fossil fuel sector. With industry assistance at higher levels, through capital investment in ports for gas exports, this assistance is almost 80 per cent as large as royalty revenue, as shown in Figure 11 below:

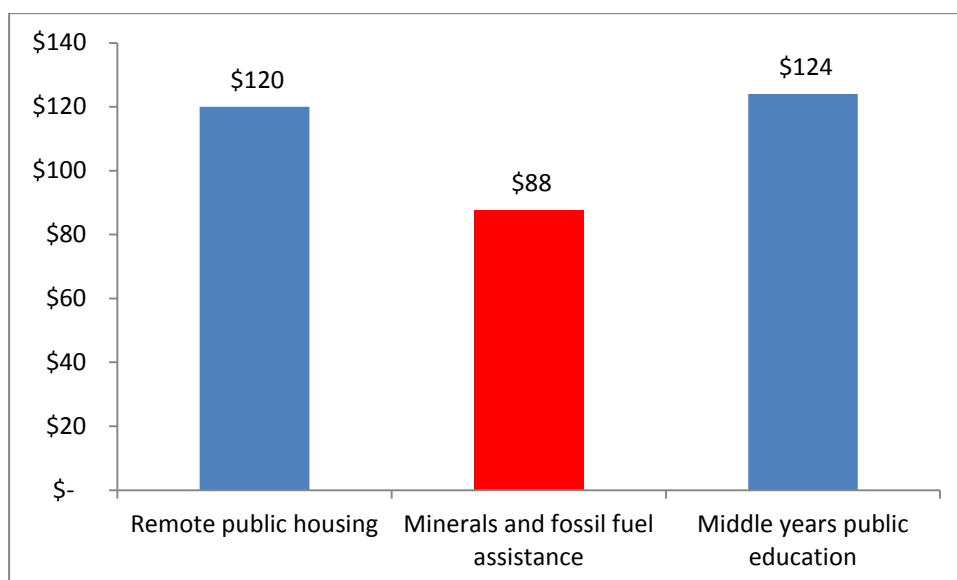
**Figure 11: Northern Territory 2013-14 budget, minerals and fossil fuel assistance and royalties**



Source: NT Budget Papers 2013-14, Budget Paper 2, p26

The Northern Territory government has budgeted to spend a similar amount on minerals and fossil fuel industry assistance as it has on remote public housing and on middle-years education, as shown in Figure 12 below:

**Figure 12: Northern Territory 2013-14 budget, minerals and fossil fuel assistance in context**



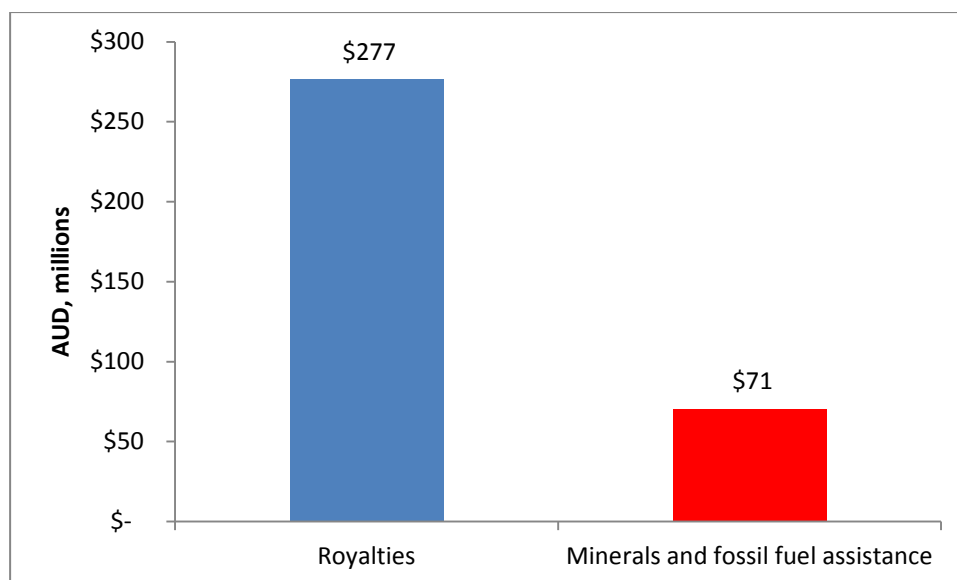
Source: NT Budget Papers 2013-14, Budget Paper 3, p189 and p201

## South Australia

South Australia has a more mature minerals and fossil fuel industry and lower levels of industry assistance than the Northern Territory. Industry assistance is considerably lower

than royalty revenue, not reaching the high proportions found in the Northern Territory, as shown in Figure 13 below:

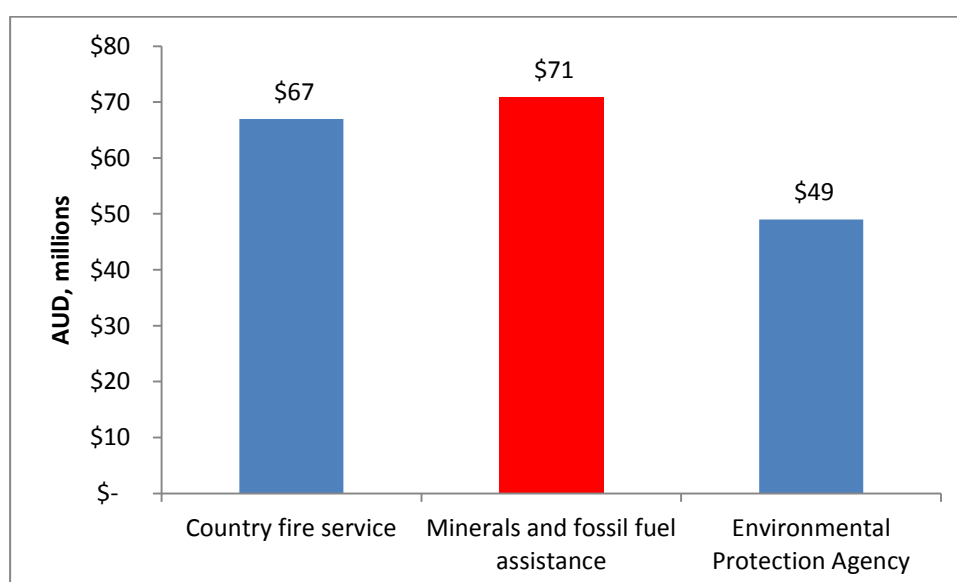
**Figure 13: South Australian 2013-14 budget, minerals and fossil fuel assistance and royalties**



Source: South Australia Budget Papers 2013-14, Budget Paper 3, p63

South Australia's spending on its minerals and fossil fuel industry is at similar levels to its spending on its country fire service and its Environmental Protection Agency, as shown in Figure 14 below:

**Figure 14: South Australian 2013-14 budget, minerals and fossil fuel assistance in context**



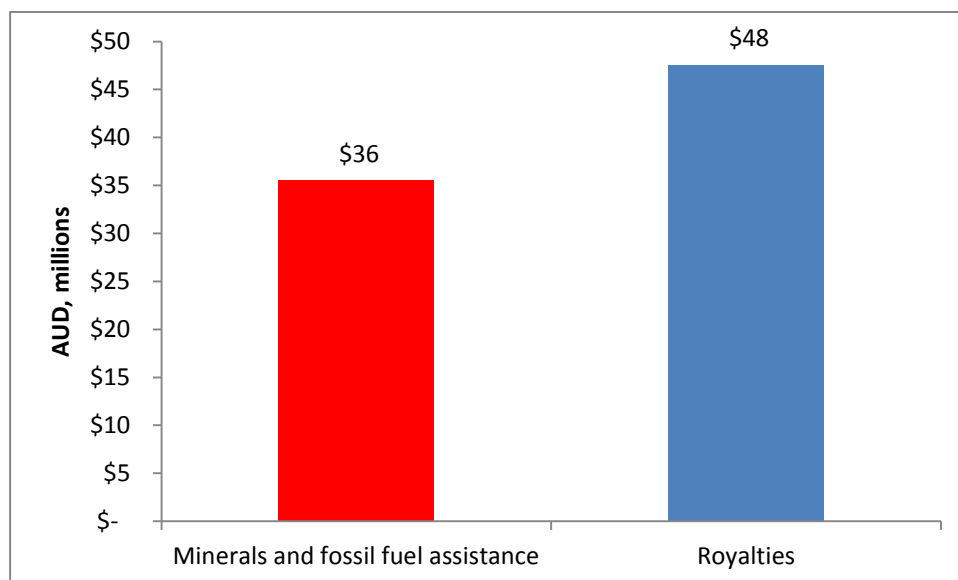
Source: SA Budget Papers 2013-14, Budget Paper 4, vol 2, p69 and 138



## Victoria

Victoria's assistance to the minerals and fossil fuel industry, particularly through its subsidisation of carbon capture and storage research, is almost equal in value to the amount Victoria receives from mining royalties, as shown in Figure 15 below:

**Figure 15: Victorian 2013-14 budget, minerals and fossil fuel assistance and royalties**



Source: Victorian Budget Papers 2013-14, Budget Paper no 5, p181

Victoria's mineral royalties are likely to be the lowest in Australia. Victoria's general royalty rate is at 2.75 per cent of market values, far lower than in other states. Some minerals are treated more generously still – gold is exempt from royalties, a policy which costs Victorians more than \$4 million per year.<sup>6</sup> This cost is not included in our analysis.

Coal royalties are charged on the basis of energy content, resulting in royalties of around \$0.50 per tonne, easily the lowest in Australia.<sup>7</sup> The 2013-14 Victorian budget papers estimate royalties of \$48.5 million, the lowest of any state.

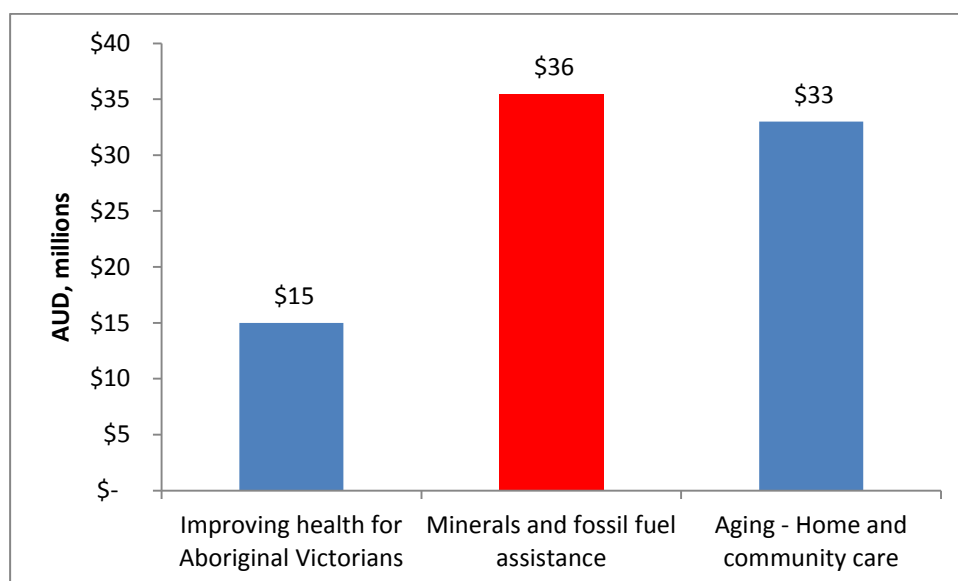
As a result, Victoria's assistance to the minerals and fossil fuel industries is almost as large as the royalties it receives. If the full costs of assistance could be broken out from the \$188 million budget of the Department of State Development, Business and Innovation's Energy and Resources section, assistance would almost certainly be greater than royalties.

Victoria's relatively large population and small minerals and fossil fuel industry means that many items in the budget are greater than this assistance. For context, the Victorian government spends more on industry assistance for the minerals and fossil fuel industries than it does on programs for aboriginal health, or home and community care, as shown in Figure 16 below:

<sup>6</sup> [http://www.energyandresources.vic.gov.au/data/assets/word\\_doc/0007/19897/MRSDA-Review-TDP4-FINAL---Royalties.doc](http://www.energyandresources.vic.gov.au/data/assets/word_doc/0007/19897/MRSDA-Review-TDP4-FINAL---Royalties.doc)

<sup>7</sup> Economists at Large (2012) *Undermined or overburdened?*

**Figure 16: Victorian 2013-14 budget, minerals and fossil fuel assistance in context**

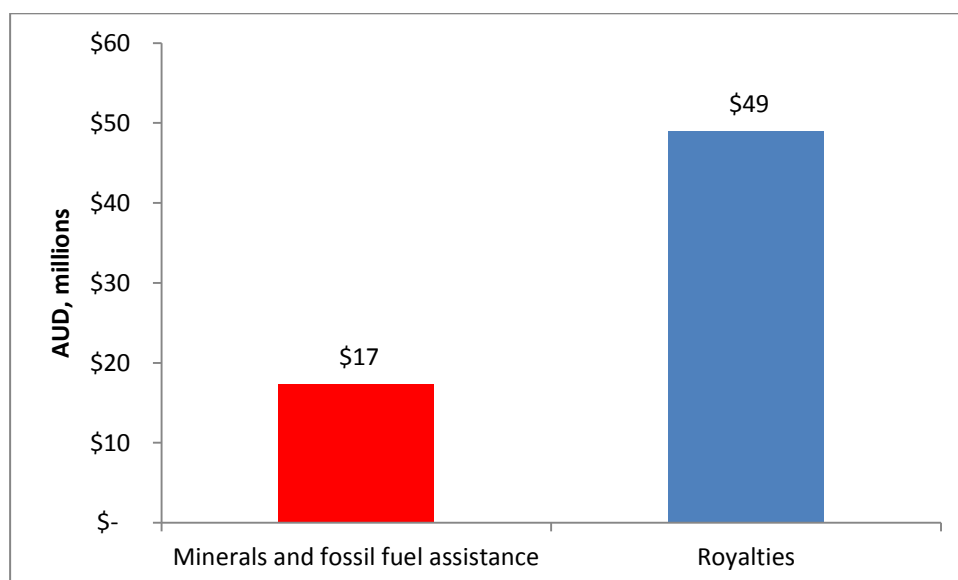


Source: Victoria Budget Papers 2013-14, Budget Paper 3, ch 1, p16

## Tasmania

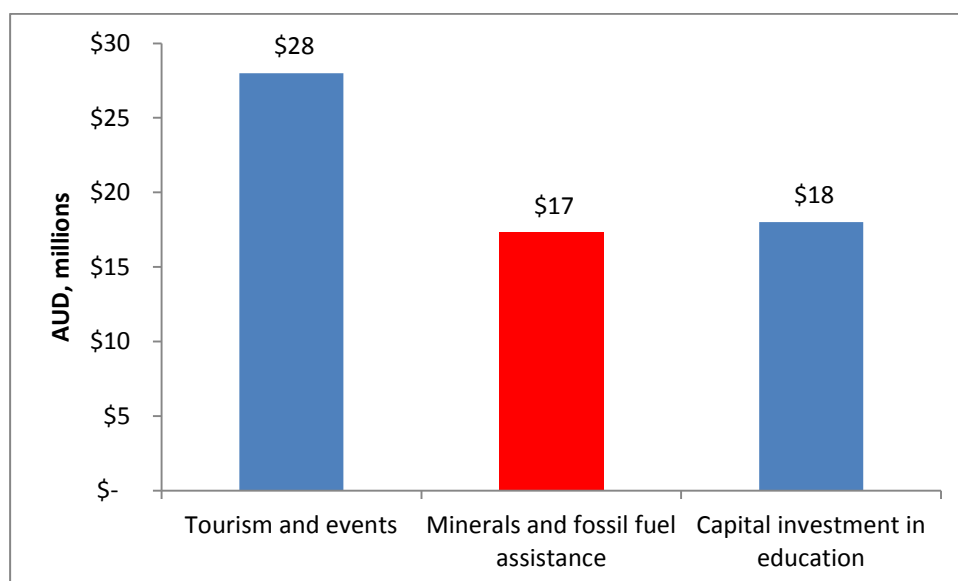
Tasmania's assistance for the minerals and fossil fuel sector is understated in our estimates, as they do not include the cost of subsidised electricity to the island's smelters. Even so, they amount to around one third of the value of mineral royalties paid to the state, as shown in Figure 17 below:

**Figure 17: Tasmania 2013-14 budget, minerals and fossil fuel assistance and royalties**



Source: Tasmanian Budget Papers 2013-14, Budget Paper 1, p4.25

This assistance compares with the budget for the state government's tourism department and with the budget for capital expenditure in education facilities, as shown in Figure 18 below:

**Figure 18: Tasmania 2013-14 budget, minerals and fossil fuel assistance in context**

Source: Tasmanian Budget Papers 2013-14, Budget Paper 2, volume 1, p2.6 and p3.16

## Conclusion

State government budget papers show that the minerals and fossil fuel industries in Australia receive billions of dollars of assistance from state governments. Supporters of Australia's minerals and fossil fuel industries are quick to point to their contribution to state government revenue as a demonstration of their industries' value and importance. They often link their royalty payments to state governments with the provision of important state-run services such as hospitals, schools, police and roads. Rarely, however, are these contributions compared to the assistance the minerals and fossil fuel industries, in turn, receive.

This paper is the first attempt to provide a quantitative estimate of the assistance state governments provide to the minerals and fossil fuel industries. All states provide millions of dollars' worth of assistance to these industries every year – the big mining states of Queensland and Western Australia routinely spend more than \$1 billion on assisting these industries.

Queensland's assistance is by far the largest of all states, totalling \$9.5 billion over the 2008-09 to 2013-14 analysis period. The largest items in our analysis relate to the provision of railway infrastructure for the coal industry and discounted access to the state's railways. The 2013-14 budgeted assistance of \$1.5 billion is around the same amount Queensland has budgeted to spend on disability services and in capital expenditure on health infrastructure.

Western Australia spent \$6.2 billion over the analysis period, particularly on roads and port infrastructure, which mainly benefits the mining and gas industries. Industry development funds also directly channel funding into assisting these industries. Western Australia's 2013-14 budgeted assistance of \$1.4 billion is more than the state has budgeted to spend on police and represents nearly one third of the entire West Australian health budget.

The assistance New South Wales gave to these industries amounted to \$872 million over the analysis period, particularly on port infrastructure, which primarily benefits the coal industry as well as on so-called 'clean coal' research. In 2013-14, the New South Wales budget papers contain \$136 million of measures that will assist the minerals and fossil fuel industries – more than the amount spent on accommodation for people with disabilities and only \$2

million less than the \$138 million to be spent on the Environmental Protection Authority – the agency which enforces environmental regulation of the mining and fossil fuel sector.

The Northern Territory's assistance to the minerals and fossil fuel industries totalled \$406 million over the analysis period, particularly on port infrastructure for the gas and mining industries, along with generous industry development funds. In the 2013-14 budget year, industry assistance will be nearly as much as the state will receive in royalties. It will cost around the same amount as other budget items such as housing for remote communities and expenses on middle-years public education.

South Australia's budget papers show that more than \$316 million was budgeted for industry assistance over this period. Major items funded included industry assistance funds, capital works and the rehabilitation of a toxic mine site. In the 2013-14 budget year, assistance worth \$71 million has been budgeted – similar amounts to the state's country fire service and environmental protection agency.

Victoria's assistance to the minerals and fossil fuel industries mainly relates to heavily subsidised research into 'clean coal'. We estimate this assistance at \$206 million between 2008-09 and 2013-14. This is considerably more than Victoria spends on improving health for aboriginal Victorians and more than it spends on its home and community care program.

Tasmanian budget papers outline \$54 million worth of assistance to its minerals and fossil fuel sector over this period, relating to industry promotion and capital works, although the largest subsidy – cheap electricity for smelters – is not outlined in budget papers. Tasmania spends similar amounts on capital works relating to education and only slightly more on tourism and events.

## References

- Australian Coal Association Low Emmissions Technology website, accessed 28 May 2014, available at <http://www.newgencoal.com.au/about-us.html>
- ACF. (2011). *Drill now, pay later: The growing cost of tax breaks for the oil and gas industry in Australia*. Australian Conservation Foundation. Retrieved from [http://www.acfonline.org.au/sites/default/files/resources/Drill\\_now\\_pay\\_later\\_final.pdf](http://www.acfonline.org.au/sites/default/files/resources/Drill_now_pay_later_final.pdf)
- BHP Billiton, *Olympic Dam Expansion EIS: Materials Handling and Transport*, retrieved from <http://www.bhpbilliton.com/home/aboutus/regulatory/Documents/Olympic%20Dam%20Supplementary%20EIS/Information%20Sheets/Olympic%20Dam%20EIS%20Materials%20Handling%20And%20Transport.pdf>
- Bunbury Port Authority website, accessed 22 May 2014, available at <http://www.byport.com.au/>
- Chevron Australia, *Wheatstone Project*, accessed 23 May, available at <https://www.chevronaustralia.com/our-businesses/wheatstone>
- Cubby B and Moore M (2009) 'Coal group to reap millions from budget', *The Sydney Morning Herald*, 20 June.
- Department of the Environment, *Geelong-Shell Water Recycling Project (also known as the Northern Water Plant)*, accessed 23 May 2014, available at <http://www.environment.gov.au/node/24286>
- Department of Manufacturing, Innovation, Trade, Resources and Energy, *Brunkunga mine site*, Government of South Australia, accessed 26 May 2014, available at [http://www.pir.sa.gov.au/minerals/mines\\_\\_\\_and\\_\\_\\_developing\\_projects/former\\_mines/brunkunga\\_mine\\_site](http://www.pir.sa.gov.au/minerals/mines___and___developing_projects/former_mines/brunkunga_mine_site)
- Department of State Development, Business and Innovation, *Government has a role*, State Government of Victoria, accessed 26 May 2014, available at <http://www.energyandresources.vic.gov.au/energy/innovation-and-research/etis/advanced-lignite-demonstration-program/aldp-prospectus/government-has-a-role>
- Department of State Development, Business and Innovation, *Why we need the CarbonNet Project*, State Government of Victoria, accessed 26 May 2014, available at <http://www.energyandresources.vic.gov.au/energy/sustainable-energy/carbon-capture-and-storage/the-carbonnet-project/why-we-need-the-carbonnet-project>
- Economists at Large. (2012). *Undermined or Overburdened? Victoria's brown coal: an economic perspective*. Commissioned by Environment Victoria. Retrieved from <http://www.ecolarge.com/work/undermined-or-overburdened/>
- Electricity Industry Panel (2011) *Tasmania's Energy Sector – an Overview*, accessed 28 May 2014. Available at: [http://www.electricity.dpac.tas.gov.au/\\_\\_\\_data/assets/pdf\\_file/0017/141803/Tasmania\\_s\\_Energy\\_Sector\\_-\\_an\\_Overview.PDF](http://www.electricity.dpac.tas.gov.au/___data/assets/pdf_file/0017/141803/Tasmania_s_Energy_Sector_-_an_Overview.PDF)
- Energy and earth resources, *Government has a role*, Department of State Development, Business and Innovation, viewed 23 May,

<http://www.energyandresources.vic.gov.au/energy/innovation-and-research/etis/advanced-lignite-demonstration-program/aldp-prospectus/government-has-a-role>

Environment Victoria, & Market Forces. (2013). *Ending the fossil fuel industry's age of entitlement: An analysis of Australian Government tax measures that encourage fossil fuel use and more pollution*. Retrieved from [http://environmentvictoria.org.au/newsite/sites/default/files/useruploads/EV & MF\\_Fossil fuel subsidies in 2014\\_FINAL.pdf](http://environmentvictoria.org.au/newsite/sites/default/files/useruploads/EV%20&%20MF_Fossil_fuel_subsidies_in_2014_FINAL.pdf)

Esperance Ports Sea and Land, *About Esperance Ports Sea and Land*, accessed 23 May 2014, available at <http://www.esperanceport.com.au/about.asp>

Government of Western Australia, *Anketell Port and Strategic Industrial Area Fact Sheet*, retrieved from [http://www.dsd.wa.gov.au/documents/Anketell\\_Fact\\_Sheet\\_-\\_Final.pdf](http://www.dsd.wa.gov.au/documents/Anketell_Fact_Sheet_-_Final.pdf)

Grudnoff M (2012) *Pouring Fuel on the Fire: The nature and extent of Federal Government subsidies to the mining industry*, Policy Brief No. 38, The Australia Institute, April.

Grudnoff M (2013) *Pouring more fuel on the fire: the nature and extent of federal government subsidies to the mining industry*, Policy Brief No. 52, The Australia Institute, June.

Heber A (2013) 'Discount mining royalties on the table for Galilee miners', *Australian Mining*, 7 November.

Heber A (2013) 'Olympic Dam expansion too much of a challenge for BHP', *Australian Mining*, 27 September.

IMF. (2013). *Energy subsidy reform: Lessons and implications*. International Monetary Fund. Retrieved from <https://www.imf.org/external/np/pp/eng/2013/012813.pdf>

Lannin S (2010) 'QR National float surprises market', *PM*, 22 November, <http://www.abc.net.au/pm/content/2010/s3073372.htm>

Macdonald, I. (2008). *Mining act 1992 - determination under section 283(5)* (Vol. 283, pp. 1–7). Amendment to Mining Act 1992 by former Minister for Mineral Resources, Ian Macdonald.

Newcastle Port Corporation, *Trade Statistics*, accessed 23 May 2014, available at <http://www.newportcorp.com.au/site/index.cfm?display=111694>

News.com.au (2012) 'Wer'e in the coal business': Campbell newman slams UNESCO Great Barrier Reef warning, 2 June, Retrieved from <http://www.news.com.au/national/unesco-slams-great-barrier-reef-management-youve-got-eight-months-to-fix-it/story-e6frfw0-1226381188474>

Nicholls S (2013) 'Port leases garner \$5 billion windfall for state government', *The Sydney Morning Herald*, 12 April.

NSW Auditor General. (2012). *Report to Parliament, Volume four, Cobbora Holding Company Pty Limited* (pp. 59–62). Retrieved from [http://www.audit.nsw.gov.au/ArticleDocuments/253/12\\_Volume\\_Four\\_2012\\_Cobbora\\_Holding\\_Company\\_Pty\\_Ltd.pdf.aspx?Embed=Y](http://www.audit.nsw.gov.au/ArticleDocuments/253/12_Volume_Four_2012_Cobbora_Holding_Company_Pty_Ltd.pdf.aspx?Embed=Y)

- NSW DII. (2008). NSW Coal Mining Guidelines for Royalty Compliance. NSW Department of Industry and Investment. Retrieved from [http://www.resources.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0007/399562/Royalty-and-Statistics-Guidelines-Coal.pdf](http://www.resources.nsw.gov.au/__data/assets/pdf_file/0007/399562/Royalty-and-Statistics-Guidelines-Coal.pdf)
- NSW Legislative Assembly (2009) *Hansard, Questions Without Notice: Mining Infrastructure and Jobs*, 18 June 2009, pp. 16280.
- NSW Mining (2013) *Helping put teachers in classrooms & nurses in hospitals*, NSW Minerals Council, viewed 23 May 2014  
<http://www.worldclassminers.com.au/news/economy/helping-put-teachers-in-classrooms-nurses-in-hospi/>
- NSW Treasury. (2013). *NSW Budget Papers 2013-14, Chapter 9 : Public Trading Enterprises* (pp. 1–20). Retrieved from [http://www.budget.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0018/25227/Ch\\_9.pdf](http://www.budget.nsw.gov.au/__data/assets/pdf_file/0018/25227/Ch_9.pdf)
- NSW Treasury (2013) *NSW Budget Papers 2013-14, Chapter 6, General Government Revenue* (pp. 6–9). Retrieved from [http://www.budget.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0015/25224/Ch\\_6.pdf](http://www.budget.nsw.gov.au/__data/assets/pdf_file/0015/25224/Ch_6.pdf)
- OECD. (2013). *Australia: Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels*. Organisation for Economic Cooperation and Development, OECD Publishing: OECD Publishing.
- Perdaman Industries, *Collie Urea Manufacturing*, accessed 20 May 2014, available at <http://www.perdaman.com.au/our-operations/collie-urea-manufacturing.aspx>
- Port Headland Port Authority, *2012-13 Cargo Statistics and Port Information*, retrieved from <http://www.phpa.com.au/About-the-Port/Statistics/Cargo-statistics-and-port-information/PDF-File/2012-13-Stats-brochure-electronic.aspx>
- Queensland DIP. (2010). *Coal Plan 2030*. Published by Queensland Department of Infrastructure and Planning. Retrieved from <http://www.dlg.qld.gov.au/resources/plan/cg/coal-plan-2030.pdf>
- Queensland Government. (2013). *Galilee Basin Development Strategy*. Brisbane, Queensland. Retrieved from [www.dsdip.qld.gov.au](http://www.dsdip.qld.gov.au)
- Queensland Government (2013) 'Ministerial Media Statements' Plan to develop Galilee Basin unveiled Premier Campbell Newman and Deputy Premier, Minister for State Development, Infrastructure and Planning Jeff Seeney, 7 November, 2013
- Quiggin J (2009) *Economists statement on Queensland asset sales*, accessed 23 May, retrieved from <http://johnquiggin.com/2009/11/24/economists-statement-on-queensland-asset-sales/>
- Quiggin J (2010) 'Bad politics makes bad policy: the case of Queensland's asset sales program', *Australian Public Policy Program Working Paper: P10#1*, The University of Queensland.
- Stanford L (2013) '\$9.5 million for Ulan Road', *Mudgee Guardian*, 11 October.

- Turton H (2002) *The Aluminium Smelting Industry: Structure, market power, subsidies and greenhouse gas emissions*, Discussion Paper No. 44, The Australia Institute, January.
- Validakis V (2013) 'Funding plan for Ulan Road slammed by local council', *Australian Mining*, 18 June.
- Validakis V (2014) '\$6 billion Oakajee port and rail funding partner revealed', *Australian Mining*, 22 April.
- Wiggins J, Cranston M and Thompson S (2012) 'Newman's bags \$400m in QR sale', *Financial Review*, 8 October.
- Wiggins J (2014) 'Port of Newcastle leased to Hastings in \$1.75 billion deal', *The Sydney Morning Herald*, 30 April.



## Appendix A – Methodology

The data for this paper comes from the state and territory budget papers over the period 2008-09 to 2013-14. Budget papers are prepared by state treasury departments each year and contain details of most government transactions, although some are confidential and specific details are not always disclosed. All budget papers are readily available on state government websites.

State government budget papers are divided into several parts. While there are some differences over time and between states, all are presented in a broadly similar format and structure. For example, the Queensland government's most recent budget is divided into:

- **Budget Paper 1** – The budget speech by the state treasurer, which provides an overview of the budget.
- **Budget Paper 2** – Strategy and Outlook, which discusses the government's fiscal and economic strategy and wider economic conditions.
- **Budget Paper 3** – Capital Statement, which presents proposed capital outlays for the year ahead.
- **Budget Paper 4** – Budget measures, record of the government's expenses and revenues over the past year, broken down by government portfolio.
- **Budget Paper 5** – Service Delivery Statements, which outlines the planned services and resources that each department will use through the year as well as outlining adjustments to the budget of the year before.
- **Concession statement** – Information on the costs of tax breaks and price concessions provided by the government
- **Appropriation Bills** – The relevant bills, for which assent is needed to officially approve the operation of the budget.

The Queensland data used in this paper comes predominantly from Budget Papers 2 and 3 (Strategy and Outlook and the Capital Statement), as well as significant items in the Concession Statement. Other jurisdictions tend to combine some of the sections above into fewer separate documents. For example, New South Wales publishes only five budget papers in total, with its Budget Paper 2 – Budget Statement containing broadly equivalent information to Queensland's Budget Papers 2 and 4 above. The New South Wales assessment of concessions and tax expenditures is included in an appendix.

Once the relevant sections of each state's budget papers are known, it is then necessary to identify the relevant items which relate to the minerals and fossil fuel industries.

### Identifying relevant expenditure

Identifying which items of state government expenditure are relevant to the minerals and fossil fuel industries is simple for some items, as their title immediately suggests their intended beneficiaries. For example in New South Wales the 'Clean Coal Fund' and 'Assistance package for the Western and Gunnedah Coalfields' are obviously measures associated with the coal mining industry, as shown in Figures A1 and A2 below, which are snapshots taken from the New South Wales budget papers.

Figure A1: Identifying relevant expenditure – New South Wales Clean Coal Fund

DEPARTMENT OF INDUSTRY AND INVESTMENT			
SERVICE GROUP STATEMENTS (CONT)			
Mineral Resources and Mine Safety (cont)			
	2009-10		2010-11
	Budget	Revised	Budget
	\$000	\$000	\$000
<b>Financial Indicators:</b>			
Total Expenses Excluding Losses	68,142	84,452	83,671
Total expenses include the following:			
Employee related	32,424	42,363	38,076
Other operating expenses:	31,147	28,441	40,405
Clean Coal Fund	16,500	10,000	21,500
Coal compensation expense	...	8,720	...
Other expenses	1,909	10,622	1,950
Total Retained Revenue	52,218	56,524	51,123
NET COST OF SERVICES	14,604	27,879	32,465
CAPITAL EXPENDITURE	2,936	2,936	3,284

Source: 'Clean Coal Fund' – 2010-11 NSW Budget Paper 3: Budget Estimates; Portfolio of Industry and Investment; Service Group Statements – Mineral Resources and Mine Safety (p. 7.28)

Figure A2: Identifying relevant expenditure – Assistance package for the Western and Gunnedah Coalfields

DEPARTMENT OF INDUSTRY AND INVESTMENT			
SERVICE GROUP STATEMENTS (CONT)			
Investment Attraction and Industry Development (cont)			
	2009-10		2010-11
	Budget	Revised	Budget
	\$000	\$000	\$000
<b>Financial Indicators:</b>			
Total Expenses Excluding Losses	87,789	84,739	129,838
Total expenses include the following:			
Employee related	13,340	14,131	16,162
Other operating expenses	4,405	5,675	3,781
Grants and subsidies:	21,568	21,568	18,375
New South Wales Film and Television Office grant	13,824	13,824	8,416
Other expenses:	48,084	42,973	91,095
Assistance to industries	22,148	23,683	35,727
Assistance package for the Western and Gunnedah Coalfields	10,000	10,000	10,000
Major Investment Attraction Scheme	10,000	4,000	40,000
Total Retained Revenue	1,150	2,406	1,687
NET COST OF SERVICES	86,639	82,333	128,151
CAPITAL EXPENDITURE	179	179	113

Source: 'Assistance package for the Western and Gunnedah Coalfields' – 2010-11 NSW Budget Paper 3: Budget Estimates; Portfolio of Industry and Investment; Service Group Statements – Mineral Resources and Mine Safety (p. 7.32)

Other items of relevant expenditure require further investigation as their titles do not necessarily relate to the minerals and fossil fuel industries. This is particularly the case for the infrastructure projects that these industries rely on, such as railways, ports and water supply. For example, the 'Goonyella-Abbot Point rail expansion' in Queensland and the

'Geraldton Port Authority' in Western Australia are not obviously expenditure on the coal and iron ore industries, but further investigation reveals that they are in fact dedicated to these industries. Snapshots from the Queensland and Western Australian budget papers relating to these items are shown in Figures A3 and A4 below:

**Figure A3: Identifying relevant expenditure – Goonyella-Abbot Point rail expansion**

Transport and Main Roads					
Project	Statistical Division	Total Estimated Cost \$'000	Expenditure to 30-06-10 \$'000	Budget 2010-11 \$'000	Post 2010-11 \$'000
<b>QR LIMITED</b>					
<b>Property, Plant and Equipment</b>					
<b>QR Network</b>					
Goonyella to Abbott Point Expansion: Infrastructure Works	40	830,685	18,685	502,197	309,803

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Capital Statement 2010-11

Source: 'Goonyella-Abbot Point rail expansion' – 2010-11 Queensland Budget Paper 3: Capital Statement; Portfolio of Transport and Main Roads – QR Limited (p. 122)

**Figure A4: Identifying relevant expenditure – Geraldton Port Authority**

GERALDTON PORT AUTHORITY							
ASSET INVESTMENT PROGRAM							
The Authority is progressing with Oakajee Stage 1 and for 2013-14 includes planned expenditure of \$3.8 million for further development of the Port's masterplan, due diligence, detail design, land use planning, port simulation studies and security planning.							
An amount of \$2.3 million will be spent to upgrade the information technology (IT) software to facilitate ship navigation in the harbour and an additional \$1.3 million will be spent to purchase a Pilot Boat to meet the demand of expected increased ship arrivals due to expected increase in throughput.							
Funding of \$5 million has been allocated to minor works, which in 2013-14 will be applied to upgrading the Port's services and civil infrastructure, security, environmental systems and equipment replacement.							
	Estimated Total Cost \$'000	Estimated Expenditure to 30-6-13 \$'000	2012-13 Estimated Expenditure \$'000	2013-14 Estimated Expenditure \$'000	2014-15 Forward Estimate \$'000	2015-16 Forward Estimate \$'000	2016-17 Forward Estimate \$'000
<b>WORKS IN PROGRESS</b>							
IT Software Upgrade .....	2,500	200	200	2,300	-	-	-
Oakajee Project .....	9,369	5,585	2,901	3,784	-	-	-
Pilot Boat .....	2,500	1,250	1,250	1,250	-	-	-
<b>COMPLETED WORKS</b>							
Miscellaneous Works - 2012-13 Program .....	5,000	5,000	5,000	-	-	-	-

Source: 'Geraldton Port Authority – 2013-14 WA Budget Paper 2, Vol 1: Budget Statements (p. 417)

Identifying relevant expenditures is greatly assisted by a working knowledge of the minerals and fossil fuel industry in each state. Projects such as Goonyella-Abbot Point Rail project and Geraldton Port Authority's Oakajee Port project are regularly in the news and are well known to industry watchers and can be easily identified.

Further, these industries are often focused in particular geographical regions of each state – Abbot Point is near Bowen, the hub of the Queensland coal industry and Geraldton services Western Australia's Mid-West iron ore sector. For researchers familiar with these areas, relevant projects can be identified by checking news archives, company websites, annual reports and through personal communication.

While the New South Wales Clean Coal fund and coalfield assistance packages are clearly examples of payments to a particular industry, the Goonyella-Abbot Point rail project and

Geraldton Port Authority investment program show some of the subtleties of state government spending on the minerals and fossil fuel industries. The Goonyella-Abbot Point rail project is assistance in the form of provision of capital infrastructure, wholly devoted to the Queensland coal industry. The Geraldton Port Authority's Oakajee Project relates to a proposed new iron ore port, while expenditure on other parts of its investment program, such as the new pilot boat, benefits not only the minerals industry, but also some agricultural users.

As state government spending on the minerals and fossil fuels industries takes many forms, we have categorised each expenditure item to enable further analysis.

## Categorising expenditure

Items from the budget papers identified as being expenditure relevant to the minerals and fossil fuel industries were then categorised according to industry segment and level of dedication to these industries.

### *Industry Segment*

All items of expenditure identified as being related to the mineral and fossil fuel industries are categorised as being related to a particular industry segment, one of:

- Coal transport
- Coal consumption
- Coal mining
- Gas consumption
- Gas extraction
- Gas processing
- Minerals processing
- Mining (other than coal)
- Petroleum processing
- Petroleum use
- Multiple

Expenditure categorised as 'multiple' either provides support to several categories, or relates to broad industry development. An example of this is Western Australia's 'Port Hedland Port Authority (Capital works)'. This 'controlled grant' of \$22 million was used to upgrade infrastructure for iron ore shipments and construction of facilities associated with gas processing. Figure A5 below shows the item listed in the 2010-11 West Australian budget papers:

**Figure A5: Example of item categorised as 'multiple' – Port Headland Port Authority (Capital Works)**

122		Treasury and Finance - continued					
	2008-09 Actual <sup>(a)</sup>	2009-10 Budget	2009-10 Estimated Actual	2010-11 Budget Estimate	2011-12 Forward Estimate	2012-13 Forward Estimate	2013-14 Forward Estimate
	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
<b>CAPITAL</b>							
Item 118 Capital Appropriation.....	190,470	39,190	55,370	96,627	58,344	2,739	-
<i>Government Equity Contributions</i>							
Item 119 – Armadale Redevelopment Authority.....	5,900	6,000	2,660	6,600	3,340	-	-
Item 120 – Department of Corrective Services <sup>(a)</sup> .....	-	53,000	16,095	69,050	90,300	100,946	97,554
Item 121 – Electricity Generation Corporation (Verve Energy).....	-	83,277	82,233	165,508	15,700	50,000	-
Item 122 – Electricity Networks Corporation (Western Power).....	6,651	651	651	809	5,636	5,000	5,000
Item 123 – Forest Products Commission.....	16,200	1,200	1,270	70	-	-	-
Item 124 – Fremantle Port Authority.....	212	210	209	3,104	2,000	-	-
Item 125 – Port Hedland Port Authority.....	-	21,000	21,000	750	-	-	-
Item 126 – Royalties for Regions.....	64,900	329,600	305,836	363,299	476,712	486,129	539,665
Item 127 – WA Health <sup>(a)</sup> .....	86,969	169,977	163,410	186,407	205,743	154,480	177,247
Item 128 – Water Corporation of Western Australia.....	-	7,730	7,730	8,280	8,860	9,490	5,080
Broome Port Authority.....	350	-	-	-	-	-	-
Regional Power Corporation (Horizon Power).....	-	10,612	3,514	-	-	-	-
Rottne Island Authority.....	7,623	-	-	-	-	-	-

'Port Hedland Port Authority (Capital works)' – 2010-11 WA Budget Paper 2, Vol 1: Budget Statements; Portfolio of Treasury and Finance – Administered Capital Contributions (p. 122)

Items categorised as relating to multiple sectors relate only to other sectors of the minerals and fossil fuel industries. Expenditure items were also assessed as to whether they are wholly dedicated to these industries, or if they also provide benefits to other industries not related to the minerals and fossil fuel sector.

### *Level of dedication*

Each item of expenditure is categorised by its level of dedication to the minerals and fossil fuels industries. Each item was assessed as being wholly, primarily or only partly dedicated to these industries.

Items considered wholly dedicated to these industries are undertaken for a singular and specific role to support the development, extraction, processing or transport of mineral and fossil fuel commodities. For example, the Clean Coal Fund, Assistance package for the Western and Gunnedah Coalfields and the Goonyella-Abbot Point' rail expansion projects discussed above are all considered wholly dedicated to these industries. They consist of direct assistance to industry in the first two instances, or provision of infrastructure used exclusively by the coal industry in the latter.

Where an expenditure item is largely aimed at assisting the operation, development, extraction, processing or transport of mineral and fossil fuel commodities, but where there are substantial material benefits to other users of infrastructure, these items have been categorised as *primarily* dedicated to these industries. The Port Hedland Port Authority (Capital works) and Geraldton Port Authority-Pilot vessel discussed above are both examples of infrastructure primarily aimed at benefiting the minerals and fossil fuel industries, which also provide benefits to other stakeholders.



Where an expenditure program is categorised as ‘partly’ dedicated to the mineral and resources industries, the minerals and fossil fuel industries receive a tangible economic benefit from spending, but this benefit is not the primary aim of the project, or it is not clear which stakeholders receive the primary benefit. Network infrastructure programs often come under this category, such as electricity, water and rail networks. In these networks, minerals and fossil fuel industries are major users of networks, but there are other residential or agricultural users.

Examples of expenditure categorised as partly dedicated to the minerals and fossil fuel industries are the Port of Wyndham feasibility works and Ord River pipeline and hydro-electricity network projects, in northern Western Australia. These projects will deliver benefits to the agricultural sector and the minerals and fossil fuel industries, including base metal operations, diamond mining and nickel concentrate shipments. While a tangible benefit to these projects is clear, exactly how these benefits will be shared with agricultural and other stakeholders is not clear from available sources.

Where minerals and fossil fuel industries benefit from spending on network infrastructure, but these benefits are incidental, they have been omitted from the analysis. While all users of network infrastructure benefit from an upgrade of the network, where spending is only benefiting these industries as users in a peripheral way, it was not included in our assessment.

Examples of projects that would benefit the minerals and fossil fuel industries, but were omitted from the analysis are water infrastructure projects in the Barwon region near Geelong in Victoria such as the Anglesea Borefield Project and Black Rock Recycled Water Plant. Minerals processing and petroleum-refining industries are major users of water in the area and will benefit from investment in the whole water network, but residential and agricultural users are the primary beneficiaries.

## **Further notes on methodology**

Having methodology based on budget papers’ reported items can result in sources of understatement in our data. This is particularly the case with government departments. Other technical issues are also discussed below.

### *Budget paper methodology and sources of understatement*

It is important to note that by taking data strictly from state budget papers, this methodology is likely to deliver an underestimate of relevant state government expenditure. This is because not all relevant expenditure is identifiable in the budget papers, even with considerable further investigation. Often the way budget papers are structured means that spending that is clearly aimed at benefiting the minerals and fossil fuel industries is not readily identifiable.

For example, Victoria’s Department of Primary Industries hosted Clean Coal Victoria for most of the analysis period. Clean Coal Victoria aims to “develop strategic plans to manage Victoria’s lignite resource”.<sup>8</sup> However, as the Victorian budget papers include Clean Coal Victoria’s budget within a larger item of ‘Primary Industries Policy’, this expenditure cannot be identified and our analysis is likely to understate expenditure on this program. See the Victoria section for more details.

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<sup>8</sup> Energy and Earth Resources, (n.d.) *Government has a role*

## *Treatment of government departments and programs*

Clean Coal Victoria is a government program clearly devoted to promoting the minerals and fossil fuel industries and its budget has been included in our analysis. Other government departments relate to administering and regulating these industries – for example, in Victoria the state Environmental Protection Agency has considerable involvement in monitoring and enforcing environmental regulations – but they have been excluded from our analysis. Expenditure relating to monitoring and enforcement is not included because this relates to regulation of the state's environmental assets, rather than promotion of industry and undertaking functions that directly benefit industry.

Considerable grey area can exist in such departments. For example, the New South Wales Department of Trade and Investment, Regional Infrastructure and Services section, Energy and Resources program carries out many functions that promote and assist the state's coal industry, but also engages in functions relating to safety and environmental performance.<sup>9</sup> Departments with substantial crossover between regulation and promotion have been entirely excluded from our assessment.

A good example of these different functions is in the Tasmanian Department of Infrastructure, Energy and Resources's Mineral Resources Management and Administration Output Group. This Group has two sections. The Minerals Exploration and Land Management section focuses on:<sup>10</sup>

- improving the quality and quantity of geoscience information, including the development of a revised three dimensional geological model of the state, with a view to encouraging mineral exploration
- promoting Tasmania nationally and internationally through targeted and strategic marketing.

As this section aims mainly to encourage and promote, it is included in our analysis. The other section, Tenement Management of the Exploration and Minerals Industry has not been included as it focuses on:<sup>11</sup>

- administering legal titles for mining tenements
- managing royalty regimes and collecting fees and rentals.

These two sections are separate items in the Tasmanian budget papers, enabling their separate treatment. Had they not been reported as separate line items, expenditure on both would have been omitted.

## *Technical considerations*

Budget paper line items are reported as different amounts depending on the year. In most instances the item will be 'budgeted' for the coming financial year and an 'estimated actual' figure is posted for the previous financial year. These categories can be seen in Figure 5 above, where the Port Headland Port Authority's capital spending is reported as budgeted and estimated actual for the beginning and ending financial years. In some places final 'actual' figures and future 'forward estimates' are provided, as in Figure 5. Our estimates are based on estimated actual figures aside from the current financial year, where we have included budgeted figures.

The full list of individual projects and programs included in this analysis is included as an Appendix C.

<sup>9</sup> See NSW Budget Papers 2013-14, Budget paper 3, Chapter 8, p8-9 for further description.

<sup>10</sup> Tasmanian Budget Papers 2009-10, Budget Paper 2, Volume 1, Chapter 6, p6.14

<sup>11</sup> Tasmanian Budget Papers 2009-10, Budget Paper 2, Volume 1, Chapter 6, p6.15

## Appendix B – Details of selected subsidies by state

This appendix provides a greater level of detail on the assistance provided by each state to the minerals and fossil fuel industries. Assistance is broken down by year through the analysis period, by level of dedication and by industry segment. The key themes and projects of each state are discussed in greater detail.

### Queensland

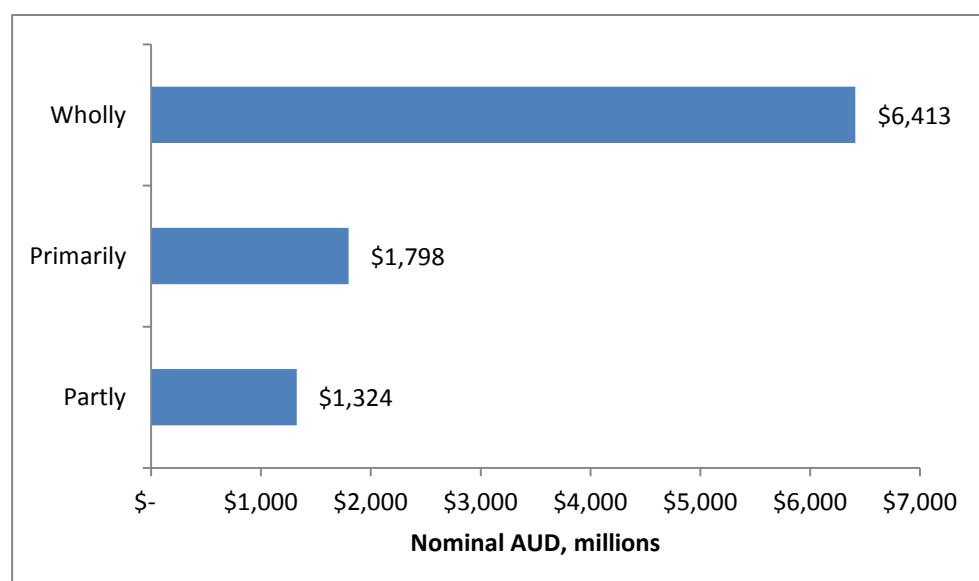
Queensland's assistance to the mineral and fossil fuel industries is, by far, the largest of any state, with a total of more than \$9.5 billion spent between 2008-09 and 2013-14, accounting for over 50 per cent of all state government assistance to these industries.

**Table B1: Queensland expenditure by year (\$ million)**

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Total
Queensland	2,932.7	1,525.8	1,362.9	831.1	1,398.9	1,489.6	9,541.1

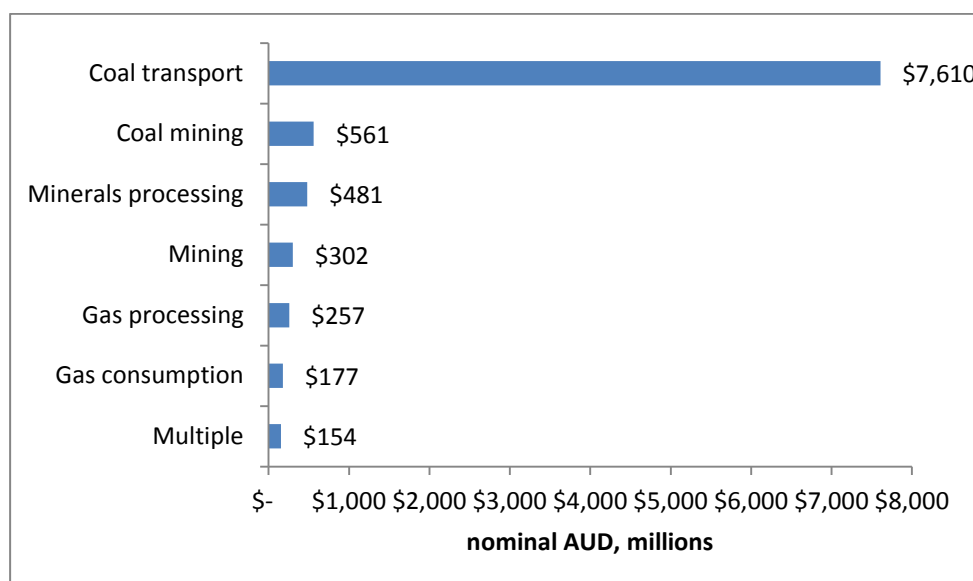
Queensland's spending has primarily been directed at projects wholly related to these industries, rather than shared with other users, as shown in Figure B1 below:

**Figure B1: Queensland spending by level of dedication**



The vast bulk of these have been to the coal transport sector, as shown in Figure B2 below:



**Figure B2: Queensland spending by industry segment**

### Queensland – key themes and projects

The vast bulk of Queensland's assistance to the minerals and fossil fuel industry relates to the transport of coal, by rail and at coal ports. Our analysis finds that \$4.6 billion dollars was spent in the period of analysis on wholly-devoted, new capital expenditure for coal transport – mainly railways and ports. Some of these assets were privatised during this period, with little discussion of this expenditure. Many of these projects are outlined in the Queensland Government's Coal Plan and its Galilee Basin Development strategy.<sup>12</sup>

Queensland's most recent budget papers take a different approach to earlier papers and those of other states in reporting government concessions. These differences affect mainly rail infrastructure, but also other aspects of assistance for minerals and fossil fuel industries.

#### *Rail infrastructure*

Over \$3.7 billion was spent on the rail network and rolling stock between 2008-09 and 2013-14. Some of these projects involved expenditures of hundreds of millions of dollars, such as the Goonyella-Abbot Point Expansion and the Jilalan Rail Yard upgrade.

The Queensland Government spent \$831 million on the Goonyella-Abbot Point Expansion, mainly between 2010 and 2012. The project, located in Central Queensland's Bowen Basin is often referred to as the 'missing link' project, as it connected two coal railway systems. It enables coal mines that were previously only able to ship coal out of Hay Point, near Mackay, to rail coal to Abbot Point near Bowen.

The Jilalan Rail Yard near Mackay coordinates train and wagon configuration and queuing and links the Bowen Basin coal mines to the port terminals of Hay Point and Dalrymple Bay. It was built in the 1970s and received a major upgrade between 2008 and 2010 at a cost to the Queensland government of \$485.6 million.

Our analysis shows there was investment in 44 other capital projects for rail infrastructure and rolling stock, mainly early in the 2008-09 to 2013-14 analysis period. Much of this was in the lead up to the privatisation of Queensland rail assets.

<sup>12</sup> Queensland DIP (2010) *Coal Plan 2030*; Queensland Government (2013) *Galilee Basin Development Strategy*

### *Privatisation of Queensland Rail*

In 2010 the Queensland Government separated QR National (coal and freight haulage) from QR Limited (passenger and network infrastructure services). The former was privatised through stock market listing in November that year. The sale of 66 per cent of the Queensland government's stake raised \$4.6 billion for the government, a price that was well received by some in the media at the time.<sup>13</sup> In 2012 the Liberal National Party administration then reduced the government's ownership stake from around 34 per cent to 16 per cent for around \$1.5 billion.<sup>14</sup> The sale of QR national was widely criticised by economists as representing poor value for money for Queensland taxpayers.<sup>15</sup> QR National was rebranded as Aurizon in December 2012, which had stock market valuation of \$10.9 billion at time of writing.

While a full assessment of the sale estimating the loss to taxpayers associated with the privatisation of QR National is beyond the scope of this project, our results suggest that Queensland taxpayers spent around \$3 billion on capital investment in the years leading up to the privatisation. Major capital projects during this period included the Missing Link and Jilalan projects mentioned above, the procurement of 1,190 New VCA 106T coal wagons worth \$156 million and many other smaller expenditure items listed in the appendix.

### *Port Projects*

The Queensland Government spent over \$2.6 billion dollars on port projects during the analysis period. Major projects included the RG Tanna Coal Terminal Expansion and several expansions of the Abbot Point coal port.

The RG Tanna Coal Terminal is one of the terminals at the Port of Gladstone in Central Queensland. The Queensland government spent \$780 million on expanding the RG Tanna Coal Terminal (RGTCT) through the analysis period, through the government-owned Gladstone Port Corporation.

The Abbot Point Coal Terminal is owned by the government-owned North Queensland Bulk Ports Corporation (NQBPC) and is Australia's most northernmost coal port. The port's X25 expansion from 21 to 25 million tonnes of coal per year was completed in June 2009. The recent X50 expansion has doubled the terminal's previous capacity to 50 million tonnes per year of coal at a cost to the state budget of \$724.1 million. This accounts for most of the \$1.0 billion the Queensland government has spent during the analysis period on expanding Abbot Point.

There are plans for the further expansion of the Abbot Point coal port through three new terminals, referred to as T0, T2 and T3. NQBPC spent \$23.6 million in preliminary spending on T2 and T3 between 2011-12 and the current budget year. Terminal 0 and Terminal 3 are primarily designed to provide port capacity for the opening up of coal mining in the Galilee Basin.

### *Galilee Basin*

A significant amount of Queensland government expenditure on minerals and fossil fuel industries is aimed at facilitating the development of the Galilee Basin's coal reserves. The

<sup>13</sup> Lannin S (2010) *QR National float surprises market*

<sup>14</sup> Wiggins J, Cranston M and Thompson S (2012) *Newman's bags \$400m in QR sale*

<sup>15</sup> Quiggin J (2009) *Economists statement on Queensland asset sales*; Quiggin J (2010) *Bad politics makes bad policy: the case of Queensland's asset sales program*

Galilee Basin has large coal deposits, but is located hundreds of kilometres further west and transport requirements have made development economically unviable.

Estimating the assistance already provided to would-be miners in the Galilee is difficult, but further assistance is on offer. Recent undertakings to waive royalties for Galilee Basin miners will further subsidise the development of those deposits and the Abbot Point terminal.<sup>16,17</sup> Consideration of this subsidy is not included in this report.

### *Concessions in the Queensland Budget Papers*

Concessions provide a discount or subsidy for users of particular services, such as discounted public transport for students and senior citizens or discounts on utilities to low income households. Queensland's 2013-14 budget papers adopt a:<sup>18</sup>

*more comprehensive reporting and assessment of the level of Government concessions, and their contribution towards Government priorities, as recommended in the Final Report of the Independent Commission of Audit.*

This more comprehensive approach includes not just concessions on the usual charges that users would pay, but also incorporates the full cost to government of providing these services and the difference between what users pay and the cost to government. The Budget Papers provide the example of public transport:<sup>19</sup>

*Previously, the public transport concession was costed on the basis of where fares for the aged, disabled or low income individuals were less than the standard adult fare. However, this measure does not capture the full subsidy that is provided to public transport users. On average, in 2013-14 it is estimated that the prices passengers pay for public transport in South East Queensland will cover some 26 per cent of the cost of providing the service.*

By incorporating the full cost to government of providing public transport, the new concession statement estimates public transport concessions at over \$1 billion, compared to the former estimate of around \$70 million.<sup>20</sup>

This change introduces new items into the concession statement that relate to the minerals and fossil fuel industries, which also use government services at less than their full cost. The concessions relevant to the minerals and fossil fuel industries are detailed in Table B2 below:

**Table B2: Queensland Concessions Statement items relevant to minerals and fossil fuel industries (\$m)**

Direct concessions	2012-13	2013-14
Rail Network and Infrastructure Funding	503.7	546.9
Gladstone Power Station subsidies <sup>(a)</sup>	233.6	233.6

<sup>16</sup> Heber A (2013) Discount mining royalties on the table for Galilee miners

<sup>17</sup> Queensland Government (2013) 'Ministerial Media Statements' *Plan to develop Galilee Basin unveiled* Premier Campbell Newman and Deputy Premier, Minister for State Development, Infrastructure and Planning Jeff Seeney, 7 November, 2013

<sup>18</sup> Queensland Government (2013) *State Budget 2013-14 Concessions Statement*, pp1.

<sup>19</sup> Queensland Government (2013) *State Budget 2013-14 Concessions Statement*, pp1.

<sup>20</sup> See Queensland Government (2012) *State Budget 2012-13 Appendix B – Concessions Statement*, pp175, estimate obtained by adding Rail Concession Scheme to Other Transport Concessions.

Gladstone Port charges concessions	44.7	47.3
Gladstone Port lease concessions	3.5	3.4
NQ Bulk Ports lease concessions	1.5	1.5
Mining industry training subsidy	0.3	3.0
<b>Queensland concession payments for mining industry activity</b>	<b>787.3</b>	<b>835.7</b>

Source: Queensland State Budget Papers 2012-13 and 2013-14.  
Estimate provided in 2012-13 Budget Paper 2.

The largest relevant item in the Queensland Concession Statement relates to rail network and infrastructure funding. It seems likely that this relates almost wholly to the coal industry, as concessions relating to public transport and agricultural freight are covered in other lines of the concession statement. However, we have categorised these items as only partly related to the minerals and fossil fuel industries as the explanation later in the concession statement includes other users, as shown in Figure B3 below:

**Figure B3: Minerals and fossil fuel industry related rail concessions in Queensland budget papers**

	<b>2012-13 \$ million</b>	<b>2013-14 \$ million</b>
Rail Network and Infrastructure Funding	503.7	546.9

This contract arrangement provides funding to ensure that the State supported rail network is safe, reliable and fit for purpose. The contract also provides funding to Queensland Rail to support major capital projects and related asset strategies. The funding provided via this contract directly benefits customers of the State supported rail network, including both freight and passengers. Without this funding, rail access charges (including public transport fares) would be significantly higher for all users of the rail network.

Source: Queensland State Budget 2013-14 'Concessions Statement', p29

As these concessions have only been reported in the most recent budget papers, values for the rest of the analysis period are unavailable. This is likely to be a source of considerable underestimation in our estimates for all states. If other states adopt a similar approach to Queensland, identification of state government assistance to minerals and fossil fuel industries may become easier.

## Western Australia

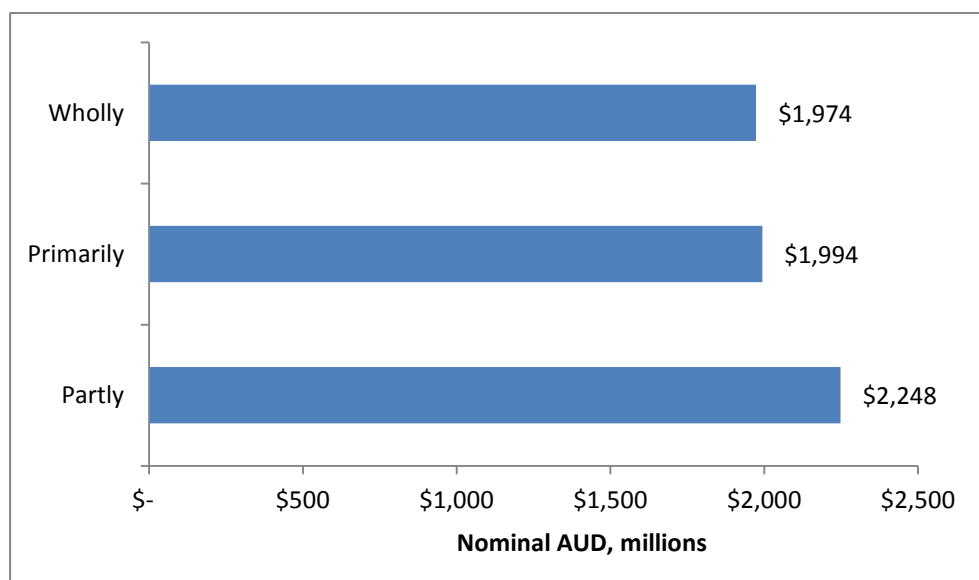
In terms of physical volume of mineral production, Western Australia is the country's biggest mining state and it also spends large amounts of money assisting the minerals and fossil fuel industries. Annual expenditures have been mainly steady over the analysis period, as shown in Table B3 below:

**Table B3: WA expenditures by year (\$ million)**

	<b>2008-09</b>	<b>2009-10</b>	<b>2010-11</b>	<b>2011-12</b>	<b>2012-13</b>	<b>2013-14</b>	<b>Total</b>
Western Australia	1,011.8	1,140.6	831.4	890.9	949.5	1,391.4	6,215.5

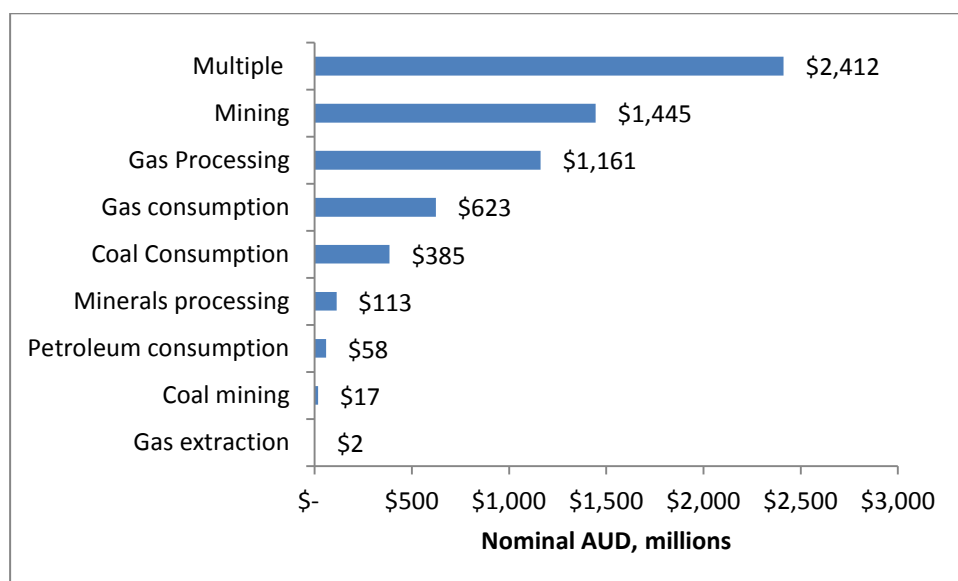
Western Australia's iron ore and gas industries are large in scale and well known. Other minerals are exported and coal is mined for domestic power generation. Western Australia therefore has a greater proportion of multi-user infrastructure relative to Queensland. Much of the West Australian government's assistance of these industries is on items that are categorised as 'partly' or 'primarily' dedicated to these industries. Even so, nearly \$2 billion has been directed to projects wholly devoted to the mineral and fossil fuel industries, particularly gas industry expansion, as shown in Figure B4 below.

**Figure B4: Western Australia spending by level of dedication**



As Western Australia is host to many different segments of the minerals and fossil fuel industries, much spending has been categorised as benefiting multiple sectors, as shown in Figure B5 below:

**Figure B5: Western Australia spending by industry segment**



## WA Key themes and projects

Much of the West Australian government's assistance of the minerals and fossil fuel industries is found in the budget papers under very general-sounding line items, particularly 'Infrastructure for State Development' and 'Industry Development and Investment Facilitation'. The former relates primarily to road infrastructure provision, while the latter benefits a range of projects, primarily in the minerals and fossil fuel industries. State-owned port and electricity generation businesses also account for hundreds of millions of dollars of spending through the analysis period.

### Roads

The largest item identified as spending relevant to the minerals and fossil fuel industries in the West Australian budget papers is a line item entitled 'Infrastructure for State Development', administered by the Commissioner for Main Roads in the Transport Department. Between 2008-09 and 2013-14 this item accounted for \$1.6 billion. The stated objective of the program is:

*... to expand the road network in accordance with Government transport and land use strategies that will facilitate the economic and regional development of the State.<sup>21</sup>*

This spending does not relate to existing road network maintenance, roads aimed for community benefit, works to reduce urban congestion, road safety or traffic management. These are covered in other budget items.

The projects funded under the Infrastructure for State Development umbrella, which are outlined in the budget papers, mainly relate to the minerals and fossil fuel industries. Examples include:<sup>22</sup>

- Works on the Esperance Port access road – Esperance Port is the southern hemisphere's largest exporter of nickel concentrate<sup>23</sup>
- Port Headland road upgrades – Port Headland exported over 280 million tonnes of iron ore in 2012-13<sup>24</sup>
- Bunbury Port Access and Outer Ring roads – Bunbury Port exports mainly alumina and other mineral products as well as woodchips.<sup>25</sup>

Ascertaining to what extent other stakeholders also benefit from these projects is difficult. Due to this uncertainty we have categorised this spending as 'partly' devoted to 'multiple' industry categories.

### Industry Development and Investment Facilitation funding

The second largest item in the West Australian budget papers identified as relevant to the minerals and fossil fuel industries is administered by the Department of State Development. Entitled 'Industry Development and Investment Facilitation', this item accounted for \$411

<sup>21</sup> Government of Western Australia (2009) *Western Australia 2009-10 Budget*, Budget Paper No 2, vol 2: Transport pp.426

<sup>22</sup> These examples are listed in Government of Western Australia (2013) *2013-14 Budget Statements, Budget Paper No 2, Volume 1, Chapter 3*, pp. 388.

<sup>23</sup> Esperance Ports Sea and Land, *About Esperance Ports Sea and Land*

<sup>24</sup> Port Headland Port Authority, *2012-13 Cargo Statistics and Port Information*

<sup>25</sup> Bunbury Port Authority website

million over the analysis period. Projects that received assistance under this item are overwhelmingly related to the minerals and fossil fuel industries. Examples include:<sup>26</sup>

- Chevron Wheatstone project, a large liquefied natural gas project.<sup>27</sup>
- Perdaman Fertilisers project, a proposal to build a fertiliser plant using brown coal as a feedstock.<sup>28</sup>
- Anketell multi-user port, a port proposal to export iron ore from the Pilbara.<sup>29</sup>

As some other industries benefit from parts of this expenditure, it has been categorised as 'primarily' related to 'multiple' industry sectors.

### Ports

In addition to the port projects mentioned above, West Australian government-owned port corporations have spent large amounts on capital works during the analysis period. According to the budget papers, we estimate this capital expenditure at \$764 million, outlined in Table B4 below:

**Table B4: WA port authority capital works**

Port Authority	\$ million
Dampier	85.0
Esperance	94.5
Fremantle	123.7
Geraldton	70.5
Port Hedland	389.8
<b>Total</b>	<b>763.5</b>

At time of writing, the Oakajee Port proposal north of Geraldton was attracting media attention due to controversial claims that sufficient finances had been raised to proceed with the long-proposed iron ore port.<sup>30</sup> While the project looks unlikely to proceed at this stage, through the analysis period the West Australian government spent \$44 million on various expenses relating to the proposal. The government is anticipating spending much more, however, maintaining a \$339 million 'special purpose account' for the project, as shown in Figure B6 below:

<sup>26</sup> These examples from WA State budget papers 2011-12, budget paper 2, volume 1, p116.

<sup>27</sup> Chevron Australia, *Wheatstone Project*

<sup>28</sup> Perdaman Industries, *Collie Urea Manufacturing*

<sup>29</sup> Government of Western Australia, *Anketell Port and Strategic Industrial Area Fact Sheet*

<sup>30</sup> See for example Validakis V (2014) *\$6 billion Oakajee port and rail funding partner revealed*



Figure B6: Oakajee Port Special Purpose Account

Treasury - continued

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	2011-12 Actual \$'000	2012-13 Budget \$'000	2012-13 Estimated Actual \$'000	2013-14 Budget Estimate \$'000	2014-15 Forward Estimate \$'000	2015-16 Forward Estimate \$'000	2016-17 Forward Estimate \$'000
Item 137 – Royalties for Regions <sup>(8)</sup> .....	510,950	563,058	563,058	803,647	733,045	829,636	681,087
Item 138 – WA Health <sup>(9)</sup> .....	18,879	60,146	35,941	51,772	32,416	25,247	67,296
Item 139 – Water Corporation of Western Australia .....	-	9,490	9,490	5,080	-	-	-
Electricity Generation Corporation (Verve Energy) .....	31,321	24,464	24,464	-	-	-	-
Western Australian Land Authority .....	-	-	-	-	-	-	40,000
<i>Other</i>							
Item 140 – Fiona Stanley Hospital Construction Account .....	-	125,000	125,000	15,000	6,500	-	-
Item 141 – New Children's Hospital Account .....	505,000	70,000	70,000	182,000	330,000	69,500	-
Item 142 – New Perth Stadium Account .....	-	100,000	100,000	15,000	135,000	430,000	490,000
Oakajee Port Special Purpose Account .....	-	-	-	-	-	339,000	-
Perry Lakes Trust Account .....	2,775	2,086	1,000	-	-	-	-
Western Australian Future Fund <sup>(10)</sup> .....	-	-	-	-	-	-	69,100

Source: WA Budget papers 2013-14, budget paper number 2, volume 1, p335

This expenditure is still in the forward estimates of the budget, so it has not been included in our analysis. The \$44 million already spent has been categorised as wholly dedicated to the mining industry.

### Electricity generation

Through the analysis period, most of Western Australia's electricity was generated by the state-owned Verve Energy. Verve invested heavily in fossil fuel energy through this time, spending \$1 billion on new and retro-fitting capital assets. In the current budget:<sup>31</sup>

*An allocation of \$287.3 million has been made for works on Verve Energy's fossil fuel plant portfolio and supporting infrastructure.*

While Verve's sustainable energy investment consists of:

*An allocation of \$2.1 million ... mainly for a power station upgrade at Denham.*

This is shown in more detail in Figure B7 below:

<sup>31</sup> WA State Budget Papers 2013-14, Budget paper 2, ch3, vol2, p751,  
[http://www.treasury.wa.gov.au/cms/uploadedFiles/State\\_Budget/Budget\\_2013\\_14/bp2\\_chpt\\_3v2.pdf?n=1372](http://www.treasury.wa.gov.au/cms/uploadedFiles/State_Budget/Budget_2013_14/bp2_chpt_3v2.pdf?n=1372)



Figure B7: WA Verve Energy Asset Investment Program

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VERVE ENERGY
<b>ASSET INVESTMENT PROGRAM</b>
The primary functions of Verve Energy are to generate and supply electricity in the South West Interconnected System (SWIS) region. It currently owns a portfolio of thermal generating stations and gas turbines utilising coal, gas and liquids as fuel sources, as well as interests in wind farms and photovoltaic generating systems. In addition, Verve Energy has Power Purchase Agreements with a number of independent power producers.
Over the Budget and forward estimates period Verve Energy will spend \$289.4 million on its Asset Investment Program.
<b>Generation</b>
An allocation of \$287.3 million has been made for works on Verve Energy's fossil fuel plant portfolio and supporting infrastructure. Major items within this total include:
<ul style="list-style-type: none"> <li>• \$128.8 million at Muja CD Power Station for various works to support reliability, efficiency and environmental targets. Major works include: \$19.6 million at Stages C and D to accommodate two shifting and low load requirements including the installation of modern governor systems; \$5.5 million for a precipitator performance upgrade at Stages C and D; \$5.5 million for a condensate polisher plant upgrade at Stage C; and \$5 million for generator stator rewinds at Stage C that are nearing the end of their technical life;</li> <li>• \$48.1 million to improve gas turbine reliability and security of supply. Key works include: \$22 million for strategic spares at the Cockburn Gas Turbine; \$9.5 million for the installation of a bypass stack and other works on the Worsley Gas Turbine; and \$6.5 million for a speedtronics upgrade on the Pinjar Gas Turbines; and</li> <li>• \$36 million provision for boiler repairs and other works at Muja AB Power Station pending review and final government decision.</li> </ul>
<b>Sustainable Energy</b>
An allocation of \$2.1 million has been made, mainly for a power station upgrade at Denham.

Source: WA State Budget Papers 2013-14, Budget Paper 2, ch3, vol 2, p 751,

Note that in 2013 Verve merged with state-owned energy retailer, Synergy. The merged body is now called Synergy.

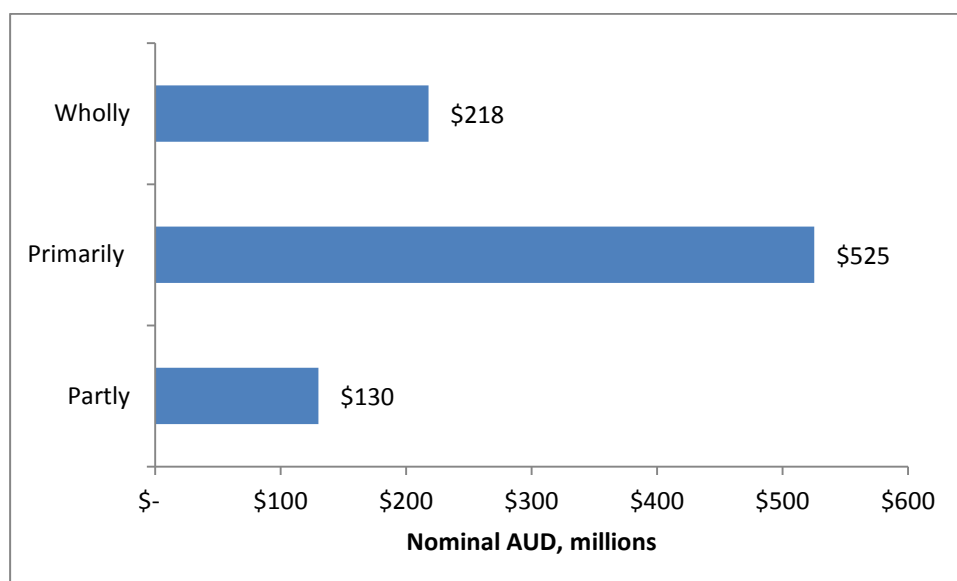
## New South Wales

New South Wales is a major coal producer. The state also has several smelters and mineral processing operations. There are also proposals to develop gas production in the state. As shown in Table B5 below, the New South Wales government has spent \$872 million on capital and administered assistance to the selected industries over the 2008-09 to 2013-14 budget period.

**Table B5: New South Wales state expenditures by year (\$ million)**

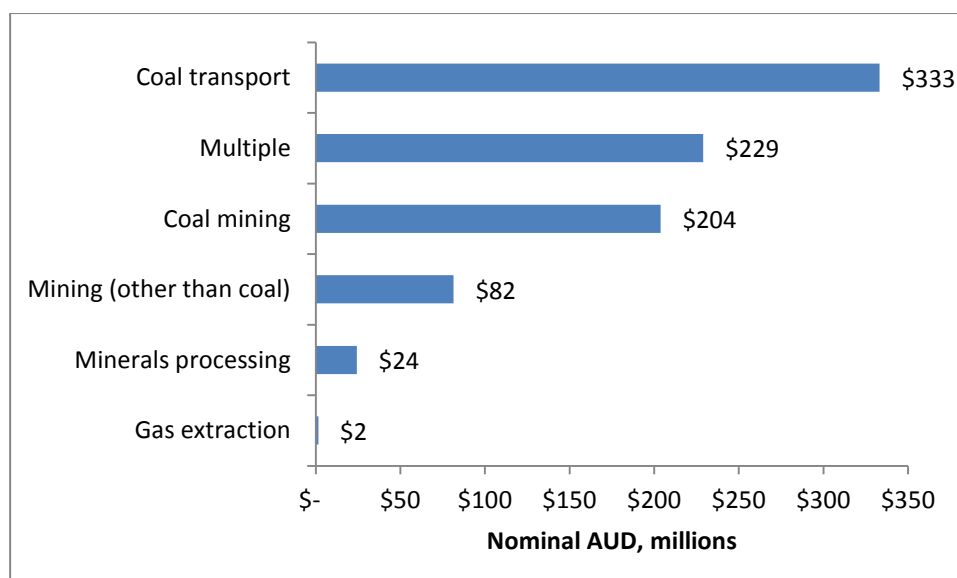
	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Total
New South Wales	235.3	166.1	97.6	157.3	80.1	136.4	872.8

The bulk of New South Wales spending on these industries has been categorised as 'primarily' dedicated to their assistance, as shown in Figure B8 below:

**Figure B8: New South Wales spending by level of dedication**

Around half of the ‘primarily’ dedicated expenditure relates to capital expenditures by the Port of Newcastle Corporation – \$228 million. Although 95 per cent of the port’s cargo is coal, this expenditure was categorised as ‘primarily’ because small quantities of non-minerals and non-fossil fuel commodities also pass through the port.<sup>32</sup>

Coal-related industry segments dominate assistance to the minerals and fossil fuel industries in New South Wales. Coal transport is the largest, as shown in Figure B9 below, again relating to capital expenditure on Newcastle Port as well as some rail-related projects:

**Figure B9: New South Wales spending by industry segment**

Coal transport is also heavily present in the ‘multiple’ category. Of this, \$229 million is capital expenditure by the Port Kembla Port Corporation, where coal exports account for around half of the tonnage moving through the port. Coal mining assistance consists mainly of subsidies

<sup>32</sup> Newcastle Port Corporation, *Trade Statistics*

for ‘clean coal’ research, funding the state-owned Cobbora Coal project and direct assistance to mines in the Gunnedah and Western Coalfields.

## New South Wales – Key themes and projects

### *Ports*

Much state government spending assisting the minerals and fossil fuel industries through the analysis period was capital expenditure on ports in Newcastle and Port Kembla near Wollongong.

Port Kembla was privatised in 2013 for a price of \$760 million.<sup>33</sup> The price received for the privatisation was well received in the media, but there was little discussion of the amount of money that had been put into the port in the years leading up to the sale. It is beyond the scope of this paper to assess the net gain or loss to the stakeholders of this transaction, but New South Wales taxpayers should be aware of the considerable capital expenditure that has gone into the port – \$229 million during the analysis period alone.

More recently the Port of Newcastle has been privatised for \$1.75 billion. Similarly, while the deal is being described as ‘momentous’ by the New South Wales government, there is no discussion of the \$228 million in capital spending over the last six budget periods.<sup>34</sup>

### *‘Clean coal’ research*

Through the analysis period, the New South Wales government has spent \$87.5 million on the Clean Coal Fund, later renamed Coal Innovation New South Wales. The budget papers repeatedly state that this is a \$100 million project, although only \$87.5 million is evident from the budget papers. The difference may be explained through the government’s funding of the Australian Coal Association Low Emissions Technologies project relating to the Delta Carbon Capture and Storage project. It is not clear from the budget papers to what extent this project is funded by government or from the Clean Coal Fund, as shown in Figure B10 below:

<sup>33</sup> Nicholls S (2013) *Port leases garner \$5 billion windfall for state government*

<sup>34</sup> Wiggins J (2014) *Port of Newcastle leased to Hastings in \$1.75 billion deal*

**Figure B10: Coal funding in New South Wales state budget 2010-11**

### **Mineral Resources and Mine Safety**

Significant 2009-10 achievements and developments are:

- ◆ managing the Government's four-year, \$100 million Clean Coal Fund supported by the Clean Coal Council
- ◆ implementing a joint funding agreement with the Australian Government and ACALET Ltd for the Delta Carbon Capture and Storage project, valued at \$28.3 million
- ◆ continuing the Government's support for increased mineral and petroleum exploration under the New Frontiers initiative, and the awarding of exploration licences for a number of coal release areas and
- ◆ implementing the Government's jobs stimulus package for the Western and Gunnedah coalfields.

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Budget Estimates 2010-11

7 - 7

Source: NSW 2010-11 Budget Paper 3, Industry and Investment Cluster, p7-7

Confusingly, elsewhere in the same budget paper we are told of:<sup>35</sup>

*\$21.5 million for the development of clean coal technology through the Clean Coal Fund, including through a carbon capture and storage demonstration project.*

Our analysis includes both items found in the budget paper, which may result some double counting.

Any double counting on this front would, however, be easily outweighed by the loss to the New South Wales government relating to the treatment of the Coal Research Levy. This levy for \$0.05 per tonne of coal mined is fully deductible from royalties that coal miners pay to the New South Wales government for the rights to mine the state's coal. This deduction is effectively a subsidy of millions of dollars per year from the New South Wales government to the Australian Coal Association Research Program.<sup>36</sup> Other royalty deductions relate to:

- Coal processing expenses
- Mine subsidence levy
- Mines rescue levy
- Commonwealth levy for long service leave
- Insurance
- Bad debts

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<sup>35</sup> 2010-11 budget paper 3, Industry and Investment Cluster, p7-14

<sup>36</sup> Australian Coal Association Low Emissions Technology website

All these levies are a cost to New South Wales taxpayers because they result in less royalties being collected. Estimating how much these deductions cost is beyond the scope of this paper and no figures are included in our analysis.<sup>37</sup> Many of these deductions were signed into law by corrupt former mining minister, Ian Macdonald, on 31 December 2008.<sup>38</sup>

### *Cobbora Coal Project*

The Cobbora Coal project is a New South Wales state government-owned coal project, the only government-owned coal project in New South Wales. The project was originally proposed to supply below-market-price coal to state-owned power generation assets. It had the endorsement of corrupt former minister, Ian Macdonald:

*“This is about future [coal-] power generation for this State ... we are preparing for the future and make no apologies for doing so”<sup>39</sup>*

The economic rationale for the project has always been under question, however, and New South Wales Treasury recently stated:

*The final feasibility study for the Cobbora coal mine has confirmed that around \$1.5 billion of capital expenditure is required to develop the Cobbora coal mine until it produces first coal. Forecast cash flows are insufficient to cover subsequent capital and operating expenditure over the life of the mine. The total loss to the Government, if arrangements are unchanged, would be in excess of \$1.5 billion.<sup>40</sup>*

This certain economic loss has caused the New South Wales government to withdraw from the original proposal to own and operate the mine, but it is still persisting with efforts to have the project approved for potential sale or lease. Through the analysis period, \$76 million was spent on the project's feasibility studies. Ongoing operating losses of the Cobbora Holding Company are not included in our analysis as they do not appear in identifiable form in the budget papers and our analysis is limited to examining spending on capital investments of government-owned businesses rather than ongoing operations. It is worth noting, however, that the Cobbora Holding Company runs at an annual loss of around \$6 million.<sup>41</sup>

### *Gunnedah and Western Coalfields subsidies*

In 2009, followed lobbying from the New South Wales Minerals Council and the Construction, Forestry, Mining and Energy Union, \$20 million dollars was budgeted for direct payments to coal mine operators in the Gunnedah and Western Coalfields. Most of this subsidy seems to have gone to Centennial Coal.<sup>42</sup> The project had the strong endorsement of corrupt former mining minister, Ian Macdonald:

*As a result of the current prices, some otherwise viable mines have become marginal propositions and thereby threaten the security of jobs in these regional areas. Now more than ever it is essential to sustain our important mining industry, which provides thousands of jobs to rural communities.<sup>43</sup>*

<sup>37</sup> NSW DII (2008) *NSW Coal Mining Guidelines for Royalty Compliance*

<sup>38</sup> Macdonald I (2008) *Mining Act 1992 – determination under section 283* (5)

<sup>39</sup> Daily Liberal, *Cobbora mine to light up NSW* (2009)

<sup>40</sup> NSW Treasury (2013) *NSW Budget Papers 2013-14, Chapter 9: Public* p11

<sup>41</sup> NSW Auditor General (2012) *Report to Parliament, Volume 4, Cobbora Holding Company Pty Limited*

<sup>42</sup> Cubby B and Moore M (2009) *Coal group to reap millions from budget*

<sup>43</sup> NSW Legislative Assembly (2009) *Hansard, Questions Without Notice: Mining Infrastructure and Jobs*

As shown in Figure B11 below, \$20 million over two years was budgeted for this program. However, in the 2011-12 budget papers no reference is made estimated actual spending so our analysis includes only the \$10 million definitely spent.

**Figure B11: Assistance Package for the Western and Gunnedah Coalfields**

DEPARTMENT OF INDUSTRY AND INVESTMENT			
SERVICE GROUP STATEMENTS (CONT)			
Investment Attraction and Industry Development (cont)			
	2009-10		2010-11
	Budget	Revised	Budget
	\$000	\$000	\$000
<u>Financial Indicators:</u>			
Total Expenses Excluding Losses	87,789	84,739	129,838
Total expenses include the following:			
Employee related	13,340	14,131	16,162
Other operating expenses	4,405	5,675	3,781
Grants and subsidies:	21,568	21,568	18,375
New South Wales Film and Television Office grant	13,824	13,824	8,416
Other expenses:	48,084	42,973	91,095
Assistance to industries	22,148	23,683	35,727
Assistance package for the Western and Gunnedah Coalfields	10,000	10,000	10,000
Major Investment Attraction Scheme	10,000	4,000	40,000
Total Retained Revenue	1,150	2,406	1,687
NET COST OF SERVICES	86,639	82,333	128,151
CAPITAL EXPENDITURE	179	179	113

Source: NSW Budget Papers 2010-11, Budget Paper 3, Chapter 7, Industry Cluster, p7-32

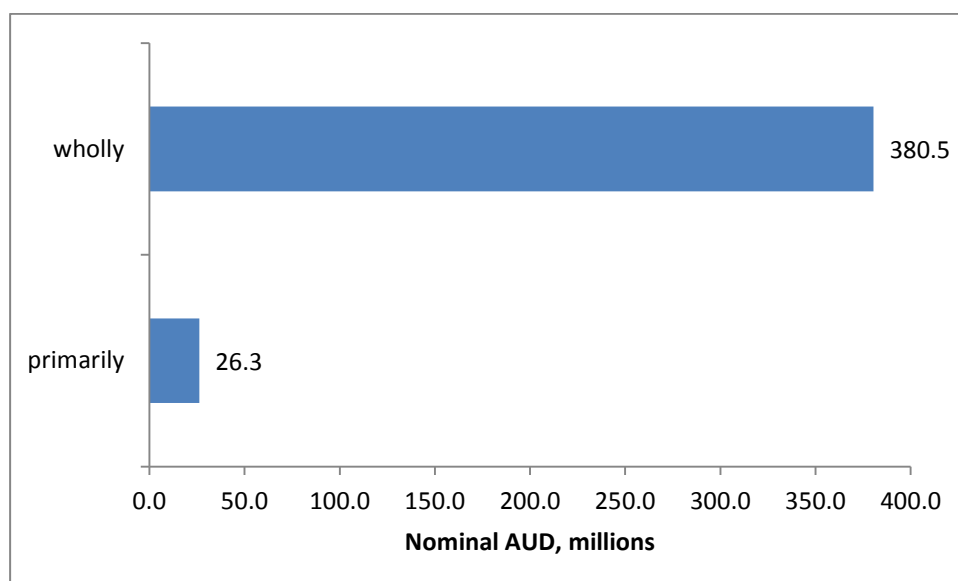
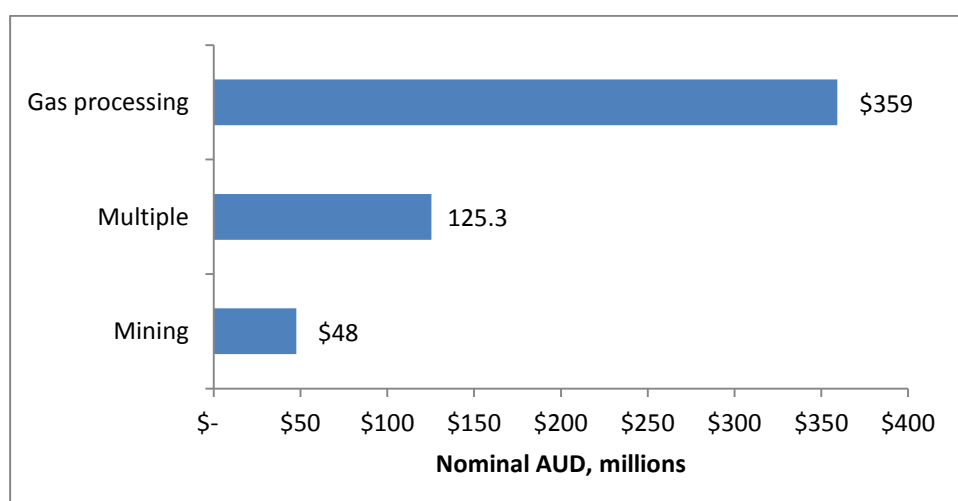
## Northern Territory

The Northern Territory has a range of mining and mineral processing operations. The major factor behind the increase in mining-related capital expenditure over the period is major gas projects in the Arafura Sea. Through this period the Northern Territory government has spent over \$400 million on the minerals and fossil fuel industries, as shown in Table B6 below.

**Table B6: NT government minerals and fossil fuel expenditures by year (\$ million)**

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Total
Northern Territory	54.1	75.0	60.5	67.4	62.0	87.6	406.7

Most of the Northern Territory government's expenditure on minerals and fossil fuel industries relates to port development and an industry assistance program. The vast majority of this expenditure has been categorised as wholly dedicated to these industries, with the gas processing industry the major recipient, as shown in Figure B12 and Figure B13 below:

**Figure B12: Northern Territory spending by level of dedication****Figure B13: Northern Territory spending by industry segment**

## Northern Territory – Key themes and projects

### *Resource Industry Development*

The Northern Territory government's Resource Industry Development program aims for the:<sup>44</sup>

*Provision of quality services, information and advice to national and international stakeholders to support exploration and development of the Territory's mineral and energy resources.*

It consists of a geological survey division and more general industry development section. Over the analysis period, budget papers outline \$125 million spent on this program. An example from the 2013-14 Budget, which shows \$11.7 million budgeted for the current year is shown in Figure B14 below:

<sup>44</sup> NT 2013-14 Budget Paper number 3, p238



## Figure B14: Northern Territory Resource Industry Development

### Output Group: Resource Industry Development

**Outcome:** Provision of quality services, information and advice to national and international stakeholders to support exploration and development of the Territory's mineral and energy resources.

Output Group/Output	2012-13 Mini Budget	2012-13 Estimate	2013-14 Budget
<b>Resource Industry Development</b>	<b>\$000</b>	<b>\$000</b>	<b>\$000</b>
Northern Territory Geological Survey	8 799	9 074	10 756
Industry Development	1 063	1 546	930

#### Key Variations

The increase for the Northern Territory Geological Survey output mainly relates to additional funding to support geoscience exploration programs.

The decrease for the Industry Development output mainly relates to one-off revenue in 2012-13 for the Australia China Minerals Investment Summit to be held in Darwin and the completion of the Renewable Remote Power Generation Program in 2012-13.

### Northern Territory Geological Survey

Collection, distribution and marketing of geological information and products.

Key Deliverables	2012-13 Mini Budget	2012-13 Estimate	2013-14 Budget
New geospatial data sets and publications distributed to clients <sup>1</sup>			6 000
Geoscientific data products developed or updated <sup>1</sup>			65
Industry delegates at Annual Geoscience Exploration Seminar	230	210	210
Target rating for geological database in FIAS <sup>2</sup>	10 <sup>th</sup>	12 <sup>th</sup>	10 <sup>th</sup>
Information and product request responses within five days <sup>3</sup>	90%	90%	90%
Products and industry reports distributed online <sup>4</sup>		47%	50%

<sup>1</sup> Revised measure; not comparable to previous years.

<sup>2</sup> Fraser Institute Annual Survey (FIAS) assists governments to reform business environments via investment generation through a range of services including client satisfaction measures.

<sup>3</sup> Agreed timeframes amended to five days.

<sup>4</sup> New measure reflecting revised business practices.

Department of Mines and Energy

### Industry Development

Promotion activities to attract investment into greenfields exploration, and minerals and energy projects.

Key Deliverables	2012-13 Mini Budget	2012-13 Estimate	2013-14 Budget
Overseas investment attraction missions and seminars	4	2	2
International investment attraction events held domestically	2	2	2
New prospective international investment introductions made for NT projects <sup>1</sup>			150

<sup>1</sup> New measure.

Source: 2013-14 Budget Paper 3 (pp. 238–9)

It is important to note that this program is separate from the Northern Territory's Resource Industry Management group, which administers the industry-monitoring regulations and environmental compliance. The activities of this group have not been included in the analysis as their activities relate to management of the minerals and fossil fuel industries rather than assistance through provision of services and promotion.

### Port and related infrastructure

Through the analysis period, \$238 million was spent on capital works relating to port facilities by the Darwin Port Corporation and the Land Development Corporation. These works mainly aim to facilitate the export of gas and some mineral products. Examples include:



- Marine Supply Base to service the offshore oil and gas industry – forecast to cost over \$100m, the project is still under construction, with \$83 million already spent
- East Arm bulk load facility, which connects iron ore storages via 2.5 kilometre conveyor to loading facilities – the project cost \$40.9 million over the 2008-09 to 2011-12 budget periods.

## South Australia

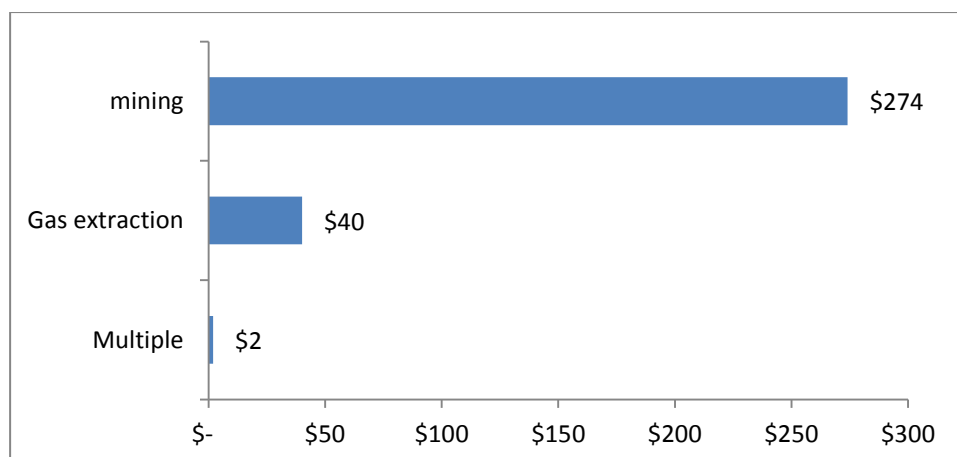
South Australia hosts a range of minerals and fossil fuel projects. Some of the best known include the Olympic Dam mine owned by BHP Billiton, which produces copper, gold, silver and uranium and the Moomba gas fields, owned by Santos. South Australia's government provided over \$300 million of assistance to the minerals and fossil fuel industries during the analysis period, as shown in Table B7 below:

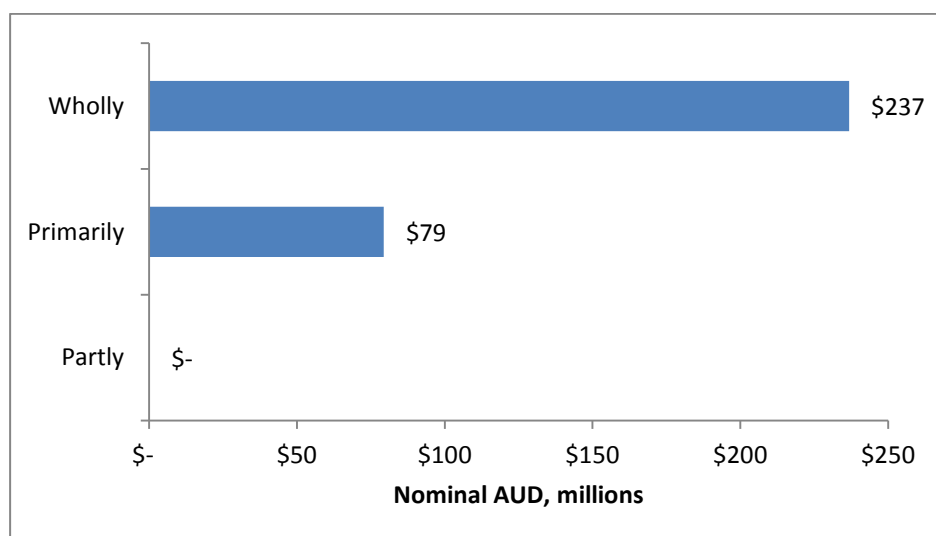
**Table B7: South Australian government expenditure by year (\$ million)**

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Total
South Australia	20.0	35.6	44.4	65.1	80.6	70.6	316.2

The bulk of expenditures on minerals and fossil fuel industries in the South Australian budget papers are directed at the mining (other than coal) sector, with some also aimed at developing gas extraction. Most of these are wholly directed at these industries, as shown in Figure B15 and Figure B16 below:

**Figure B15: South Australia spending by industry segment**



**Figure B16: South Australia spending by level of dedication**

### South Australia – Key themes and projects

Unlike most other states, much of South Australia's spending on the minerals and fossil fuel industries identified in the budget papers is on administered programs rather than capital investment. The state government has programs dedicated to assisting both minerals and energy sectors. Items of capital investment relate to roads and ports. Another item relates to ongoing cleanup costs for the abandoned Brukunga Mine.

#### *Minerals and Energy Resources Programs*

Two programs administered under South Australia's Department for Manufacturing, Innovation, Trade, Resources and Energy are devoted to assisting the minerals and fossil fuel industries. Referred to in budget papers as the Mineral Resources program and the Energy Resources program, they aim to assist these industries rather than to regulate and monitor them, so they have been included in our analysis. Over the analysis period they received funding of \$189 million (minerals) and \$37 million (energy). Some of their recent achievements are outlined in Figure B17 and Figure B18 below. Note that PACE stands for Plan for Accelerating Exploration.

### Figure B17: Highlights of South Australia's Mineral Resources program

#### Highlights 2012–13

- South Australia's mineral exploration expenditure for the 2012 calendar year was \$311.6 million, substantially exceeding South Australia's Strategic Plan Target of \$200 million per annum.
- Delivered PACE 2020 year three outcomes with the full implementation of PACE Exploration, PACE Mining, PACE Energy and PACE Global programs, including initiating round seven of PACE Discovery Drilling with industry and the launch of online tracking for Exploration Licence Applications through the South Australian Resources Information Geoserver (SARIG 2020).
- Contributed to the continued growth of South Australia's mining industry through dedicated case management of approvals for:
  - a retention lease for the Carrapateena copper-gold project
  - new mining operations at Arrium's Iron Monarch iron ore mine
  - the major project approval for stage 1 of the Centrex Metals Port Spencer bulk minerals export port development
  - the \$200 million expansion of Arrium's port facilities at Whyalla, increasing capacity from 6 million tons per annum to 13 million tons per annum.
- Endorsed recommendations of the Resources Energy Sector Infrastructure Council (RESIC) and progressed the development of the infrastructure channel.
- Significant involvement in the delivery of consultation reports for three regional mining and infrastructure plans underpinned by the 2011 RESIC Infrastructure Demand Study.
- Commenced a major targeted geoscience survey program around the Woomera Prohibited Area that will stimulate the next generation of world-class mine discoveries.

Source: South Australia 2013-14 Budget *Agency Statements*, Vol 3. *Manufacturing, Innovation, Trade, Resources and Energy – Program 2 Mineral Resources* p. 116

### Figure B18: Highlights of South Australia's Energy Resources program

#### Highlights 2012–13

- Published the Roadmap for Unconventional Gas in South Australia.
- Conducted a roundtable workshop to bolster the implementation of recommendations in the Roadmap for Unconventional Gas in South Australia.
- Led the development of leading practice national regulatory frameworks to get leverage for petroleum, geothermal and gas storage projects in South Australia.
- Offered acreage in the Otway and Cooper-Eromanga Basins for competitive work program bids.

- Sustained national leadership in geothermal energy investment by facilitating Geodynamics' and Petratherm's Renewable Energy Demonstration Program projects.
- Updated and remade Petroleum and Geothermal Energy Regulations 2013.

#### Targets 2013–14

- Implement recommendations in the Roadmap for Unconventional Gas.
- Ensure efficient regulation administration, including co-regulatory agencies.
- Lead the development of leading practice national regulatory frameworks for unconventional gas to get leverage for South Australian projects.

Source: South Australia 2013-14 Budget Agency Statements, Vol 3. Manufacturing, Innovation, Trade, Resources and Energy – Program 2 Mineral Resources p. 118-119.

#### *Capital works*

The main capital works identified as relevant to the minerals and fossil fuel industries in the South Australian budget papers are the Port Bonython Jetty Refurbishment and an upgrade of the Port Augusta to Olympic Dam road.

Port Bonython is near Whyalla, at the northern end of Spencer Gulf, and services mainly gas projects, with refurbishments aimed at also assisting minerals projects. Over the analysis period, budget papers list \$23.9 million of expenditure on the project.

Over the analysis period \$19 million was allocated to upgrade the road connection between Port Augusta and the Olympic Dam mine. This is would primarily benefit the mine operators as the project currently requires about one million tonnes of supplies to be transported every year, a load moved primarily by road.<sup>45</sup> There are also proposals to expand the Olympic Dam operation, although these have recently been postponed pending 'technological breakthrough'.<sup>46</sup> Any further expansion would further increase the need for road transport and use of this road infrastructure.

#### *Brukunga mine remediation*

The Brukunga mine in the Adelaide Hills mined pyrite minerals from 1955 to 1972. Since then the site has been contaminating local water resources due to poor closure practices.<sup>47</sup>

Ongoing state expenditure at the site of the Brukunga pyrite mine east of Adelaide has totalled \$21.1 million over the period – with further remedial works on weir construction and control of acid seepage expected to continue into the future. The state's current expenditure program for the site has an estimated total cost of \$17.1 million and runs into the 2014-15 budget year, as shown in Figure B19 below:

<sup>45</sup> BHP Billiton, *Olympic Dam Expansion EIS: Materials Handling and Transport*

<sup>46</sup> Heber A (2013) *Olympic Dam expansion too much of a challenge for BHP*

<sup>47</sup> Department of Manufacturing, Innovation, Trade, Resources and Energy, *Brukunga mine site*

**Figure B19: Brukunga mine in South Australia budget papers**

	Expected completion	Proposed expenditure 2013–14 \$000	Estimated total cost \$000
<b>Department for Manufacturing, Innovation, Trade, Resources and Energy</b>			
<b>Existing Projects</b>			
<b>Brukunga Mine</b>	Jun Qtr 2015	13 662	17 074
The construction of weirs above and below the mine site to divert the creek and increase the capacity of the treatment plant has been completed. The next stage of work will focus on long-term control of acid seepage from the rock dumps and progressive rehabilitation of the mine site.			

Source: SA Budget Papers 2013-14, Budget Paper 5 Capital Investment Statement, Chapter 2, p36.

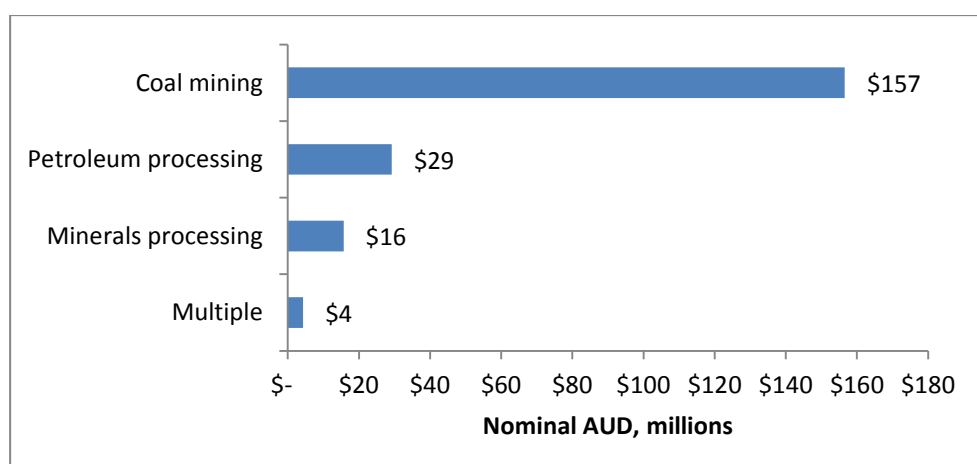
## Victoria

Victoria's mining operations are primarily directed at domestic power generation – the state's mineral processing industries have been facing challenges in recent years. The state is investing heavily in efforts to develop carbon capture and storage due to its large deposits and heavy use of carbon-intensive brown coal. State assistance to the minerals and fossil fuel industries runs into the tens of millions of dollars each year, as shown in Table B8 below:

**Table B8: Victorian assistance by year (\$ million)**

	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Total
Victoria	22.0	31.6	35.3	38.9	42.5	35.5	205.7

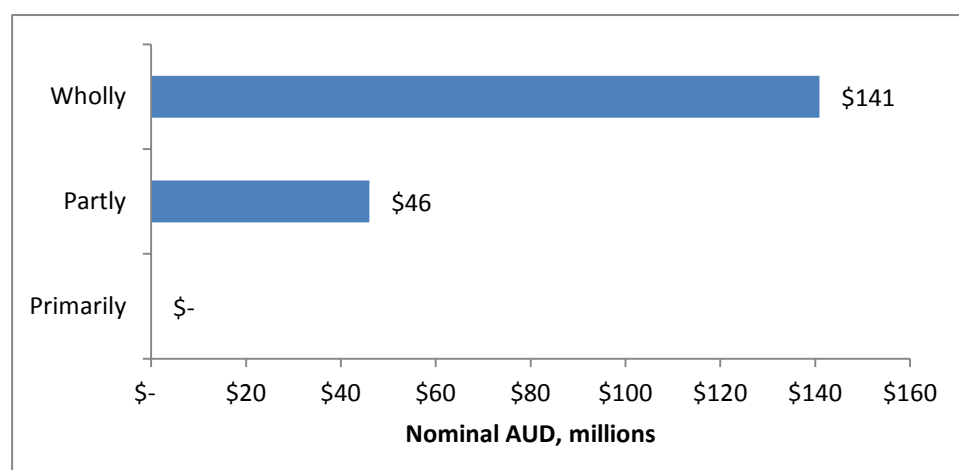
Victoria exports relatively few products from its minerals and fossil fuel sectors. Relative to other states, there has been little need for capital investment in railways, roads and ports. Instead, the Victorian government channels most of its assistance through carbon capture and storage programs, which have been categorised as assisting the coal mining industry and account for the bulk of expenditure shown in Figure B20 below:

**Figure B20: Victorian spending by industry segment**



Some products, such as refined petroleum or aluminium, are unearthed in other areas and further refined in Victoria. These sectors have faced challenges in recent years as overseas competitors have emerged and the Australian dollar has been high. One of the major items identified as being relevant to the minerals and fossil fuel industries is the construction of a water recycling plant for the Shell refinery near Geelong. This \$29 million project accounts for all of the assistance to the petroleum processing sector in the above table, and the bulk of the 'partly' dedicated category shown in Figure B21 below:

**Figure B21: Victorian spending by level of dedication**



## Victoria – key themes and projects

Most of Victoria's assistance to the minerals and fossil fuel industries relates to administered programs to promote 'clean coal'. Our estimates are almost certain to understate Victoria's assistance to these industries, because much of the expenditure cannot be clearly identified from the budget papers. For example, the Department of State Development, Business and Innovation's Energy and Resources section has a budget of \$188 million in 2013-14. The vast bulk of its performance measures relate to the minerals and fossil fuel sector, even though it also has responsibility for renewable energy programs.<sup>48</sup>

As Victoria has little in the way of railway, road or port spending related to the minerals and fossil fuel industries, most capital spending is on water-related infrastructure.

### Clean Coal

The Victorian government budgeted at least \$135 million to subsidise clean coal research over the assessment period. Most of this money was allocated to subsidising research and the development of carbon capture and storage. Despite more than \$100 million and six years, the main project is still in the very early stages of development according to its webpage, last updated in February 2014:

*CarbonNet is at feasibility and commercial definition stage. During this stage CarbonNet is continuing evaluation of potential storage sites with the aim of selecting one or two sites for high grade detailed mapping to determine the optimum locations for the safe, long term storage of CO<sub>2</sub>.<sup>49</sup>*

<sup>48</sup> See Victorian budget papers 2013-14, budget paper 3, p234-237.

<sup>49</sup> Department of State Development, Business and Innovation, *Why we need the CarbonNet Project*

In addition to this project, the Victorian government funds Clean Coal Victoria, budgeted at around \$2.5 million per year, and has contributed \$45 million to the Advanced Lignite Demonstration Program. It also runs Brown Coal Innovation Australia and the coal-oriented Energy technology Innovation Strategy.<sup>50</sup> Establishing exactly how much was spent on these projects, and in what years, is difficult – for the bulk of the analysis period they were administered by the Department of Primary Industries and reported as part of the ‘Primary Industries Policy’ line item and not recorded separately from other policies, as shown in Figure B22 below:

**Figure B22: Victorian ‘clean coal’ funding in Department of Primary Industries**

(\$ million)				
	2010-11 Budget	2010-11 Revised	2011-12 Budget	Variation <sup>(a)</sup> %
Primary Industries Policy <sup>(b)</sup>	66.9	63.9	83.9	25.4
Regulation and Compliance <sup>(c)</sup>	116.2	155.2	111.3	-4.2
Strategic and Applied Scientific Research <sup>(d)(e)</sup>	208.1	227.5	254.0	22.1
Sustainable Practice Change <sup>(f)</sup>	119.7	125.4	81.5	-31.9
<b>Total <sup>(g)</sup></b>	<b>510.9</b>	<b>572.0</b>	<b>530.7</b>	<b>3.9</b>

Source: Department of Primary Industries

Notes:

(a) Variation between 2010-11 Budget and 2011-12 Budget.

(b) The 2011-12 output cost is higher than the 2010-11 output cost due to additional funding received for CarbonNet to explore the development of an integrated network to capture and transport carbon to storage sites.

Source: Victorian 2011-12 Budget Papers, Budget Paper 3, chapter 1, p295

Note the footnote (b), in Figure B22, which applies to Primary Industries Policy, reproduced below for clarity:

*The 2011-12 output cost is higher than the 2010-11 output cost due to additional funding received for CarbonNet to explore the development of an integrated network to capture and transport carbon to storage sites*

From 2013-14 responsibility for these programs has been moved to the Department of State Development, Business and Innovation, which has begun reporting some of these items separately.

The Victorian government has been considerably more generous to funding ‘clean coal’ than it has been in funding renewable energy, which received only \$74 million over this period, as shown in Figure B23 below:

<sup>50</sup> Department of State Development, Business and Innovation, *Government has a role*

**Figure B23: Victorian 2008-09 budget sustainable energy and ‘clean coal’**

### ***Leading on sustainable energy technologies***

Achieving the Victorian Government’s objective to reduce greenhouse gas emissions by 60 per cent of 2000 levels by 2050 will require more than just cuts to current fossil fuel emission levels. It will also require the development of a range of low emission sustainable energy technologies. The 2008-09 Budget provides \$74 million over six years, aimed at stimulating new sustainable energy technologies. The key initiative provides \$72 million over six years to support large scale, pre-commercialisation demonstration of sustainable energy technologies, such as solar energy storage, biofuels, biomass conversion, geothermal energy efficiency and clean distributed energy.

Funding has also been provided for an enhanced Sustainable Transport Energy policy capability and to explore options for promoting the uptake of low emission transport fuels and vehicles in Victoria.

### ***Positioning Victoria as a Carbon Capture and Storage leader***

Victoria’s brown coal resources in the Latrobe Valley are amongst the largest in the world and produce around 85 per cent of the electricity used by Victorians every year. To ensure that Victoria is able to reduce emissions in a carbon constrained environment, the 2008-09 Budget commits \$132 million over six years to the development of Carbon Capture and Storage (CCS) technologies and for coal related industries. The initiatives will drive innovation in technology, practice and skills development and deliver significant investment in the state’s energy regions. Specific initiatives include:

Source: Victorian Budget Papers 2008-09, Budget Paper 3, Chapter 1, p28

### ***Water infrastructure***

Water projects identified in the budget papers as relating to the minerals and fossil fuel industries consist of a large project near Geelong, the Geelong-Shell Water Recycling Project and a series of smaller projects in the Latrobe Valley which relate to the area’s coal mines and power plants.

Between 2009-10 and 2012-13 the Victorian government, through Barwon Water, spent \$29.2 on the Geelong-Shell Water Recycling Project. The project will supply the Shell refinery with 1,817 megalitres of water per year, reducing its need to use domestic water supply. The project will also provide water for community use. Shell and the Australian government also contributed to the project.<sup>51</sup>

A series of small water infrastructure projects and upgrades in the Latrobe Valley were classified as partly benefiting the coal mining industry in that region. As these projects are major users of water in the Latrobe Valley, they benefit from upgrades to network infrastructure. The value of these projects in the budget papers was \$20.0 million over the analysis period.

<sup>51</sup> Department of the Environment, *Geelong-Shell Water Recycling Project (also known as the Northern Water Plant)*



## Tasmania

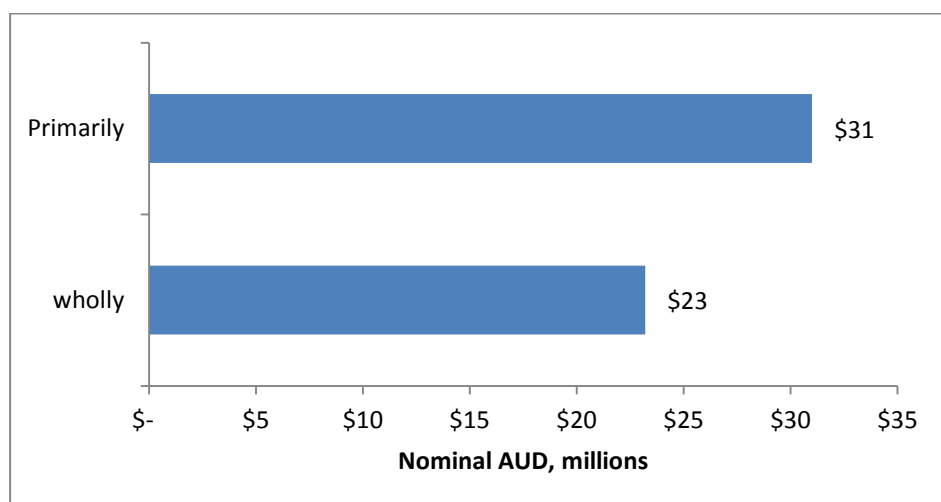
Tasmania has a number of operating mines and there have been recent proposals to begin new projects, including in environmentally sensitive areas such as the Tarkine in the north-west of the island. The state also has a long-established minerals processing industry, with several smelters operating, particularly around Bell Bay near Launceston. These operations benefit from discounted electricity from the state-owned Hydro Tasmania, but this discount is not easily identified in the budget papers. Other measures which are outlined in the budget papers as assisting the minerals and fossil fuel industries are totalled in Table B10 below:

**Table B10: Tasmania – expenditure by year (\$ million)**

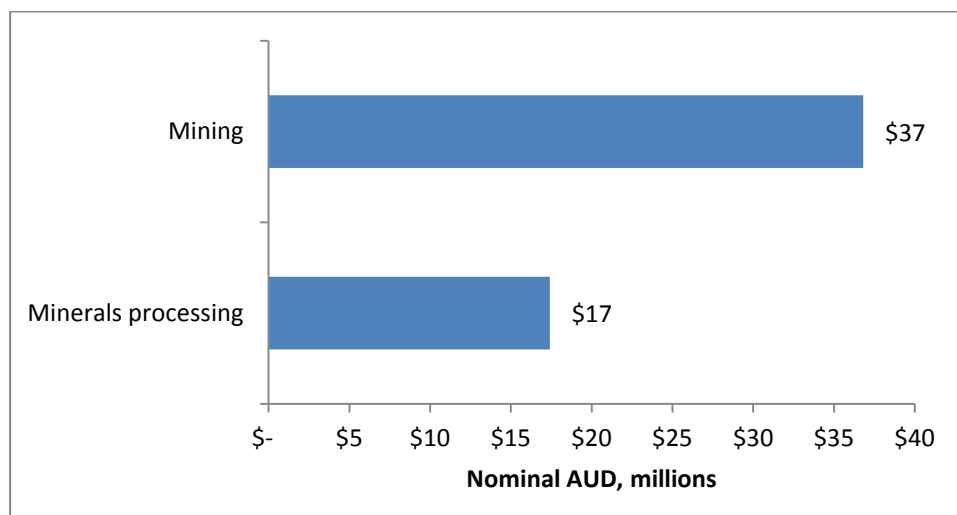
	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Total
Tasmania	5.1	4.5	7.1	10.8	9.3	17.3	54.1

Most of the relevant expenditure from the Tasmanian budget papers is either wholly or primarily dedicated to the mining industry, with some identified assistance also benefiting the minerals processing sector, as shown in Figures B24 and B25 below:

**Figure B24: Tasmania spending by level of dedication**



**Figure B25: Tasmania spending by industry segment**



## Tasmania - key themes and projects

Ironically, the key form of assistance to the Tasmanian minerals processing industry is not found in the budget papers, as it relates to the provision of electricity. The budget papers do outline some capital investment and administered programs that directly assist minerals and fossil fuel industries in the state.

### *Electricity provision*

The major subsidy to the minerals and fossil fuel industries in Tasmania is likely to be the provision of electricity to minerals processing operations at prices below market rates by state-owned Hydro Tasmania. In 2002 The Australia Institute estimated the subsidy to the Bell Bay Pacific Aluminium smelter alone at \$15 million per year.<sup>52</sup> The other major smelters, BHP's Temco manganese smelter and the Nystar zinc smelter, also receive a subsidy in this way. These major electricity consumers account for nearly half of all Tasmanian consumption and rely on cheap electricity to stay competitive with overseas competitors.<sup>53</sup>

Controversy over the prices paid by the major smelters for their electricity is almost a century old and looks set to continue well into the new millennium.<sup>54</sup>

*Ever since the debate in 1916 over the price at which the Hydro-Electric Department had contracted to supply the new zinc smelter being constructed by the Electrolytic Zinc Company of Australasia at Risdon, the Tasmanian public has held a keen interest in the relative price of electricity paid by small and large users in Tasmania.*

*The debate about the "the zinc bargain", as it was known at the time, was arguably the beginning of the ongoing speculation that significant cross-subsidisation exists between different classes of customers. This idea has been fuelled over the intervening years by pricing for large users of electricity that has lacked transparency from the perspective of the general community.*

*No published information is available in relation to the prices paid by Tasmania's largest commercial and industrial users of electricity.*

Budget papers contain no indication as to the level of subsidy provided by Hydro Tasmania to industrial users and no figure is included in our analysis.

### *Capital and administered expenses*

Major capital items included in the analysis relate to infrastructure provision in the Bell Bay area (\$18 million) and road construction on the West Coast, which will primarily benefit mining operations (\$14 million).

The Tasmanian Department of Infrastructure, Energy and Resources runs Minerals Resources Tasmania. The operating budget of its Minerals Exploration and Land Management Output is included as this program relates to the promotion rather than management of the industry. (See more detailed discussion on this body in the Methodology section.) The budget for this program was \$22 million during the analysis period.

<sup>52</sup> Turton H (2002) The Aluminium Smelting Industry: Structure, market power, subsidies and greenhouse gas emissions

<sup>53</sup> Electricity Industry Panel (2011) Tasmania's Energy Sector – an Overview

<sup>54</sup> Electricity Industry Panel (2011) p64

## Appendix C – Full list of projects and programs

### Queensland

QUEENSLAND BUDGET PAPERS	Industry segment	Dedication	Total cost \$m
<b>INFRASTRUCTURE AND PLANNING</b>			
Targinie Precinct (Gladstone Infrastructure Corridor)	Gas processing	Primarily	74.5
Stanwell to Gladstone Infrastructure Corridor	Gas processing	Primarily	9.5
Materials Transport and Services Corridor	Gas processing	Wholly	19.5
Callide to Gladstone LNG Corridor	Gas processing	Wholly	32.0
Abbot Point State Development Area (Land)	Coal transport	Primarily	19.5
Abbot Point State Development Area (service infrastructure)	Coal transport	Primarily	11.5
Abbot Point Indigenous Land Use Agreement	Coal transport	Primarily	3.9
Gladstone State Development Area (land)	Gas processing	Primarily	11.0
Gladstone State Development Area (service infrastructure)	Gas processing	Primarily	63.0
Surat Basin Rail Land Acquisition	Coal transport	Wholly	14.6
Aurukun Barge Landing	Mining	Primarily	1.3
Curtis Island LNG Water Pipeline Project (Gladstone Water Board)	Gas processing	Primarily	47.6
<b>MINES AND ENERGY</b>			
Abandoned Mines	Mining	Wholly	7.5
Mining Tenure 'Streamlining'	Mining	Wholly	16.0
Automated Titles System Modification	Mining	Primarily	5.9
Drill Core Facility (Mt Isa)	Mining	Wholly	5.1
Explosives Reserves	Mining	Wholly	1.0
<b>Electricity PNFCs</b>			
Mica Creek Power Station (CS Energy)	Gas consumption	Wholly	116.7
Kunioon Mine (Tarong Energy)	Coal mining	Wholly	133.3
Meandu Mine Project (Tarong Energy)	Coal mining	Wholly	209.9
Mine Void Ash Disposal Project (Tarong Energy)	Coal mining	Wholly	31.4
Glen Wilga Mine Review (Tarong Energy)	Coal mining	Wholly	26.4
Larcom Creek Substaion (Powerlink)	Coal transport	Primarily	74.3
Reinforce Gladstone Electricity Supply (Ergon)	Multiple	Primarily	23.2
Reinforce Goonyella Electricity Supply (Ergon)	Coal transport	Primarily	33.6
Reinforce Bowen Basin Broadlea Elec Supply (Ergon)	Coal transport	Primarily	41.9
Reinforce Boyne Island Electricity Supply (Ergon)	Minerals processing	Primarily	13.7
Moranbah Supply Augmentation (Ergon)	Coal transport	Primarily	11.3
Gladstone Substation Replacement (Powerlink)	Multiple	Primarily	126.3
Collinsville Substation Replacement (Powerlink)	Coal transport	Primarily	32.4
Dalrymple Bay-Hay Point supply (Ergon)	Coal transport	Wholly	60.5
Abbot Point supply (Ergon)	Coal transport	Wholly	32.4
Miles Generator (Qld Gas Co)	Gas consumption	Wholly	34.0
Arrow Energy Generator Connection (CS Energy)	Gas consumption	Wholly	23.6
<b>NATURAL RESOURCES AND WATER</b>			
Nathan Dam - Northern Bowen Basin supply	Coal mining	Partly	55.6

Connors River Dam - Northern Bowen Basin supply	Coal mining	Partly	68.2
Yarwun Industrial Water Treatment (Gladstone)	Multiple	Primarily	3.3
Lake Julius gas electricity distribution lines (Cloncurry)	Gas consumption	Wholly	2.3
Collinsville Pipeline	Coal mining	Partly	1.5
Burdekin-Moranbah Pipeline	Coal mining	Partly	9.6
Eungella Dam Water Pipeline	Coal mining	Partly	0.4
Aldoga Reservoir Site	Multiple	Primarily	1.1
Nathan Dam (Prefeasibility and Business Case)	Coal mining	Partly	10.8
Connors River Dam (Prefeasibility and Business Case)	Coal mining	Partly	10.5

## TRANSPORT

### Rail Network

Jilalan Yard Upgrade	Coal transport	Wholly	485.6
Northern Minerals Provenance: Driver activated points	Mining	Wholly	107.0
Dalrymple Bay Coal Terminal 3rd Loop	Coal transport	Wholly	118.8
Broadlea-Mallawa-Wotonga Duplication	Coal transport	Wholly	67.6
Stanwell to Wycarbah Duplication	Coal transport	Wholly	71.5
Mt Isa Line Concrete Relay & works	Mining	Partly	117.2
Goonyella-Abbot Point Expansion (Missing Link Project)	Coal transport	Wholly	830.7
Goonyella-Abbot Point Expansion (Long Lead Time Items)	Coal transport	Wholly	42.1
Callemonda 3rd Spur	Coal transport	Wholly	35.8
Westwood to Wycarbah Duplication	Coal transport	Wholly	30.2
Bolingbroke Electricity Feeder Station	Coal transport	Wholly	29.9
Raglan Electricity Feeder Station	Coal transport	Wholly	52.0
Duaringa Electricity Feeder Station	Coal transport	Wholly	47.4
Wycarbah Electricity Feeder Station	Coal transport	Wholly	47.3
Bluff Electricity Feeder Station	Coal transport	Wholly	45.5
Vermont Spur and Balloon Loop	Coal transport	Wholly	71.8
Coppabella Yard Upgrade	Coal transport	Wholly	7.3
Coppabella-Ingsdon Duplication	Coal transport	Wholly	75.4
Grandleigh to Tunnel Duplication	Coal transport	Wholly	49.0
Moura Line Passing Loops/Turnout Replacements	Coal transport	Wholly	22.6
Moura Link (Prelim Design)	Coal transport	Wholly	20.0
Wiggins Island (Gladstone) Balloon Loop	Coal transport	Wholly	23.0
Central Qld Coal Rail Formation Strengthening	Coal transport	Wholly	19.4
Kinrola Branch Relay (Rolleston)	Coal transport	Wholly	16.6
Mindi Substation	Coal transport	Wholly	18.5
St Lawrence River Bridge Replacement	Coal transport	Wholly	28.9
Harrow Passing Loop (Peak Downs)	Coal transport	Wholly	8.1
Sonoma Balloon Loop	Coal transport	Wholly	2.3
Goonyella System Upgrade (Electrification)	Coal transport	Wholly	11.4
Aldoga to Wiggins Island Upgrade	Coal transport	Wholly	15.8
Banana to Wooderson Track Upgrade	Coal transport	Wholly	14.0
Columboola to Fishermans Island Project (Surat Basin)	Coal transport	Primarily	31.4
Corridor Integrity Strategy & Land Requirements	Coal transport	Primarily	25.9
Rail Network Infrastructure Upgrade	Coal transport	Primarily	181.2

Statewide Operating and Enabling Works	Coal transport	Primarily	129.8
<b>Rollingstock</b>			
Electric Loco Fleet Upgrade (Stages 1&2)	Coal transport	Wholly	202.4
1,190 New Coal Wagons (VCA 106T)	Coal transport	Wholly	155.7
370 New Coal Wagons 106T	Coal transport	Wholly	63.5
Electric Loco Upgrade Program	Coal transport	Wholly	146.2
10 x 4100 Class Diesel Electric Locomotives	Coal transport	Wholly	74.8
15 x 4100 Class Diesel Locomotives	Coal transport	Wholly	95.3
12 & 16 Cylinder Loco Overhauls	Coal transport	Wholly	50.8
4000 Class Loco E Inspection Program	Coal transport	Wholly	25.9
510 VCA Coal Wagons	Coal transport	Wholly	14.8
VNQ Coal Wagon Overhauls	Coal transport	Wholly	4.2
<b>Port Authority PNFCs</b>			
RG Tanna Coal Terminal Expansion	Coal transport	Wholly	780.0
RG Tanna Coal Terminal Ongoing Project	Coal transport	Wholly	289.2
RG Tanna Coal Terminal Dust Control	Coal transport	Wholly	6.8
Wiggins Island Feasibility	Coal transport	Wholly	5.0
Gladstone Ports General Projects	Coal transport	Primarily	314.0
Fishermans Landing Project	Coal transport	Wholly	86.8
Barney Point Project	Coal transport	Wholly	19.8
Auckland Point Project	Coal transport	Wholly	21.9
Wiggins Island Project	Coal transport	Wholly	10.0
Abbot Point Expansion X50	Coal transport	Wholly	724.1
Abbot Point Expansion X21	Coal transport	Wholly	20.0
Abbot Point Expansion X25	Coal transport	Wholly	95.0
Abbot Point Expansion SR1 & SR2	Coal transport	Wholly	71.0
Abbot Point Expansion X110 (Prelim)	Coal transport	Wholly	37.5
X230 Masterplan	Coal transport	Wholly	4.0
Abbot Point Terminals 2 & 3	Coal transport	Wholly	23.6
Common User Infrastructure	Coal transport	Primarily	1.6
Louisa Creek Land Acquisition	Coal transport	Primarily	31.3
Hay Point Masterplan and EIS	Coal transport	Wholly	30.7
Abbot Point Port Development	Coal transport	Wholly	28.9
Hay Point Port Development	Coal transport	Wholly	10.2
Weipa Port Development	Mining	Primarily	6.6
Townsville Berth 8 (Xstrata Cannington) Upgrade	Mining	Wholly	34.4
<b>Total estimated value of capital spending 2008-09 to 2013-14 (\$m)</b>			<b>7,918.1</b>
<b>Concessions Statement (2012-13 &amp; 2013-14)</b>			
Rail infrastructure concessions	Coal transport	Partly	1,050.6
Gladstone Power Station subsidies (IPPA)	Minerals processing	Primarily	467.2
Gladstone Port charges concessions	Coal transport	Wholly	92.0
Gladstone Port lease concessions	Coal transport	Wholly	6.9
NQ Bulk Ports lease concessions	Coal transport	Wholly	3.0
Mining industry training subsidy	Coal mining	Wholly	3.3

<b>Total Concessions (\$m)</b>	<b>1,623.0</b>
<b>Total estimated value of subsidies 2008-09 to 2013-14 (\$m)</b>	<b>9,541.1</b>

## Western Australia

WESTERN AUSTRALIA BUDGET PAPERS	Industry segment	Dedication	Total cost \$m
<b>TREASURY&amp;FINANCE/INDUSTRY AND RESOURCES/STATE DEVELOPMENT</b>			
Burrup and Maitland Agreement	Gas extraction	Primarily	2.0
On-Road Diesel Subsidies	Petroleum consumption	Wholly	14.9
Mining Tenement Backlog	Mining	Wholly	3.0
Plan for Accelerating Exploration (PACE) - Exploration Incentive Scheme	Multiple	Wholly	80.0
Ord River Expansion Project	Multiple	Partly	267.7
Ord Expansion Project - Aboriginal Development package	Multiple	Partly	8.9
Oakajee Port and Rail Project	Mining	Wholly	23.8
Kimberley LNG Precinct	Gas processing	Primarily	4.4
Bunbury to Albany Gas Pipeline	Gas consumption	Wholly	2.5
Browse Liquid Natural Gas Precinct Project	Gas processing	Primarily	126.5
Browse LNG Precinct Regional Benefits	Gas processing	Partly	62.8
Browse LNG Precinct Project - Kimberley Land Council Funding	Gas processing	Partly	8.0
Browse LNG Precinct Land Survey Costs	Gas processing	Primarily	8.9
Coal Industry Development	Coal mining	Wholly	17.0
Anketell Multi-User Port and Strategic Industrial Area - New Funding	Mining	Wholly	4.9
Ashburton North Multi-User Port and Strategic Industrial Area	Gas processing	Primarily	7.5
Onslow Critical Infrastructure Package	Gas processing	Primarily	33.9
Accelerating Reinvestment in Western Australian Mine Sites	Mining	Wholly	5.2
Esperance Port Authority - Capital fund	Mining	Partly	2.3
Exploration Incentive Scheme	Mining	Wholly	20.6
Exploration Incentive Scheme Phase 2	Mining	Wholly	0.0
Kimberley Science Strategy Baseline Geochemical and Geophysical Surveys	Mining	Wholly	3.0
Geoscience Information and Advice	Mining	Primarily	264.4
Minerals and Energy Research Institute	Mining	Primarily	4.0
Sustaining Reduction in Mineral Titles Application Processing	Mining	Wholly	1.5
Mining Tenement Refunds	Mining	Wholly	58.5
Dampier Port Authority - Burrup Port Infrastructure-Subsidy	Gas processing	Wholly	9.7
Broome Port Authority - Capital fund	Gas processing	Primarily	1.8
<i>Petroleum (Submerged Lands) Act 1982</i>	Gas processing	Wholly	24.3
Industry Development and Investment Facilitation	Multiple	Primarily	411.7

State Economic Development Policy	Multiple	Primarily	6.5
Browse LNG Precinct Native Title Agreements Implementation Costs	Gas processing	Wholly	2.4
Remuneration for mining on Aboriginal lands	Multiple	Wholly	1.8
Northampton Lead Tailings	Mining	Wholly	1.3
<b>Controlled grants and subsidies</b>			
Water Corporation - Burrup Water System Subsidy	Gas processing	Primarily	50.9
Western Australian Land Authority - Burrup Service Corridor - Subsidy	Gas processing	Primarily	2.1
Pilbara Strategic Infrastructure	Gas processing	Primarily	59.8
Browse LNG Precinct Project	Gas processing	Wholly	26.0
Gorgon Gas Carbon Injection Project	Gas processing	Primarily	0.4
Anketell Multi-User Port	Mining	Wholly	1.1
Australia China Natural Gas Technology Partnership Fund	Gas processing	Primarily	1.3
Port of Wyndham - Capital works	Mining	Partly	13.2
BHP Direct Reduced Iron Pty Ltd Grant	Minerals processing	Wholly	2.5
Oakajee Port and Rail Project	Mining	Wholly	4.9
Fremantle Port Authority - Capital works	Multiple	Primarily	5.5
Port Hedland Port Authority - Capital works	Multiple	Primarily	22.2
Pilbara Infrastructure Australia (State Contribution)	Gas processing	Primarily	16.0
Pilbara Revitalisation Phase 2	Gas processing	Primarily	155.4
Kimberley Regional Development Scheme	Mining	Partly	0.8
Government Co-Funded Exploration Drilling	Mining	Wholly	21.7
Industry Development Financial Assistance	Gas processing	Partly	30.1
Mineral and Petroleum Industry	Gas processing	Primarily	0.4
National Mine Safety Framework Secretariat	Mining	Wholly	0.6
Feasibility Assessment of Outer Harbour at Port Hedland	Mining	Wholly	0.3
North West Shipping	Gas processing	Primarily	51.0
<b>TRANSPORT AND MAIN ROADS</b>			
Ravensthorpe to Hopetoun Road - Reconstruct and Widen (Yabulu Ravensthorpe Nickel Project)	Mining	Wholly	0.3
Coolgardie - Esperance Highway Esperance Port Access	Mining	Primarily	123.0
South Coast Highway - Various Improvement Works (Yabulu Ravensthorpe Nickel Project)	Mining	Primarily	1.2
Esperance Lead/Nickel Clean-Up	Mining	Wholly	14.5
Wyndham Port Facility Upgrade	Mining	Partly	10.4
Oakajee Port and Rail Project	Mining	Wholly	3.9
Kwinana Freeway - Freight Management System	Petroleum consumption	Primarily	0.6
Dampier Highway to Seven Mile Access (Stage 4)	Mining	Primarily	59.5
Infrastructure for State Development	Multiple	Partly	1,592.8
<b>DAMPIER PORT AUTHORITY</b>			
Dampier Cargo Wharf Upgrade	Mining	Wholly	2.1
Improvements to Port Facilities - Burrup Infrastructure	Gas processing	Wholly	55.6
Gangway for Bulk Liquids Berth	Gas processing	Wholly	3.0
Cyclone Shed	Mining	Primarily	1.1

Asset Investment - Port of Ashburton	Gas processing	Wholly	1.0
Minor Works	Multiple	Primarily	22.2
<b>ESPERANCE PORT AUTHORITY</b>			
Bulk Storage Facility and Shore Based Crane	Mining	Wholly	25.9
Iron Ore Circuit Upgrade	Mining	Wholly	4.0
Nickel Concentrate Circuit Upgrade	Mining	Wholly	42.2
Rail Refurbishment Works	Mining	Wholly	2.0
Hughes Road Upgrade	Mining	Primarily	4.7
Iron Ore Shed Ventilation Upgrade	Mining	Wholly	0.0
Minor Works	Mining	Primarily	14.7
Pilot vessel	Mining	Primarily	1.0
<b>FREMANTLE PORT AUTHORITY</b>			
Hismelt - Infrastructure for Hismelt - Stage 1 and Other Bulk Users	Minerals processing	Wholly	1.3
Kwinana Bulk Terminal (KBT) - Infrastructure and Equipment Replacement	Minerals processing	Wholly	36.2
Kwinana Bulk Jetty (KBJ)	Petroleum consumption	Wholly	9.6
KBT Civil and Mechanical Assets Upgrade	Minerals processing	Wholly	5.2
Kwinana Bulk Berth No.3 New Tanker Discharge System	Petroleum consumption	Wholly	0.5
KBJ - Export-Import Infrastructure	Petroleum consumption	Wholly	1.1
Export-Import Infrastructure Phase 2	Petroleum consumption	Wholly	0.5
KBJ - Bulk Handling Equipment	Petroleum consumption	Wholly	2.6
KBJ – Truck Loading Facility and Storage Shed Lot 13	Petroleum consumption	Wholly	1.0
KBJ Eport - Import Infrastructure Phase 2	Petroleum consumption	Wholly	1.5
KBJ - Replace Plant	Petroleum consumption	Wholly	0.7
KBJ - Replace/Upgrade Transformer and Switchgear	Petroleum consumption	Wholly	0.0
KBJ - Unloader No. 2 Emergency Unloading Boom Brake	Petroleum consumption	Wholly	0.5
Modifications to a Pipeline Manifold Area	Petroleum consumption	Wholly	0.5
Fibre Optic Cabling	Petroleum consumption	Wholly	0.3
Kwinana Bulk Jetty - Fire Fighting Foam System	Petroleum consumption	Wholly	7.0
New Rail Link (Second Spur Line)	Minerals processing	Primarily	0.5
KBT - Undercover Storage	Minerals processing	Wholly	13.4
KBT - Upgrade Rail Infrastructure and Replacement	Minerals processing	Wholly	1.3
KBT - Upgrade of Export Infrastructure	Minerals processing	Wholly	15.0
Upgrade of Conveyor EC03	Minerals processing	Wholly	6.4
Dust Control and Roadworks	Minerals processing	Wholly	1.8
Transport Interchange Facilities	Petroleum consumption	Partly	10.0
Minor Works	Petroleum	Partly	6.8



	consumption		
GERALDTON PORT AUTHORITY			
Berth 5 - Iron Ore Expansion	Mining	Wholly	33.9
Oakajee Port and Rail Project	Mining	Wholly	11.6
Wastewater Treatment Plant	Mining	Primarily	2.0
Multipleellaneous Works	Mining	Primarily	20.5
Pilot vessel	Mining	Primarily	2.5
PORT HEDLAND PORT AUTHORITY			
Utah Point Berth - Multi-User Panamax Berth	Mining	Wholly	316.8
Infrastructure - Utah Point Office Building	Mining	Wholly	1.5
Plant and Equipment - Utah Point Outload Circuit Upgrade	Mining	Wholly	1.0
Maintenance Dredging	Mining	Wholly	30.0
Minor Works	Mining	Wholly	40.5
PEEL DEVELOPMENT COMMISSION			
Boddington Mine Expansion	Mining	Wholly	8.0
KIMBERLEY DEVELOPMENT COMMISSION			
Policies, Strategies, Plans and Regional Promotion	Multiple	Partly	19.6
Industry and Infrastructure Identification Co-ordination and Development	Multiple	Partly	37.2
Ord Enhancement Scheme	Multiple	Partly	9.3
PILBARA DEVELOPMENT COMMISSION			
Business and Industry Development	Multiple	Primarily	11.4
Infrastructure and Service Identification and Coordination	Multiple	Primarily	24.9
Regional Promotion and Information Services	Multiple	Primarily	15.1
Pilbara Infrastructure Australia (State Contribution - capital program)	Multiple	Primarily	245.3
Pilbara Revitalisation Phase 2	Multiple	Primarily	47.7
WATER CORPORATION			
Boddington Water and Wastewater Schemes	Mining	Primarily	5.4
Hopetoun Ravensthorpe Wastewater Treatment Scheme	Mining	Primarily	6.0
Woodman Point Odour Control (Stage 1 and 2)	Minerals processing	Partly	28.9
Hopetoun Ravensthorpe Wastewater Treatment Scheme 2	Mining	Primarily	6.0
Bulla Bulling (Goldfields) - 15ML Storage	Mining	Primarily	13.2
Goldfields and Agricultural Water Supply - Pipeline Upgrade	Mining	Partly	9.5
Pilbara - Port Hedland Wastewater Treatment Plant Relocation	Mining	Partly	70.0
Hedland Yule Upgrade	Mining	Primarily	61.1
Karratha Wastewater Treatment Plant Upgrade	Mining	Partly	60.0
VERVE ENERGY			
2 x new 100 megawatt high efficiency gas turbines	Gas consumption	Wholly	285.1
Collie Power Station and Basin Infrastructure	Coal consumption	Primarily	64.0
Muja Power Station coal contract modifications	Coal consumption	Wholly	321.4
Cockburn and Pinjar Power Station modifications to improve turbine reliability	Gas consumption	Wholly	225.0

Kwinana Power Station	Gas consumption	Wholly	110.3
<b>Total estimated value of subsidies 2008-09 to 2013-14 (\$m)</b>			<b>6215.5</b>

## New South Wales

NEW SOUTH WALES BUDGET PAPERS	Industry segment	Dedication	Total cost \$m
<b>DEPARTMENT OF TRANSPORT</b>			
Interstate and Hunter Valley Rail Network grant	Coal transport	Primarily	22.8
Thornton Railway Bridge Thornton	Coal transport	Primarily	19.2
Cormorant Road, Industrial Drive to Stockton Bridge	Coal transport	Primarily	1.4
Widening rail underpass - New England Highway, Singleton	Coal transport	Primarily	0.7
<b>DEPARTMENT OF WATER AND ENERGY</b>			
Upper Hunter Air Quality - Dust Monitoring Network	Coal mining	Wholly	2.0
Clean Coal Fund	Coal mining	Wholly	87.5
ACALET Ltd Delta Carbon Capture and Storage project	Coal mining	Wholly	28.3
Assistance package for the Western and Gunnedah Coalfields	Coal mining	Wholly	10.0
Independent review of coal seam gas activities	Gas extraction	Wholly	1.5
<b>DEPARTMENT OF AGRICULTURE, FORESTS AND FISHERIES</b>			
Mineral Resources Business and Technology System	Mining	Wholly	4.0
Cobbora Coal Mine (feasibility study)	Coal mining	Wholly	76.0
New Frontiers pre-exploration data collection	Mining	Wholly	8.5
State Investment Attraction Scheme and Regional Industries Investment Fund	Mining	Partly	69.0
<b>PNFC CAPITAL EXPENDITURE - PORTS</b>			
<b>Port Kembla</b>			
Port Kembla Port Corporation	Multiple	Primarily	33.6
Port Kembla Port Corporation (Inner Harbour)	Multiple	Primarily	100.0
Port Kembla Port Corporation (Outer Harbour 1st stage)	Multiple	Primarily	15.8
Inner Harbour rail upgrade	Multiple	Primarily	2.7
Inner Harbour load-out facility	Multiple	Primarily	1.0
Outer Harbour rail track renewal	Multiple	Primarily	3.4
Land Purchases Adjacent to Outer Harbour	Multiple	Primarily	9.0
Outer Harbour Stage 1A Dredging and Complete Reclamation	Multiple	Primarily	30.5
Port Kembla new tug berth	Multiple	Primarily	7.0
Tug fleet base	Multiple	Primarily	16.5
Garungaty embankment works	Multiple	Primarily	0.5
Tom Thumb Road bridge upgrade	Multiple	Primarily	0.5
Port Kembla rail improvements and signalling	Multiple	Primarily	1.1
Replacement pilot vessel	Multiple	Primarily	1.2
Replacement Pilot Vessel II	Multiple	Primarily	3.3

Shipping management system	Multiple	Primarily	0.4
Vessel Traffic Centre relocation	Multiple	Primarily	0.3
Rail Turnout Replacements and Renewals/Master plan extensions	Multiple	Primarily	2.2
<b>Newcastle</b>			
Newcastle Port Corporation (Mayfield No. 4 berth)	Coal transport	Primarily	27.6
Newcastle Pilot Station Port Centre	Coal transport	Primarily	3.7
Replacement pilot vessel	Coal transport	Primarily	2.5
Replace Vessel Traffic Information System	Coal transport	Primarily	0.5
Harbour Management System	Coal transport	Primarily	2.0
Strategic land acquisition - Mayfield	Coal transport	Primarily	10.0
Kooragang Island dredging and berth upgrades	Coal transport	Primarily	2.2
Channel berth refurb. Dolphins 3 & 4, deck and roads (Carrington)	Coal transport	Primarily	3.1
Dyke 2 Berth Walkway replacement	Coal transport	Primarily	0.6
Strategic Dredging Approvals for Walsh Point and Mayfield	Coal transport	Primarily	0.6
Electronic records system	Coal transport	Primarily	1.0
Upgrade security system (CCTV)	Coal transport	Primarily	0.3
Rail realignment at Mayfield	Coal transport	Primarily	0.9
Kooragang Island sub-transmission substation	Coal transport	Primarily	35.0
330/132kV Substations and works at Tomago, Williamsdale, Waratah West...	Coal transport	Primarily	106.4
Augmentation of supply at Cessnock	Coal transport	Primarily	14.7
Carrington substation reconfiguration	Coal transport	Primarily	1.0
Kooragang fender and gangway landing platform	Coal transport	Primarily	1.9
Enterprise Resource Planning System	Coal transport	Primarily	8.9
Dyke Point Development business case	Coal transport	Primarily	0.4
Floating jetty for operations vessels	Coal transport	Primarily	0.3
Kooragang Island Environmental Management works	Coal transport	Primarily	0.5
Kooragang roads upgrade	Coal transport	Primarily	2.0
West Basin 3 & 4 cathodic protection	Coal transport	Primarily	1.4
Sea dumping permit (Commonwealth approval)	Coal transport	Primarily	0.4
<b>WATER</b>			
Illawarra wastewater strategy (recycled water to industrial customers)	Minerals processing	Primarily	24.3
Kooragang Island recycled water system works	Coal transport	Partly	61.2
<b>Total estimated value of subsidies 2008-09 to 2013-14 (\$m)</b>			<b>872.8</b>

## Northern Territory

NORTHERN TERRITORY BUDGET PAPERS	Industry segment	Dedication	Total cost \$m
<b>Mines and Energy</b>			
Resource Industry Development	Gas processing	Wholly	125.3
<b>Darwin Port Corporation</b>			
East Arm Wharf - enclose ore conveyor and belt washing	Mining	Wholly	5.4
East Arm Wharf - purpose built wash down area for ore	Mining	Wholly	1.2
Reclamation of land	Gas processing	Wholly	44.7
Upgrading and sealing land	Gas processing	Wholly	15.1
East Arm bulk load facility & new conveyor	Mining	Wholly	40.9
Marine supply base - connect essential services	Gas processing	Wholly	6.0
Marine supply base (oil & gas) - Stage 1 Construction	Gas processing	Wholly	61.4
Marine supply base (oil & gas) - Stage 2 Construction	Gas processing	Wholly	15.4
<b>Land Development Corporation</b>			
Wishart Road Development - industrial land at East Arm	Gas processing	Wholly	21.3
East Arm Marine Precinct Stage 1a	Gas processing	Wholly	0.5
East Arm Marine Precinct land reclamation (Casey Rd Development)	Gas processing	Primarily	8.8
Provision of sewage services	Gas processing	Primarily	17.5
<b>Lands, Planning and Environment</b>			
Middle Arm Industrial Precinct - construction	Gas processing	Wholly	31.7
Blaydin Point site works	Gas processing	Wholly	11.6
<b>Total estimated value of subsidies 2008-09 to 2013-14 (\$m)</b>			<b>406.7</b>

## South Australia

SOUTH AUSTRALIA BUDGET PAPERS	Industry segment	Dedication	Total cost \$m
<b>Manufacturing, Innovation, Trade, Resources and Energy</b>			
Minerals Asset Upgrade and Replacement	Mining	Wholly	0.6
Mineral Resources	Mining	Wholly	189.4
Brunkunga Mine - weir construction and control of acid seepage	Mining	Wholly	21.1
Gawler Craton Enhanced Exploration Program (PACE)	Mining	Wholly	5.6
Mining and Petroleum Services Centre of Excellence	multiple	Wholly	2.0
Woomera Geoscience Survey Program	Mining	Wholly	3.8
State Drill Core Library Facility	Mining	Wholly	1.9
Energy Resources	Gas extraction	Primarily	36.5
Olympic Dam Taskforce	Mining	Wholly	8.8
<b>Planning, Transport and Infrastructure</b>			
Port Augusta to Olympic Dam Road — Shoulder sealing	Mining	Primarily	19.0
Port Bonython Jetty Refurbishment	Mining	Primarily	23.9
<b>Environment, Water and Natural Resources</b>			

National Partnership Agreement on Coal Seam Gas and Large Coal Mining Development	Gas extraction	Wholly	3.6
<b>Total estimated value of subsidies 2008-09 to 2013-14 (\$m)</b>			<b>316.2</b>

## Victoria

VICTORIA BUDGET PAPERS	Industry segment	Dedication	Total cost \$m
<b>DEPARTMENT OF SUSTAINABILITY AND ENVIRONMENT</b>			
Barwon Water – Shell Recycling Project	Petroleum processing	Partly	29.2
<b>Department of State Development, Business and Innovation</b>			
Carbon capture and storage	Coal mining	Wholly	132.0
Clean Coal Victoria	Coal mining	Wholly	2.5
Mine stability	Coal mining	Wholly	2.1
Strengthening our earth resources sector	Multiple	Wholly	4.3
<b>CENTRAL GIPPSLAND REGION WATER CORPORATION</b>			
Moe Waste Water Treatment Plant New ultra violet unit	Coal mining	Partly	0.2
Morwell water – twin six main replacement	Coal mining	Partly	0.1
Major client – pressure reduction and replacement (Morwell)	Coal mining	Partly	2.9
Moe water treatment plant – sludge handling system	Coal mining	Partly	3.3
Moondarra – Replace/repair the PSC pipework through TRC tunnels	Coal mining	Partly	0.2
Regional outfall sewer Maryvale hydraulic balancing covered storage	Coal mining	Partly	0.9
Traralgon waste – Stockdale Road 500mm high density polyethylene	Coal mining	Partly	1.1
Traralgon Sewer Pump Station and rising main for eastern industrial development	Coal mining	Partly	3.1
Yarragon waste – Factory Road Sewer Pump Station	Coal mining	Partly	1.6
Yallourn North Sewerage Pump Station rising main replacement	Coal mining	Partly	0.3
Warragul – Moe water supply interconnect (Water Supply Demand Strategy Action 6)	Coal mining	Partly	6.3
<b>WANNON REGION WATER CORPORATION</b>			
Portland – wastewater treatment plant upgrade	Minerals Processing	Partly	15.7
<b>Total estimated value of subsidies 2008-09 to 2013-14 (\$m)</b>			<b>205.7</b>

## Tasmania

TASMANIA BUDGET PAPERS	Industry segment	Dedication	Total cost \$m
<b>Infrastructure Projects (Major Initiatives)</b>			
Bell Bay Intermodal Terminal	Minerals processing	Primarily	16.6
West Coast Geosciences Project	Mining	Wholly	1.5
West Coast Roads	Mining	Primarily	13.6
<b>Infrastructure, Energy and Resources</b>			
Mineral Resources Management and Administration	Mining	Wholly	21.7
Bell Bay Main Road improved port access near George Town	Minerals processing	Primarily	0.8
<b>Total estimated value of subsidies 2008-09 to 2013-14 (\$m)</b>			<b>54.1</b>

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# Minerals in the Australian Economy

Presentation to the National Peak Minerals Forum

Australian Museum  
Sydney  
29 April 2010

David Richardson  
Senior Fellow  
The Australia Institute

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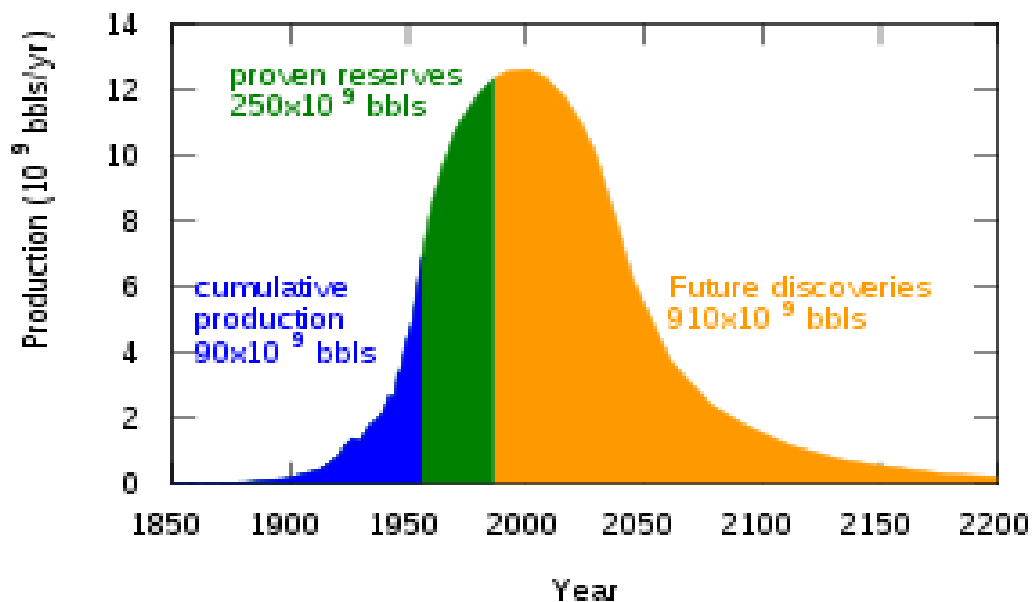
## Introduction

'Minerals in the Australian economy' is of course a big topic. On the one hand that means it is inevitable that major issues are not discussed. On the other hand it means that the contributor has a lot of scope to select what to talk about.

The position here is not to question the peak mineral thesis but to explore what that would mean for the Australian economy more widely.

Just to be clear though; much of the discussion below accepts the peak production thesis which suggests production will peak in the near future and decline thereafter. The originator of this idea used a model which suggested oil production would follow a pattern as shown in the following diagram.

Figure 1: World Oil Production



Source: Wikipedia after M K Hubbert.

## 1 Macroeconomic aspects of the mining industry.

In 2008-09 mining accounted for sales of \$132 billion or 11 per cent of GDP. Value added by mining was \$81 billion (using 2007-08 prices). That amounts to 6.8 per cent of GDP.

Mining is a very productive industry; output per worker is \$497,000 per annum, well above the national average of \$111,000.<sup>1</sup> However, productivity in Australia peaked in 2001-02 when output per employee was \$845,000 per annum.<sup>2</sup> Since then mining productivity has declined by an average of 7.5 per cent per annum.

The value of mining exports was \$119 billion or 9.9 per cent of GDP in 2008-09. Of course, exports are themselves 20 per cent of GDP implying mining exports are 50 per cent of total exports.<sup>3</sup> Mining exports are a very high 90 per cent of total sales according to the above figures. However, the export figures are likely to include some value added inputs from manufacturing, transport and other sectors.

The changing fortunes of the mining industry have had an impact on the construction industry in particular. For example, in real terms the volume of engineering construction in Australia increased from \$9.5 billion in 2000-01 to \$47.6 billion in 2008-09.<sup>4</sup>

Along with high output per worker are high incomes per worker. Average weekly full time adult ordinary time earnings in the mining industry were the equivalent of \$101,150 in November 2009 compared with the average of \$63,794 across all industries in Australia.<sup>5</sup> So the average wage in mining is 59 per cent higher than Australia as a whole.

There is no doubt that mining is a big and important part of the Australian economy. But we can still ask the hypothetical question: What would happen if mining disappeared altogether? This question will be important in our later discussion of the other side of the peak.

Let's look at this through the eyes of many economists. There is a certain number of potential workers and a certain value of capital. Depending on the pattern of demand the firms in Australia hire labour and capital and direct them into the most profitable pursuits. At the moment much of Australia's labour and capital are directed into mining. However, if mining did not exist, more of Australia's labour and capital would be directed into other sectors that would also be useful. So if mining did not exist something would replace it. The question then is whether there are net benefits compared with what the alternative would look like.

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<sup>1</sup> ABS (2009) Australian System of National Accounts, 2008-09, cat no 5204.0, 8 December.

<sup>2</sup> ABS (2010) Mining Indicators, Australia, Sept 2009, Cat no 8417.0, 11 March and ABS (2010) Labour Force, Australia, Detailed, Quarterly, Feb 2010, Cat no 6291.0.55.003, 17 March.

<sup>3</sup> Figures are from ABS (2009) *Australian System of National Accounts, 2008-09*, cat no 5204.0, 8 December and refer to the 2009 calendar year.

<sup>4</sup> ABS (2010) Construction Activity: Chain Volume Measures, Australia, December 2009, Cat No 8782.0.65.001, 14 April.

<sup>5</sup> ABS (2010) Average Weekly Earnings, Australia, Nov 2009, cat no 6302.0, 25 Feb.

Of course, if a large industry died suddenly it would take some time for the unemployed workers to find alternative employment, especially if they had been concentrated in a region specialising in their industry. The capital would have been tied up in specific pieces of plant and equipment—that would all be lost. A sudden death in any industry would be a very serious issue to be confronted by governments.

However, normally declining industries take time to actually die. Employment tends to dry up slowly. Often no-one is necessarily sacked; normal workforce turnover can be relied upon by employers. They simply do not replace workers who quit.

Equally capital need not be withdrawn; it is simply not replaced when it has worn out. Assuming the original investment decisions were sound then the value of the capital advanced has been replaced. For example the brown coal power stations in Victoria were depreciated long ago. That means that the original owners would have gradually received back their capital in depreciation expenses before they declared a profit. The present value of their plant and equipment is probably no more than its scrap value—if that.

So assuming mining was to disappear gradually would anyone really care? Would it be any different to the decline in the printing industry, blacksmiths, and switchboard operations? The most important consideration seems to be that mining is a high productivity industry and any alternative use for the capital and labour employed in mining would most likely involve a lower contribution to national income and output.

Mining in Australia illustrates the need to carefully distinguish productivity levels from productivity growth rates. Mining is an example of an industry with mediocre productivity performance over the last couple of decades. In the seven years to 2001-02 mining productivity had been growing at 5.6 per cent but in the following seven years mining productivity actually fell by an average of 7.5 per cent per annum.<sup>6</sup> The fall in productivity in recent years has been explained by the Productivity Commission which gives a number of reasons for mining's productivity; for example, mining companies have had to resort to less attractive deposits that are harder to mine. On top of that, the depletion of resources such as oil means that roughly the same numbers are involved trying to lift the oil but the output has fallen.<sup>7</sup> Those and other factors are thought to be behind the fall in mining productivity.

So any shift of resources into mining will still increase Australia's overall productivity. As a simplified example, suppose output per head is 500 in mining and 100 elsewhere. If mining is 5 cent of the economy then the total output per head will be 120. If now mining expands to 10 per cent of GDP, then total output will grow to 140. Hence the shift of resources into mining has resulted in a 17 per cent increase in output per head. Something like this has happened in Australia with the resources boom increasing mining's share of GDP which has more than offset the declining productivity in mining itself.

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<sup>6</sup> ABS (2009) Australian System of National Accounts, 2008-09, cat no 5204.0, 8 December

<sup>7</sup> Topp V, Bloch H and Parham D (2008) *Productivity in the mining industry: Measurement and interpretation*, Productivity Commission Staff Working Paper, December.

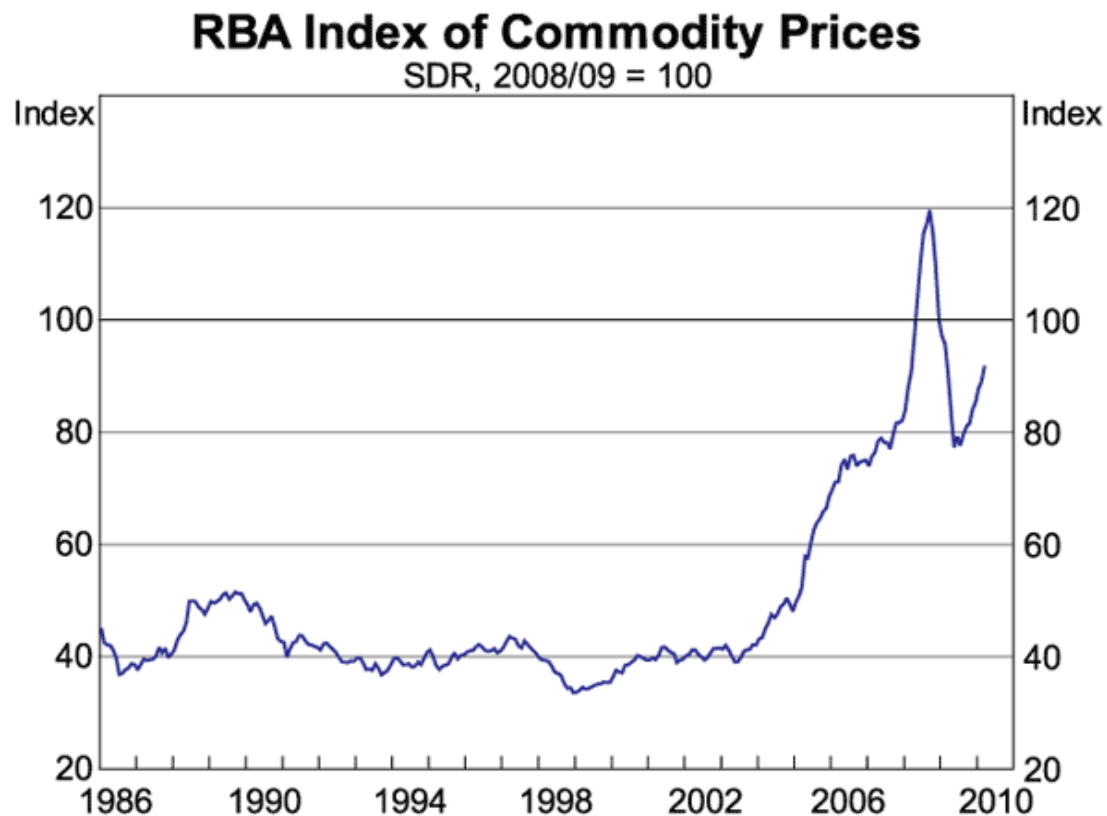


## 2 Macroeconomic effects of volatile prices.

### Price and A\$ fluctuations

Minerals and other commodities are subject to massive price changes. The mining boom has been associated with another of those massive increases in prices as can be seen in Graph 1 below. The graph is taken from the Reserve Bank site and gives the index of commodity prices over the last 15 years.<sup>8</sup>

Chart 1: Commodity Prices

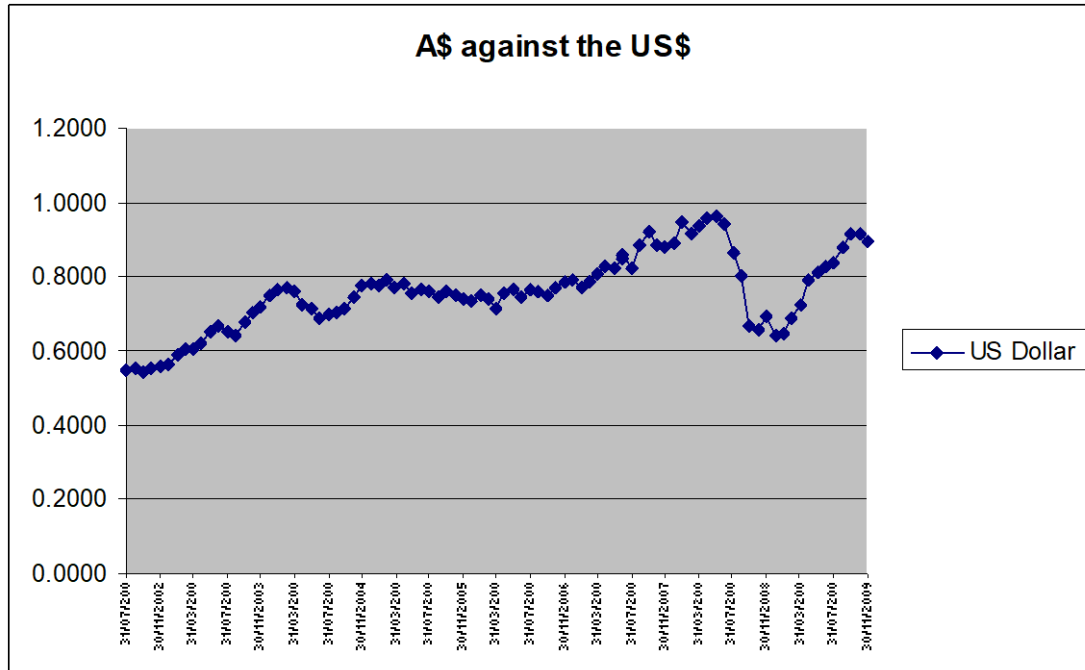


Source: RBA (2010) *Index of Commodity Prices*, 1 April at <http://www.rba.gov.au/statistics/frequency/commodity-prices.html>

Dramatic price fluctuations such as those in the graph are going to imply major disruptions in the Australian economy. For a start there have been large changes in the value of the Australian dollar. Chart 2 shows the value of the A\$ against the US\$ between July 2002 to December 2009.

<sup>8</sup> The index is expressed in Special Drawing Rights (SDRs) which are an artificial currency used by the International Monetary Fund. For present purposes the SDR can be taken as an independent measure of the movement in international prices. (If we expressed the same series in A\$ the result would be contaminated by movements in the A\$ which in turn are influenced by the commodity prices. We don't want to use as the measuring stick a ruler which is contaminated by that which it is measuring.)

Chart 2: Value of the Australian dollar



Source: RBA Statistical Tables at <http://www.rba.gov.au/statistics/tables/index.html> accessed 16 April 2010.

High prices are one thing but fluctuating prices also pose problems. Even in the mining sector itself it can be assumed that higher volatility in prices are likely to deter investors, even though the average price (or future expected price) might be the same. Even if prices are high, higher volatility increases the risk that a given project will take much longer to pay back the initial outlay or earn the required rate of return.

A problem with the mining industry is that its volatility spreads to other sectors of the economy with one of the chief transmission mechanisms being the currency fluctuations. For companies elsewhere in the economy, fluctuating currencies are going to signal that any project is going to have a more problematic outcome, especially where foreign sales or purchases are involved.

### Higher incomes from the mining boom?

The assumption that we have all enjoyed higher incomes as a result of the mining boom is rarely examined properly. The Australia Institute has recently done just that and the results are very interesting.<sup>9</sup>

The main benefits are supposed to come through the terms of trade. The terms of trade essentially measure the purchasing power of our exports by dividing an index of export prices by an index of import prices. From Graph 1 it can be appreciated that commodity prices started to increase towards the end of 2004 and exploded over the next few years. The commodity price index kept by the Reserve Bank of Australia went from around 40

<sup>9</sup> Richardson D R (2009) 'The benefits of the mining boom: Where did they go?' *The Australia Institute Technical Brief No 3*, May.

in 2003 to peak at just under 120 in September 2008. It was these increases in commodity prices that drove Australia's terms of trade; however, there would have been some boost with cheap imported goods from China.

According to the Australian Bureau of Statistics (ABS) the terms of trade effect produced a 9 per cent real increase in national income between the December quarter 2004 and the December quarter 2008.<sup>10</sup> That was over and above all the other things happening at the same time; higher employment, higher wages and other incomes, as well as increases in productivity to name some of the main factors that also affect national income.

If the 9 per cent were shared equally it would have represented additional annual per capita income of almost \$4000 per annum. Or if it were distributed pro rata everyone would have received a 9 per cent increase in their incomes. However, the mining boom never worked like that.

The mining boom had its initial impact on the profits of the various mining companies. Shareholders would have received substantial gains, although a lot of the beneficiaries were foreign shareholders and a lot of the paper gains would have been lost since December 2008. After the immediate effects the ripples spread to the mining company suppliers, contractors and workforce through more work and higher incomes. After that the ripples continued with strong local and regional effects in WA and Queensland in particular. However, by the time the ripples reached the rest of us they were so weak as to be imperceptible.

The Secretary of the Treasury, Ken Henry, suggested that Australians would enjoy the benefits of the boom by way of cheaper import prices.<sup>11</sup> However, if your income is indexed to inflation it means you can buy the same bundle of goods and services before and after the boom. Flat panel TVs may have become relatively cheaper but you still couldn't afford one without giving up something else.

For the cheaper import prices to improve anyone's living standards there would have to be a commensurate *real* increase in their incomes. With no more than indexation you are trapped into purchasing the same bundle of goods and services. Groups whose income is adjusted for inflation include those relying on government benefits such as the unemployed.

The main sources of household income are wages and government income support payments. If wage earners were to benefit from the mining boom there would have to be a jump in real wages compared with what they would have been otherwise. That can be tested.

The preferred measure of wages is the wage price index because it tracks what is happening to a fixed composition of jobs. That index was divided by the consumer price index to give a measure of real wages and we looked at how real wages behaved before and after the mining boom.

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<sup>10</sup> ABS (2010) Australian National Accounts: National Income, Expenditure and Product, Dec 2009, Cat no 5206.0, 3 March.

<sup>11</sup> K Henry, 'Revisiting the policy requirements of the terms-of-trade boom', Address to the Australian Business Economists, Sydney, 20 May 2008.

In the four years after the boom real wages increased by slightly more than before the boom. The difference was 0.2 per cent per annum which is only a smidgin above zero.<sup>12</sup> Indeed, if like the Reserve Bank we used an alternative measure of prices that eliminates the volatile components; even that 0.2 per cent disappears. Nevertheless, that 0.2 per cent for four years is well short of the 9 per cent increase in real income supposedly as a result of the mining boom.

While it is hard to identify any improvement in wages using the Australia-wide figures, there is no doubt that wages in some regions and some occupations did increase as a result of the mining boom. For example, average weekly earnings in mining increased by 33 per cent over the four years ending in 2008. On the other hand workers in 'accommodation, cafes and restaurants' received just a 12.3 per cent increase. Those people actually experienced a real wage cut of one per cent. State by State figures are less dramatic but WA wages experienced the greatest increase at 22 per cent compared with the national average of 17.6 per cent.<sup>13</sup>

Most pensions are now indexed to wages or the consumer price index, which ever is larger. The age pension is the biggest of those pensions in terms of the numbers of recipients. The indexation arrangements allow the pension to gradually increase over time in line with community standards. However, this group will not have received any benefit from the mining boom if wages themselves have not benefited from the boom. At most it is the 0.2 per cent discussed above. Again, that is nothing like the 9 per cent apparently due to the mining boom.

The rest of government income support payments are indexed and, as already pointed out, there has been no benefit passed on through that mechanism.

Some households would have benefited through their direct and indirect holdings of shares in mining companies such as BHP Billiton and Rio Tinto. For a while there were some large paper gains, up to 170 per cent in the S&P/ASX Resources index, and even at the end of December 2008 mining shares were still 57 per cent above their 2004 levels.<sup>14</sup> However, share ownership is largely confined to higher income households with the top 20 per cent of households owning 86 per cent of shares.<sup>15</sup>

Even so, share ownership is very skewed among those that do own mining shares. For example, Rio Tinto and BHP Billiton account for 51 per cent of the resources index. Looking closely at those, 67 individual share holders or 0.13 of one per cent of shareholders own 68 per cent of Rio Tinto while 78 share holders or 0.01 of one per cent of shareholders own 59 per cent of BHP. Both have a large number of small owners. Around 130,453 people or 87 per cent of Rio Tinto shareholders own just 8 per cent of Rio Tinto while 308,000 people or 59 per cent of BHP shareholders own just 4 per cent of BHP.<sup>16</sup>

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<sup>12</sup> The details are set out in Richardson (2009).

<sup>13</sup> ABS (2009) Average Weekly Earnings, Australia, November 2008, Cat No 6302.0, 26 February.

<sup>14</sup> RBA Statistical Tables at <http://www.rba.gov.au/statistics/tables/index.html>

<sup>15</sup> ABS (2007) 2005–06 household wealth and wealth distribution, Australia, Cat No 6554.0, 9 November.

<sup>16</sup> Figures taken from BHP Billiton Limited and Rio Tinto Limited Annual Reports.



All of this points to any gains through share ownership being very concentrated among a small number of wealthy shareowners.

While it is hard to identify any gains that flowed to ordinary people, it is possible to identify some negative impacts. As noted above, the value of the Australian dollar increased dramatically with the mining boom. With the strong increase in commodity prices Australia certainly did experience an appreciation in the Australian dollar. It appreciated by 31 per cent against the US dollar. The impact of that was to reduce Australia's competitiveness in other trade exposed areas with manufacturing being particularly hard hit. Upward pressure on the exchange rate reduced the competitiveness of Australian manufacturing, agriculture and services. For example, tourism in North Queensland suffered from the high \$A. Pacific Brands closed down virtually the last of its manufacturing in Australia in 2009. (Pacific Brands makes well known Australian brands from Hush Puppies shoes to Bonds underwear.

In addition to the exchange rate impacts monetary policy was tightened significantly over this period. Most increases in the interest rate were explained at least in part by the increase in commodity prices. The Governor of the Reserve Bank, Glenn Stevens, seemed especially keen to ensure that the mining boom did not spill over into the rest of the economy.

The result was higher interest rates that were spread throughout the Australian economy, and certainly spread more widely than any benefits of the mining boom.

At its peak compared with 2004 higher mortgage interest rates were transferring an additional \$24 billion per annum from the household sector. That was equivalent to a 3 per cent reduction in living standards for the household sector as a whole. New home buyers were the worst affected. For a new home mortgage of \$300,000 taken out by someone on average weekly earnings, the increase in mortgage interest rates would have taken away 12.9 per cent of their post tax earnings by mid 2008.

Some the additional costs would have been returned in the higher deposit interest rates available on a limited number of deposit types. However, for most of the deposits that households are likely to use, interest is not paid or paid at trivial rates.

The importance of this experience is that the resources boom itself did not necessarily make Australians any richer nor did it seem to be associated with other indicators of material wellbeing.

There is a wealth of international literature that does in fact associate resource dependency on worse economic performance. A lot of that literature merely reports statistical associations and so may just reflect the peculiarities of the present constellation of nations in the world rather than any true causal relationships.<sup>17</sup>

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<sup>17</sup> One study looked at 141 countries over the period 1950 to 1990 and found that a one percent increase in resource dependency (measured by the share of mineral exports in total exports) increased the probability of authoritarian government by nearly 8 per cent! See Rosser A (2006) 'The political economy of the resource curse: A literature survey', *Institute of Development Studies Working Paper 268*, April.

### 3 What will Australia look like on the other side of the peak?

The reduction of oil production is likely to be very disruptive to the world's economies given their present dependence on oil.<sup>18</sup> But there are many other commodities whose demise would not seem to matter all that much. For example, gold is an interesting case. *Peak Minerals in Australia* quotes an assessment suggesting that 80 per cent of mined gold becomes jewellery (p. 72). Slower annual output of gold is unlikely to be much of a concern and the existing holders of gold will be only too happy if the value of the gold increases.

Here I want to focus not on how Australia may be affected as a consumer of increasingly scarce commodities but as a producer.

#### Singer-Prebisch thesis

Many earlier writers took it for granted that for an economy to be trapped on a resource-dependent growth trajectory was to be trapped in a low growth economy with slow increases in living standards compared with the rest of the world. This is now known as the Singer-Prebisch thesis. Prebisch is particularly interesting; between 1964 and 1969 was secretary-general of the United Nations Conference on Trade and Development (UNCTAD).

The S-P thesis divides the world into the 'centre' based on the advanced economies of North America and Europe and the 'periphery' countries consisting mainly of primary producers. The main point of this thesis is that the periphery produces primary goods to export to the centre, and the centre produces secondary goods for export to the periphery. As technology improves the centre is able to retain productivity improvements through higher wages and profits. In the periphery by contrast the results of technical progress are reflected in lower final prices that are passed on to consumers in the centre. Unions are weak in the periphery and companies concerned compete against each other by way of price. In the centre competition among large oligopolies generally avoids price competition. For Prebisch the upshot of all this was that the terms of trade tended to move against periphery countries so that they had to export more in order to get the same volume of industrial exports. All the benefits of technology accrued to the centre, the nations engaged in secondary activities rather than the periphery which was doomed to stagnant living standards.

Whether or not we agree with the mechanism S-P suggest is driving the process, the proximate causal mechanism is the long run deterioration on the terms of trade. Peak production is a mechanism that involves greater scarcity of mineral products and so provides a mechanism to reverse the declining long run terms of trade.

We noted earlier the slump in mining productivity and the implication of the peak minerals report is that productivity is likely to underperform the rest of the economy into

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<sup>18</sup> See the Hirsch Report, United States Department of Energy (2005) *Peaking of World Oil Production: Impacts, Mitigation, & Risk Management*, February.

the future.<sup>19</sup> However, the falling productivity hardly mattered in recent years, the commodity price boom more than compensated for the declining productivity.

## The Singer-Prebisch thesis in reverse

Now we turn to the rise in commodity prices and how they offset the productivity slowdown. Graph 1 above showed a massive increase in commodity prices since the eve of the mining boom.

The impact of the global financial crisis is clearly evident in the slump in the index from its peak at 119.5 in September 2008 (the month Lehman Brothers collapsed kicking off the global financial crisis). The index then moved to a low of 77.3 in May 2009. Despite the impact of the global financial crisis, at the end of March 2010 the index stood at 91.8 or approximately 130 per cent higher than it stood on the eve of the boom.

It should be intuitively evident that increased prices will offset the slump in productivity in the case of mining exports. Since 2001-02 mining productivity declined by 41 per cent, however, commodity prices increased by around 130 per cent. Assuming international prices for Australian imports remained constant; the value of imports produced by each mining worker would have increased by 33 per cent. Now some of the international prices for Australian imports would also have increased since Australia does import some commodities. Nevertheless, the example shows that even substantial declines in productivity in mining have most likely been more than offset by the increase in commodity prices.

This is a very important feature of the position at the moment. Using the figures reflecting the recent Australian experience it appears that while output per mine worker has fallen in terms of physical quantities produced, the international purchasing power of that physical product has increased significantly. From the economist's perspective the values are much more interesting than the physical product. Rather than the output of minerals per se we are interested in the international purchasing power of the minerals produced.

Of course the discussion so far assumes production is falling in the context of increasing prices. We might expect that to occur in the context where Australia's Hubbert curves roughly match the international Hubbert curves. In other words we should expect increasing international prices so long as we remain on the downward sloping region of the Hubbert curves.

## Fluctuations in commodity prices

In addition to the long term trend in commodity prices there remains the question of the volatility in commodity prices. We mentioned earlier that volatile prices are likely to be transmitted to the rest of the economy through exchange rates in particular, but also through other ways; fluctuations in incomes, employment, construction and so on.

In the early 1940s as governments were making plans for the post war economy Keynes argued strongly for some sort of commodity price stabilisation mechanism. However, nothing ever came of those proposals. In the meantime producing countries have tried to

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<sup>19</sup> The large gas projects now under consideration may provide an offsetting increase in productivity when they come online—even if the effect is temporary.

manage the fluctuations through cartel arrangements, the best known of which is the Organisation of the Petroleum Exporting Countries or OPEC.

If as seems likely commodity prices are more volatile on the other side of the Hubbert curves then this is a mechanism through which the peak minerals process acts as a negative force on the Australian economy. All sectors will have to accommodate the fluctuations in the currency and other variables brought about by fluctuating commodity prices.

## 4 Policy responses.

First we note that there are a host of policy responses specific to particular commodities. For example, the peak in oil production in Australia has been associated with interest in subsidising substitutes such as ethanol. Likewise there are specific issues to do with shortages in particular metals etc. However, our interest here is with the macroeconomic problems and policy responses.

### Current policy

The policy response to the resources boom has been largely put on hold following the global financial crisis beginning in September 2008. Prior to that the macroeconomic response was to treat the macroeconomic outcome as the government would react to any other episode of ‘overheating’—interest rate increases on the part of the Reserve Bank.

The RBA sought to use high interest rates to offset the macroeconomic impact of the mining boom and to confine the booming economy to the mining states. Between May 2006 and March 2008, the RBA steadily increased official interest rates from 5.50 per cent to 7.25 per cent in seven steps of 0.25 per cent. On each occasion, high or rising commodity prices were mentioned specifically:

- as producing ‘consequent expansionary effects on incomes and spending’
- as ‘adding to the growth in Australia’s national income and spending’
- as ‘add[ing] to incomes and spending in Australia’
- as ‘remain[ing] an important source of stimulus to Australia’s national income and spending’.

More recently, it was almost as if the RBA were targeting the terms of trade when it gave its reasons for interest rate hikes as:

- ‘Australia’s terms of trade are likely to rise further’
- ‘[they] have further strengthened prospects of Australia’s terms of trade’.

The terms of trade were seen by the RBA to be boosting aggregate demand beyond what the Board considered desirable.

To the extent that the RBA was successful in contracting the economy, the spill over from the mining boom on to the rest of Australia would have been offset commensurately. That is, the RBA was using high interest rates to dampen the level of economic activity in the economy to ‘make room’ for the booming mining industry so that, for example, employment growth in other industries would fall and mortgage holders would reduce their consumption spending. High interest rates also have the effect of encouraging capital inflows, which tend to appreciate the exchange rate and thus reinforce the Gregory effect.

### The role of Sovereign Wealth Funds

Australia could implement measures to offset the “resource curse” such as sterilising foreign reserves as Norway does with its Petroleum Fund which invests its overseas earnings in foreign asset markets. These are often referred to as “Sovereign Wealth Funds” or in the discussion below, just ‘petroleum funds’.

On the one hand the virtue of a fund to collect windfall receipts from commodity price fluctuations is that it offsets the pro-cyclical pattern in government receipts and the encouragement of pro-cyclical government spending. Pro-cyclical government spending has the effect of amplifying both booms and busts. For example, towards the end of Australia's long boom and prior to the last election the Howard Government wasted the surge in tax revenue on tax cuts mainly going to the rich. In doing so the Howard Government acted so as to amplify the boom to some extent.<sup>20</sup> However, by quarantining the surge in revenue in some fund the spending temptation is removed from governments. The Future Fund presently serves the purpose of earmarking some government revenue and declaring it unavailable for funding present spending.

SWFs such as the Norwegian petroleum fund play an even more important role. To appreciate the way it works we need to go back a step. In discussions about German war reparations following World War One Keynes described the *transfer mechanism* which can be summarised in the proposition that an international flow of money in one direction encourages a flow of goods and services in the same direction.<sup>21</sup> In that context a flow of currency from the defeated Germany to mainly Britain and France encouraged an equal increase in the flow of goods and services from Germany to the rest of the world. The intervening mechanism was the depreciation in the value of the German currency. In Australia's case the massive increase in foreign receipts from mining exports encouraged an increase in the value of the A\$ and that in turn encouraged an increase in the net flow of goods and services into Australia. In Britain and France in the 1920s producers were threatened by the competition from cheap German exports. The appreciation of the A\$ over the last few years has equally threatened Australian exporters and those that compete against imports.

The resources boom involves an inflow of new money and encourages a flow of goods and services in the same direction. For example, the boom through the appreciation of the A\$ had the effect of increasing Australian imports, especially of manufactures and reducing local manufacturing production. Between 2003-4 and 2008-09 manufacturing shrank from 10.2 to 8.6 per cent of GDP. In addition, more Australians holidayed abroad and fewer overseas tourists arrived in Australia.

Those effects could be offset if we could arrange an equal and opposite flow of money which is what the Norwegian *Government Pension Fund* does. The Government Pension Fund used to be the *The Petroleum Fund of Norway* but here we just refer to the petroleum fund. The petroleum fund collects all the petroleum revenue earned by the Norwegian government through its part ownership of Statoil, its taxes on petroleum companies and other petroleum fees and licensing. The important thing about the petroleum fund is that it is mainly invested offshore—international stocks and bonds and other investments. That is the crucial bit. When oil prices go up there is an initial surge in the money going into Norway, but most of that surge is sent back offshore again so that there is no upward pressure on the Kroner. By reversing the flow of money into Norway there is no transfer mechanism.

Some observers suggest Australia should consider setting up an institution similar to the Norwegian petrol fund.

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<sup>20</sup> See Richardson DR (2009) 'Where has all the revenue gone? To tax cuts for the rich!' *The Australia Institute Technical Brief No 2*, May at <https://www.tai.org.au/?q=node/9&pubid=2062>.

<sup>21</sup> Keynes JM (1919) *The Economic Consequences of the Peace*, London: Macmillan.

The aim of the Norwegian petroleum fund seems to be the accumulation of a sum that will be available when petroleum resources begin to run out. In that way there will be, in theory, a perpetual benefit as a result of the current petroleum reserves. Of course, the Norwegian petroleum revenue is a very large share of government revenue compared with mining revenue in Australia. In a good year the Australian state mining royalties and the Federal resource rent taxes on Australian minerals are unlikely to reach one per cent of GDP.<sup>22</sup> The last year we have for mining royalties Government revenue from petroleum in Norway averaged 18.1 per cent of GDP over the period 2000-06.<sup>23</sup>

Australia is a large order of magnitude different from Norway. Any initiative in Australia that tried to emulate the Norwegian experience would operate on a much smaller scale. Nevertheless if properly managed such a fund could have offset much of the appreciation in the value of the Australian dollar and so could have cushioned the contraction in manufacturing and other trade-exposed industry.

Of course any equal and opposite flow of money would do the same job as a version of the Norwegian petrol fund. For example, on the assumption that Australia will continue to experience resource boom revenues for some time to come perhaps we should be on the look out for some other potential flow of perhaps \$20 to 30 billion per annum. One candidate would be reversing the large inflow of foreign funding accounted for by the Australian banks.

There are other options that could be explored such as encouraging mining companies to invest their revenue surges in offshore assets. Equally government revenue surges attributable to mining could be invested in the Future Fund.

There is also a natural reverse flow associated with some of Australia's resources. For example, some of the gas projects may have very little impact on Australia if they

- Involve capital equipment sourced from abroad,
- Involve very little employment or subcontracting with Australians,
- Have profits accruing to foreign owners.

In that case most of the revenue from operations would be sent abroad as payments to foreign suppliers and income for foreign owners. Little more than government taxation revenue would remain in Australia. The Australian figures would show the export income but would also record payments going overseas again. But even those figures would be notional since most of the money would never be seen in Australia. That would solve the transfer mechanism but is likely to be regarded by most people as unacceptable.

Whatever the exact mechanism, there would seem to be a strong case for seriously examining the options for Australia. Anything that can neutralise the transfer mechanism would have the effect of avoiding the disruption to the rest of the economy that Australia periodically experiences as a result of the resources boom.

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<sup>22</sup> Royalties in 2006-07 were \$6.6 billion according to ABS (2008) Mining Operations, Australia, 2006-07, Cat no 8415.0, 22 July while the Federal Resource Rent Tax was \$1.6 billion for the same year (See Australian Government (2009) Budget Strategy and Outlook, 2009-10 Budget Paper No 1, May). The former would have increased substantially but not the RRT which was expected to raise \$1.7 billion in 2009-10.

<sup>23</sup> International Monetary Fund (2007) *Norway: Selected Issues*, IMF Country Report No 07/197, June at <http://www.imf.org/external/pubs/ft/scr/2007/cr07197.pdf>

## 5 Conclusions

This has been a fairly wide discussion of the macroeconomic implications of peak minerals in Australia.

In 1951 agriculture accounted for just over 30 per cent of Australia's GDP, much bigger than mining has ever been.<sup>24</sup> Today agriculture is 2.6 per cent of GDP.<sup>25</sup> Sixty years ago it would have been inconceivable to imagine agriculture shrinking to less than a tenth of its size as a share of GDP. Yet it happened. That experience should suggest to us that, with time, Australia is capable of absorbing major changes in the composition of its industry. That experience should also make us think twice before we suggest that there is anything in the current mining industry that is critically important to Australia.

Having said that, mining is a big and important part of the Australian economy. Among other things, the incomes (or value added) produced in the mining industry are much higher than the Australian average, despite the rather large fall in mining productivity over the last seven years.

In recent years the mining industry has also been associated with dramatic price increases. They meant massive increases in incomes earned in the sector but also had a downside in the cities. The appreciation of the Australian dollar and the higher interest rates had the effect of squeezing other parts of the economy thereby creating room for the mining boom. Most Australians would have experienced either no benefit or been worse off as a result of the commodity boom.

The peak minerals thesis is going to have major implications for Australia. There used to be a fairly widely held view that in the long run the terms of trade would move against commodities and that countries locked into commodities faced long term stagnation. However, the commodity price boom means that thinking has to be put on hold.

Australia seems to have been sliding down the right hand side of its Hubbert curve. However, that has coincided with the strong commodity prices which have more than offset the slowdown in mining productivity.

Using figures for recent Australian experience it is apparent that the *value* of the output of Australia's mining industry has increased significantly despite a large fall in mining productivity. If the mining productivity continues to decline or grow slowly we will continue to be protected if prices also continue to increase as a result of being on the wrong side of the Hubbert curve.

Much of the policy response to date has involved action on the part of the Reserve Bank of Australia to slow down the economy. The RBA saw the commodity boom as a direct threat to the stability of the Australian economy. They saw the risk of an overheating economy.

The Henry Tax Review is likely to recommend that the resource rent tax be extended to on-shore mining activities and possibly replace the state based royalty arrangements.

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<sup>24</sup> ABS (2004) 'Feature article—100 years of change in Australian industry', *Australian System of National Accounts, 2003-04*, Cat no 5204.0, 10 November.

<sup>25</sup> ABS (2010) *Australian National Accounts: National Income, Expenditure and Product, Dec 2009*, Cat no 5206.0, 3 March.



That would give the Australian tax system a large tax base that is also very volatile. In that context the establishment of a government fund modelled on the Norwegian petroleum fund begins to look attractive.

On the one hand such a fund could act as a means of stabilising the economy by having the government go into surplus when revenues boom but the fund might be available for use when the economy falls into recession.

The proposed fund could also be used to hide resource incomes from the present government and earmark it for use when the minerals run out. While Hubbert curves alert us to the likelihood that mining production will decline, we cannot rely on rising prices to offset that forever. We are not far from the position where alternative energy sources are competitive with fossil fuels, even without subsidies but especially if carbon is appropriately priced.

Depending on the design, something like the petroleum fund also has the benefit of insulating the economy from commodity price fluctuations. In the Norwegian model most investment is offshore so that as money comes into the economy via oil revenues it is then turned around again through offshore investments. In that way the transfer mechanism is avoided thus protecting manufacturing and other trade-exposed industry from appreciating currency.

## References

- ABS (2004) 'Feature article – 100 years of change in Australian industry', *Australian System of National Accounts, 2003-04*, Cat no 5204.0, 10 November.
- ABS (2007) *2005–06 household wealth and wealth distribution, Australia*, Cat No 6554.0, 9 November.
- ABS (2008) *Mining Operations, Australia, 2006-07*, Cat no 8415.0, 22 July
- ABS (2009) *Australian System of National Accounts, 2008-09*, cat no 5204.0, 8 December
- ABS (2010a) *Australian National Accounts: National Income, Expenditure and Product, Dec 2009*, Cat no 5206.0, 3 March
- ABS (2010b) *Average Weekly Earnings, Australia, Nov 2009*, cat no 6302.0, 25 Feb.
- ABS (2010c) *Construction Activity: Chain Volume Measures, Australia, December 2009*, Cat No 8782.0.65.001, 14 April.
- ABS (2010d) *Labour Force, Australia, Detailed, Quarterly, Feb 2010*, Cat no 6291.0.55.003, 17 March
- ABS (2010e) *Mining Indicators, Australia, Sept 2009*, Cat no 8417.0, 11 March
- Australian Government (2009) *Budget Strategy and Outlook, 2009-10 Budget Paper No 1*, May
- BHP Billiton Limited, *Annual Report*, 2009
- K Henry, 'Revisiting the policy requirements of the terms-of-trade boom', Address to the Australian Business Economists, Sydney, 20 May 2008.
- International Monetary Fund (2007) *Norway: Selected Issues, IMF Country Report No 07/197*, June at <http://www.imf.org/external/pubs/ft/scr/2007/cr07197.pdf>
- Keynes JM (1919) *The Economic Consequences of the Peace*, London: Macmillan.
- Reserve Bank of Australia (RBA) (2010) *Index of Commodity Prices*, 1 April at <http://www.rba.gov.au/statistics/frequency/commodity-prices.html>
- Richardson DR (2009) 'The benefits of the mining boom: Where did they go?' *The Australia Institute Technical Brief No 3*, May
- Richardson DR (2009) 'Where has all the revenue gone? To tax cuts for the rich!' *The Australia Institute Technical Brief No 2*, May at <https://www.tai.org.au/?q=node/9&pubid=2062>
- Rio Tinto Limited *Annual Report* 2009.
- Rosser A (2006) 'The political economy of the resource curse: A literature survey', *Institute of Development Studies Working Paper 268*, April.

Topp V, Bloch H and Parham D (2008) *Productivity in the mining industry: Measurement and interpretation*, Productivity Commission Staff Working Paper, December.

United States Department of Energy (2005) *Peaking of World Oil Production: Impacts, Mitigation, & Risk Management*, February

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# Submission on mining taxation

To the Select Committee on New Taxes

David Richardson  
Senior Research Fellow  
The Australia Institute

## **Terms of reference:**

On 30 September 2010, the Select Committee on New Taxes initiated an inquiry into the following matter:

- (a) new taxes proposed for Australia, including:
  - (i) the minerals resource rent tax and expanded petroleum resource rent tax
  - (ii) a carbon tax, or any other mechanism to put a price on carbon, and
  - (iii) any other new taxes proposed by Government, including significant changes to existing tax arrangements;
- (b) the short and long term impact of those new taxes on the economy, industry, trade, jobs, investment, the cost of living, electricity prices and the Federation;
- (c) estimated revenue from those new taxes and any related spending commitments;
- (d) the likely effectiveness of these taxes and related policies in achieving their stated policy objectives;
- (e) any administrative implementation issues at a Commonwealth, state and territory level;
- (f) an international comparison of relevant taxation arrangements;
- (g) alternatives to any proposed new taxes, including direct action alternatives; and
- (h) any other related matter.

This submission seeks to respond to the terms of reference of the inquiry in two parts under the headings 'Minerals Resource Rent Tax' and 'Carbon Tax'.

## Minerals Resource Rent Tax

### *Introduction*

The Australia Institute has undertaken a good deal of research on the Australian mining industry and the related taxation arrangements. This submission should be read in conjunction with the earlier contributions.<sup>1</sup>

The mining industry is one of the most profitable in Australia with total profits (gross operating surplus in 2009–10) of \$81 billion out of a total value added of \$99.5 billion.<sup>2</sup> That is per cent of the value produced in the mining sector is profit (using the broad ABS measure).

Just a few years ago, in 2003–04, total profits were a more modest \$26 billion. Most of the increase since then has been a result of the commodity boom. If not for that, profits might have gone backwards given the decline in mining productivity. Nevertheless, the increase in profit due to high commodity prices is considerable, perhaps around \$55 billion in annual profits.

The mining companies knew that there were strong arguments to the effect that their profits depended on access to resources that are owned by all Australians. Consequently, much more of the additional profits should have gone to the community as a whole—more than the extra to be paid as company tax. And, in principle, the mining industry favoured a profit-related tax as it did not want to be lumbered with higher state royalties that it would still have to pay when commodity prices slump again.

### **The Henry Report**

The Henry Report recommended a ‘resource rent tax’ to cover most minerals in Australia. The Rudd Government agreed and decided to implement the ‘Resource Super Profits Tax’ (RSPT).

The RSPT was to address the decline in the share of mining profits being collected by governments in Australia. The combined share of the two types of mining-specific taxes, state royalties and collections under the Petroleum Resource Rent Tax, has fallen substantially from around 40 per cent of profits on the eve of the mining boom to about 13 per cent currently.<sup>3</sup>

The essential idea of the RSPT was simple; if a mining project is only earning ordinary returns then it would only attract the ordinary company tax. However, where a mine is sitting on a superior resource, super profits are generated just because of the attributes of the mineral deposit and not the attributes of the miners. The super profits arise because a company has access to a resource that is really the property of the people of Australia. In any other industry a super profit would be the signal that would encourage competitors to enter the industry, expand the market and so eliminate the super profits. Competition is expected to work to eliminate super profits unless they are due to something that the competitors do not have access to, in this case superior Australian resources.

As the report put it:

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<sup>1</sup> The most relevant are D Richardson, *The benefits of the mining boom: Where did they go?* The Australia Institute, 9 June 2009; D Richardson, ‘Why we need a resource super profits tax’, *Online Opinion*, 25 May 2010; D Richardson ‘Was the mining boom good for you?’ *Online Opinion*, 19 June 2009.

<sup>2</sup> ABS, *Australian System of National Accounts, 2008-09*, cat no 5204.0, 8 December 2009.

<sup>3</sup> Australian Government, *Australia’s Future Tax System: Report to the Treasurer*, December 2009.

Through the Australian and State governments, the community owns rights to non-renewable resources in Australia and should seek an appropriate return from these resources.

Another attraction of the RSPT for the Henry Report was the fact that the tax base was immobile; it could not be shifted offshore for example. It would be wrong to interpret the Henry Report as saying there would be no reduction in mining activity but instead that any behavioural changes are small and are less than the changes in behaviour of the equivalent collection of some other taxes.

In principle, the tax on super profits arising from access to superior resources should not deter investment or induce other changes in behaviour. However, in practice we are talking not about a large number of competing anonymous companies but about specific companies with their own management styles, their own ideas about playing bluff and so on. This should not be pushed too far but it always needs to be borne in mind that when talking about the reaction of companies, it is specific individuals who may not always react as if economic incentives were all that matter.

An important question then is how much of the rent should be taxed. If all super profits were taxed at 100 per cent, there would be no incentive for the mining company to operate the mine efficiently. As the Henry Report acknowledges, Norway imposes a 78 per cent tax on rents in the petroleum sector which may well be about the rough upper limit for resource rent taxes. The government had instead accepted the Report's recommendation that rents be taxed by way of a separate resources super profits tax of 40 per cent. The RSPT was to be a deduction against company tax so that in the first year of operation, 2012–13, the total tax on rents or super profits would have been 58 per cent. However, as the company tax was to be reduced to 28 per cent by 2014–15, the RSPT would be reduced to 56.8 per cent that year. The Henry Report's agenda is a company tax of 25 per cent, which implies a total tax on super profits of 55 per cent.

While the rates could have been higher, in other ways the RSPT was rather tight. To tax super profits, or profits above a normal rate, the government has to define that normal rate of return on investments. The rate for the Petroleum Resource Rent Tax (PRRT) is the bond rate plus five percent for most expenditure and the bond rate plus 15 per cent for some exploration expenditures. However, for the proposed RSPT the normal rate was just the long bond rate. Given that the long-term bond rate has been around five per cent recently in Australia, the RSPT would have been triggered once the project had repaid its original capital outlay and, in addition, had generated a five per cent return.

Prior to Henry there was speculation that the Australian Government would have to negotiate with the states to abolish their royalty regimes. However, the RSPT scheme intended state royalties and any already announced changes to be deducted against RSPT obligations.

## Pre-election changes

The original RSPT was too much for the big mining companies and they threw everything behind their effort to get rid of it. Not only is the mining industry a powerful lobby but it is largely dominated by three powerful companies; BHP Billiton (BHP), Rio Tinto (RIO) and Xstrata.<sup>4</sup>

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<sup>4</sup> There has recently been a debate about whether regulators should allow banks to grow so big that they cannot be allowed to fail. Maybe there is an argument against letting mining companies to grow so big that they wield enormous political and economic power. In that context it is interesting to observe that the international regulators objected to BHP and Rio combining their iron ore operations.

Incidentally, the miners were also instrumental in sinking the Carbon Pollution Reduction Scheme (CPRS). Mining uses an incredible amount of energy; it is estimated that energy costs account for up to 16 per cent of the value of mining output in Australia.<sup>5</sup> So any price on carbon represents another threat to the mining companies' profits. The Minerals Council of Australia complained about 'massive new costs to mining activity in Australia' and published estimates of job losses. Its claims were ludicrous; it claimed that 66,000 jobs would be lost when total employment in mining is 198,100 people.<sup>6</sup>

On 2 July 2010, the Prime Minister, Julia Gillard, and Treasurer, Wayne Swan, announced the Minerals Resource Rent Tax (MRRT) to replace the RSPT. There were a number of differences but the two main changes were to the structure of the tax. First, the definition of super profits (or rents) was changed to be the bond rate plus seven per cent rather than just the bond rate under the RSPT.

In addition, the actual rate of tax was reduced from 40 per cent to a nominal 30 per cent but, with the addition of a 25 per cent extraction allowance, the 30 per cent becomes an effective 22.5 per cent.

The MRRT also dropped the arrangements for carrying forward losses under the RSPT. Those were complicated arrangements that meant the government would share in loss-making projects but those arrangements were not valued by the mining industry.

The MRRT is now essentially similar to the tax on petroleum under the PRRT but with different rates. Given that Australia already had the PRRT operating as a long-term and well-understood example of a resource rent tax, it may have been inevitable that the final outcome would be similar arrangements for all other minerals. However, an important change is that the MRRT only applies to iron ore and coal. Also announced at the time was an extension of the PRRT to all other oil and gas projects. Apart from iron, coal, oil and gas, most minerals remain free from resource rent tax.

State royalties are also deductible against the MRRT; however, it now seems the miners want Commonwealth protection against any other increases in royalties that the states may impose.<sup>7</sup> It would be silly for the Commonwealth to agree to that. There may well be perfectly good reasons for the states to increase mining taxes, for example to pay for local infrastructure, but should that apply to any increase in payroll tax on miners? It should be left to the states to make their own arrangements with the mining companies.

## Arguments for the mining tax

BHP Billiton announced a pre-tax profit of \$19.6 billion for 2010, up 68 per cent on last year's profit. Net after-tax profit increased by an incredible 116 per cent. And that is basically the case for taxing the super profits of the miners. BHP did not suddenly become a great deal cleverer or more skilful at its business; it increased profit dramatically because the rest of the world, and especially China, wants Australian commodities so badly.

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<sup>5</sup> See C Eren, R Denniss and D Richardson, *Green jobs: what are they and do we need them?* The Australia institute, 7 July 2010.

<sup>6</sup> ABS, *Labour force, Australia, Detailed Quarterly*, Cat no 6291.0.55.003, 16 September 2010.

<sup>7</sup> J Freed and J Kehoe, 'Miners cry foul over rate refunds', *The Australian Financial Review*, 20 October 2010.



BHP earned a very high return on equity at 48 per cent.<sup>8</sup> In a competitive market, high returns are competed away unless the company has some underlying advantage. BHP's advantage is its access to high value Australian (and overseas) resources. In this sense, BHP can be fairly said to enjoy 'monopoly' profits. Of course, this submission is not singling out BHP for special treatment; other corporations could equally be chosen. The point here is that BHP's profits and those of other mining companies reflect the international demand for scarce Australian resources.

There are other considerations. The mining boom gave very little by way of benefit to ordinary Australians. Indeed, prior to the global financial crisis most people would have been affected only by the higher interest rates on their mortgages as the Reserve Bank of Australia (RBA) fought the inflation threat it perceived arising from the commodities boom. Others would have been affected by the appreciation of the Australian dollar that reduced the competitiveness of all other trade-exposed industry in Australia. Outside mining there is little evidence of real incomes being higher than what they would otherwise have been.

A mining tax is a vital mechanism for capturing some of the national gains and distributing them more widely. Of course, the distribution of the gains raises a host of issues and most of us would have different opinions as to the best use for any surge in revenue. Not surprisingly, there has been some debate about how the additional super profits tax should be used, with some emphasis on building up reserves for a post-mining future. The government's response goes some way towards that with its emphasis on infrastructure spending and the infrastructure fund.

As for sharing the benefits of the super profits tax among individual Australians, most will go towards superannuation benefits or lower company taxes that will benefit shareholders, including indirect shareholdings through superannuation. Nothing is expected to change for those on income support. Indeed, the Henry Report has flagged a reduction in pension payments through the use of some alternative indexation arrangements that would be lower and so not keep up with community standards. Likewise, people who rely on wage increases will only benefit to the extent their fortunes reflect the conditions in the mining industry. Other workers may be adversely affected as conditions in their industry worsen from the effects of either tighter monetary policy or the high value of the Australian dollar.

On top of all that, there is little so far from the government that goes toward assisting the sectors that have been adversely affected by the indirect impacts of the mining boom. All other trade-exposed sectors of the Australian economy have had to put up with a loss of competitiveness as the Australian dollar appreciated. Tourism and manufacturing appear to have been particularly hard hit.

A more imaginative approach could have addressed some of the other problems associated with the mining boom, in particular its tendency to squeeze out other sectors such as agriculture, manufacturing, tourism and other trade-exposed sectors. That squeeze follows the large cash flows from mining exports that flowed into Australia and pushed up the exchange rate. A fund that is used to invest offshore can offset the cash inflow and so remove the pressure on the exchange rate as the Petroleum Fund of Norway has done over the years. In addition, by keeping some of the revenue offshore, governments will not be tempted to spend it in a way that could exaggerate the boom.

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<sup>8</sup> BHP Billiton, *Annual Report 2010*. Return on equity is calculated by dividing profit before tax by equity at the beginning of the financial year.

The important point here is not the details of how a mining-boom fund might be set up but a recognition of the principle that if a mining boom is associated with a massive increase in the flow of cash into Australia, this should be offset by the government managing a simultaneous outflow of cash. The build-up of a portfolio of overseas assets is prudent as a means of hedging against a possible future when the mining boom might end, either through a crash in commodity prices or a depletion of the resources.

Indeed, it is not even necessary for the government to undertake all the offshore investment; super funds and other financial institutions could be encouraged to invest in offshore assets. The mining companies themselves might be urged to keep their profits surge offshore. The important thing is that we understand how the Norwegian fund worked and debate the need in Australia to set up a mechanism that would do a similar job.

## Arguments against the mining tax

Obviously, no one likes to be subject to a higher tax and the mining industry is no exception. The miners were always going to cite employment and anything else they could think of to use against the tax. So their first predictable point is that the tax is too heavy and will deter investment and activity in the industry.

A sense of history is needed to inform about these claims. The tax on super profits will still be less than the tax on ordinary profit in the previous resources boom of the late 1970s and early 1980s. Back then the company tax rate was 46 per cent. Royalties, which tended to be at least five per cent of the value of production, were imposed on mining companies as well. A five per cent state royalty would have meant that profit was taxed at a total of 51.4 per cent (if profits are 50 per cent of revenue). Private companies were also subject to an undistributed profits tax.

There were no franking credits then, so by the time the company income was received in the hands of the shareholder, the company income in this example was taxed at 81 per cent for someone on the top personal tax rate of 60 per cent at the time.

By contrast, under the formerly proposed RSPT, a company's super profit was to be taxed at a maximum of 67.9 per cent from the perspective of a shareholder on the top personal tax rate.<sup>9</sup> For a company with ordinary profits and super profits in the ratio 50:50, the company income would be taxed at 57.2 per cent in the hands of the individual on the top rate. Under the MRRT, the maximum tax rate from the perspective of the shareholder is reduced to 58.5 per cent of super profits. Of course, super profits are more narrowly defined and limited to iron, coal, and through the PRRT, oil and gas. Neither the MRRT nor the earlier RSPT approached the tax levels of the 1970s and 1980s yet some of the same companies were the enthusiastic participants then as they have been recently.

One of the arguments the miners have used against the mining tax is that it will drive miners away from Australia. Figures published by the Australian Bureau of Statistics (ABS) show that Australia possesses:

- 38 per cent of the world nickel resources
- 38 per cent of uranium resources
- 33 per cent of the lead

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<sup>9</sup> For each \$100 of super profit, the RSPT was to be \$40, company tax initially at 30 per cent of the remainder (\$60), and then, assuming all the rest is paid as dividends, 46.5 per cent is payable with a franking credit for company tax paid.

- 28 per cent of the zinc
- 25 per cent of the brown coal
- 20 per cent of the silver
- 15 per cent of the iron ore and 13 per cent of the gold.<sup>10</sup>

If Australia had insignificant supplies of those commodities, the mining companies might have a case. But if they really want to be world players in the major commodities, there are few countries other than Australia of any significance.

Looking at those figures and bearing in mind that Australia produces much smaller shares of the world's oil and gas, it appears that the wrong minerals have been exempted from the MRRT and PRRT. With a third or more of all nickel, uranium and lead, perhaps Australia should be thinking of even bolder taxation initiatives for those particular minerals.

'Sovereign risk' is a concept that the miners have re-introduced into the debate. It used to refer to the risk of nationalisation or expropriation in some third-world countries in the past. Nowadays, it seems to refer to just any tax increase that affects a mining company. For example, it was used in the context of the proposed emissions trading scheme. There is, of course, the 'risk' that any democratic country will change tax rates, environmental laws, industrial relations legislation, land rights and a host of other circumstances. But in a democracy, questions about spending and taxing are always subject to debate and change.

While the proposed MRRT is much more generous than the previous RSPT, it should be noted that neither applies until all capital investment has been recovered together with the 'uplift factor'—either the bond rate under the RSPT or the bond rate plus seven per cent under the MRRT. Company tax now applies irrespective of any notion of risk and well before a company has clawed back its initial outlay. By contrast, the MRRT does not kick in until capital has been repaid, and repaid more than in full with the 'uplift factor' equal to the bond rate.

The question of risks is interesting. Even salaried workers take a risk that their employer will be solvent on pay day and when leave and super etc are due. Risk has never been a reason for being light on tax. And it is easy to overstate the risk. A typical mining project does not go ahead until a full assessment of the deposit, the engineering studies, and full costings are undertaken and even then the sponsor will try to line up long-term sales contracts and hedging operations. When returns were lower, iron ore producers for example used to try to get buyers to invest in projects as a means of tying up the customer's long-term support.

Earlier it was mentioned that in order to define super profits or 'rents', the question of normal returns had to be defined. The Henry approach was to assume that normal rates of return are given in the market by the 10-year bond rate. The idea here is that a government bond is risk-free and so its value in the market should reflect the returns investors will accept on a risk-free investment. In theory, investors should want a similar return plus the appropriate risk premium on any other investment, suggesting that, for the investor, there should be no real difference between investing in a government bond and investing in a risk-free mining project.

This sounds reasonable, but in a global economy we need to ask which country exhibits the appropriate 10-year government bond rate. According to *The Economist*, the 10-year bond

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<sup>10</sup> ABS, *Year Book Australia, 2009–10*, Cat no 1301.0, 4 June 2010.

rate is 5.01 per cent in Australia, 2.43 per cent in the US, 2.28 per cent in the euro area, 2.98 per cent in the UK, and 0.87 per cent in Japan.<sup>11</sup>

Given the wide variability in world 10-year government bond rates, the miners would appear to have a legitimate complaint against using the long bond rate. Treasury's theoretically pure argument may not necessarily fit the dirty world of real markets. It is not possible to provide an exact definition of the normal rate of return or an exact means of calculating that rate.

It must be said that these types of criticism are telling. We cannot know exactly where the boundary between normal and super profits lies but, in a global economy, it cannot reflect each of the different 10-year government bond rates. Strangely, the miners have not examined those sorts of issues.

On the other hand, no matter how the MRRT and PRRT are constructed, it is clear that the mining industry at the moment has more than enough capacity to pay. Perhaps that is another way of saying that as long as the tax is profit-related, it probably does not matter much how it is constructed. When the miners are profitable they should pay.

## Other issues

### *Revenue*

To date, the government has published only the net impact of the introduction of the MRRT and the extension of the PRRT, which is expected to be \$10.5 billion in 2012–13 and 2013–14. From these figures, it is not possible to calculate how variations to the MRRT would affect revenue. Treasury might be asked to provide the revenue impact of increasing the MRRT to 40 per cent and extending it to other minerals.

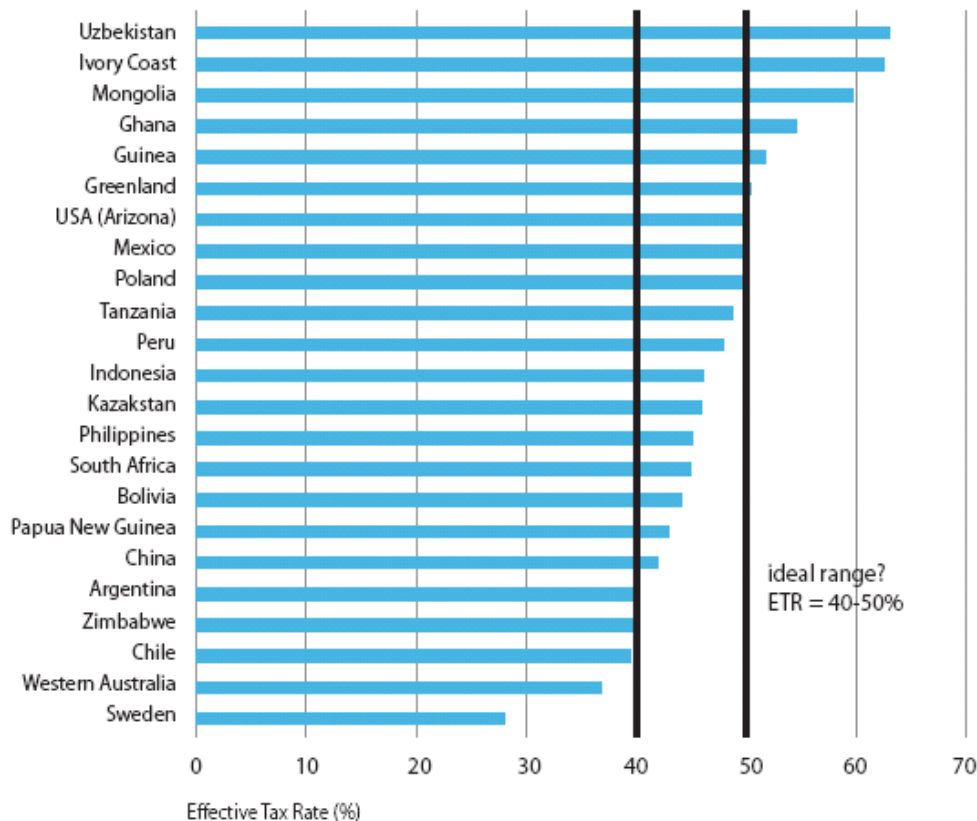
### *International comparisons*

International comparisons are rarely published. The reason is most likely the difficulty of making comparisons between countries when there is a vast difference in the way mining is taxed. Indeed, some other measures are used that can have tax-like effects but act completely differently. For example, some countries operate production-sharing agreements or compulsory sharing of equity in mining projects. In addition, the attributes of the mine itself can influence the tax treatment. However, a recent study done for the OECD compares a hypothetical copper mine in various countries. The relevant graph showing the results is reproduced in the figure below.

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<sup>11</sup> *The Economist*, 18 October 2010.

Figure 1: Effective tax rates on a model copper mine in various countries



Source: P Mitchell, 'Taxation and investment issues in mining', in The Extractive Industries Transparency Initiative, *Advancing the EITI in the mining sector: a consultation with stakeholders*, EITI, 2009.

The results are very interesting. They show that if the model copper mine happened to be in Western Australia, the effective tax rate would be around 37 per cent, the second to bottom on the list of countries included in the study. Moreover, the study finds the ideal range is 40 to 50 per cent, the range in which most countries fall.

Of course, not only is the effective tax rate important, so is the design of the tax system. As the Henry Report argues, resource rent taxes are better than royalties because the latter is a cost to miners whether or not the operation is profitable. Hence a royalty is more likely to deter investors than resource rent taxes, which are more of a profit-sharing arrangement, or indeed, a super-profit-sharing arrangement.

## Conclusion

The need for a heavier tax on mining activities in Australia has a good deal of support at the moment. The miners can easily bear it and their super profits are due the Australian resources they exploit—not their own abilities. If, as suggested in the Henry Report, a rent tax on mining is compared with other income taxes, there would seem to be no contest. The Henry Report outlines a strong case for a resource rent tax.

If implemented, the Henry Report's proposal for an RSPT would have meant that super profits would be taxed at a maximum of 67.9 per cent from the perspective of individual investors. By

comparison, in the last resources boom of the late 1970s early 1980s the tax on all profits in all companies was taxed at 81 per cent for those at the top of the personal income tax scale.

The politics of the RSPT meant that the government watered it down to the presently proposed MRRT, which operates in a similar manner to the PRRT but with a lower effective rate. From the perspective of individuals, that brings the maximum tax on super profits down to 58.5 per cent but super profits are more narrowly defined and exempted for many minerals.

There is a strong case for taxing mining super profits and it seems the miners have got off fairly lightly. At the very least, we might suggest that the MRRT should be increased to 40 per cent, the PRRT rate, and that it should apply universally.

The Henry Report proposed a theoretically pure resource rent tax. The political negotiations that followed resulted in some important compromises and perhaps too many concessions to the mining industry. The biggest anomaly is that the resource rent tax, in practice, has three rates: 40 per cent for oil and gas, 22.5 per cent for iron and coal and zero for all other minerals. It would seem there is an important unfinished agenda here.

## Carbon Tax

- 1) Carbon pollution presents major adverse consequences for the planet.
- 2) For the good of the planet we have to either ban it, in whole or in part, and/or impose financial incentives to reduce it.

If we accept proposition 1, proposition 2 follows pretty well automatically. Economists tend to prefer using price mechanisms as a more efficient way of reducing carbon emissions, but sometimes unequivocal bans or regulation can also have their place.<sup>12</sup>

These propositions seem so obvious that it would almost be insulting to the reader to labour the point. One of the aspects this submission seeks to stress is that a carbon price, however implemented, is likely to involve additional government revenue that can be used for many other purposes, including compensating consumers. We think this situation can be very attractively packaged as we have shown in an earlier paper.<sup>13</sup>

The government's own estimate is that the additional cost per household would be \$6 a week as a result of the direct impact of the \$25 carbon tax on the costs of electricity, gas and other household fuel.

There are also indirect costs to consumers contained in the prices they pay for other commodities. The butcher has power costs that are passed on to consumers; electricity is used to smelt the aluminium that goes into all aluminium products, including cans of soft drink. Adding indirect effects increases the additional cost per household to \$18.50 a week, an increase of 1.1 per cent on the value of all household consumption expenditures.<sup>14</sup> The figure of 1.1 per cent was also the estimate of the total impact on the Consumer Price Index in the government's white paper published in 2008.<sup>15</sup>

People are naturally concerned about power costs and it is true that electricity prices have increased more than other prices over recent years. In the three years to June, prices increased by nine per cent overall but electricity increased by 41 per cent, a good reason for consumer sensitivity to carbon taxes. On the face of it, this is not a good time to add to electricity prices.

Certainly, a carbon tax increases the cost of electricity but, like all other taxes, it can be returned to people. The point is not to punish consumers but to tilt their choices away from carbon-emitting activities. A well-designed program based on a carbon dividend cheque can more than compensate most people for higher electricity costs so long as they don't use excessive amounts of electricity.

A carbon tax at \$25 a tonne would raise \$13 billion. The Australia Institute has conducted some research on how that could be used. Of course it could all just go towards a budget

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<sup>12</sup> The world-wide ban on CFC refrigerants is a good example of a ban that really had no alternative.

<sup>13</sup> R Denniss and D Richardson, *Why a carbon tax is good for the hip pocket*, The Australia Institute, 1 August 2010.

<sup>14</sup> These are The Australia Institute estimates based on ABS, *Australian National Accounts: Input-Output Tables – Electronic Publication 2005-06*, Cat No 5209.0.55.001, 18 November 2009. The input-output tables allow us to track the increased energy costs on other businesses, which eventually flow into higher costs for consumer purchases. Those additional costs are compared with the average household expenditure on consumption goods as reported by the Australian Bureau of Statistics in ABS, *Household Expenditure Survey, 2003-04*, cat no 6530.0, 15 February 2006. Those expenditures in turn are updated to 2011–12 values using CPI estimates from ABS, *Consumer Price Index, Australia, June 2010*, cat no 6401.0, 28 June 2010 plus official inflation forecasts from the *2010–11 Budget Papers*.

<sup>15</sup> Australian Government, *Carbon Pollution Reduction Scheme: Green Paper*, July 2008.



surplus, there are many other options. Company tax could be reduced, the GST could be cut, funding could be directed into alternative energy research and so on. There are many options and it is possible to have combinations of two or more of them. But a very attractive option is the **carbon dividend cheque**.

In an example we examined, the government could pay a family of four a dividend cheque of \$2,100 per annum, perhaps in quarterly instalments to help with utility bills. The extra cost of the higher electricity charges should be around \$18.50 a week making that family \$1,100 better off each year. They would be even better off if they were to use less electricity than average and the higher prices will encourage them to do that. Lower income groups tend to spend less on electricity (less on everything) so they would be even better off on average.

A benefit of \$1,100 a year for an average family of four is a substantial amount. After two years of such savings, a family of four from most places in Australia could have a week's holiday on the Gold Coast.

The Australia Institute's costings are based on giving families \$700 a year for each of the first two family members and half that thereafter. So a family with a large number of children will get even more than the example above.

The Howard Government was able to impose the goods and services tax as part of a package that made most people better off. Exactly the same thing can be done with the carbon tax by using it to fund the carbon dividend cheque. But there is a warning: proposals to give a large proportion of the tax back to the polluters make it much less likely that the bulk of families will be better off.

## Other policies

A carbon price is not the end of the story. A carbon price is not everything. As James Galbraith points out, the fact that Europeans are twice as energy-efficient as Americans reflects a host of factors, not just that Europe is a more energy-efficient version of the US.<sup>16</sup> It reflects the ways Europeans organise their lives, their housing patterns, transport networks and power grids. Those sorts of things cannot fundamentally change as a result of individuals making their own uncoordinated responses to a carbon price.

Business is unlikely to change substantially as a result of carbon prices despite the outstanding efforts of some organisations. We calculate that electricity costs for the average business are around one per cent of production costs according to the latest input-output tables.<sup>17</sup> Thus, for a business to concentrate on energy efficiency measures means it is spending valuable management time on one per cent of the value of production. It therefore seems unrealistic to expect managers to be seriously interested in energy efficiency unless the increase is very large as a result of the carbon price.

If efficiency gains are likely to be limited, the best practical hope is for a substantial substitution of renewable electricity for that produced with fossil fuels. A price on carbon would, in principle, encourage more investment in renewable energy. In practice however, the price incentives can be diluted because much of the industry has oligopolistic structures and is subject to regulatory control with price caps and other mechanisms. In the case of a government-owned

<sup>16</sup> J K Galbraith, *The Predator State*, NY, The Free Press, 2008.

<sup>17</sup> ABS, *Australian National Accounts: Input-output tables—Electronic publication, 2005-06 final*, Cat no 5209.0.55.001, 18 November 2009. We know that electricity costs have increased since then so the figure now may be around 30 per cent higher.



generator able to recover costs through a cost plus formula, there may be very little financial incentive to invest in renewable energy.

Overall, it seems that while a price on carbon is an important step in achieving reductions in emissions, that approach does have limitations and is likely to need supplementary measures.

Before leaving this section there is a semantic issue we should quickly deal with. The Opposition has referred to the carbon price as a big new tax. It may be tempting to try to argue that there is a difference between a price on carbon and a tax but, as the Budget Papers have classified the CPRS as a tax, there seems little point in arguing the contrary. For that reason, price and tax are used interchangeably in this submission.

## Setting a carbon price

Choosing between different types of methods for setting carbon prices is going to involve a lot of considerations. The CPRS involved a sophisticated trading system but it was really a means of auctioning permits to polluters in the context where they could buy extra in the market from those who had purchased excess permits. In addition, speculators were free to enter the market as buyers and sellers. We get the impression that the tail seemed to wag the dog in the sense that secondary trade looked like becoming more important than the initial auction system. Just as the main activity on the stock exchange, the buying and selling of second-hand securities, overwhelms the real function of the stock exchange, which is the flotation of new companies or supplementary capital-raising by existing companies.

The resource cost of running the stock exchange seems high relative to the cost of raising new capital—the real justification of the equity trading system. Recently, the Initial Public Offerings (IPOs) on the Australian Stock Exchange have been low but in the four or five years prior to that averaged around \$15 billion per annum.<sup>18</sup> However, the value of those transactions in new capital is swamped by the swapping of second-hand shares on the exchange. In September 2010, the daily average was a turnover of \$5.6 billion a day,<sup>19</sup> or on an annual basis around \$1,460 billion. Effectively, only one in one hundred transactions by value is raising new capital. The share market is a good example of a tail wagging the dog. Most of the activity has almost nothing to do with raising capital but seems dominated by the wheeling and dealing of short-term traders.

Whatever might be the justification for the stock exchange trading system, it seems curious that we would want to establish a similar system for carbon permits. That would make sense in a market where rights to pollute are grandfathered but transferable.<sup>20</sup> However, the CPRS was always to be based on an auction system. By having both an auction and a trading scheme, there are effectively two market mechanisms. The auctioning of permits is analogous to the auctions under IPOs for newly listed companies. We would expect that fairly soon the permits would be trading among people who, in the main, would not use them. Having auctioned carbon permits there really needs to be a rethink about the need for the extra second-hand market. (The public sector auctions such things as radio frequencies without needing a second-hand frequency market.)

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<sup>18</sup> Australian Securities Exchange, *IPO: The road to growth and opportunity*, Sydney, 2009 at [http://www.asx.com.au/professionals/pdf/asx\\_ipo\\_brochure.pdf](http://www.asx.com.au/professionals/pdf/asx_ipo_brochure.pdf) (accessed 26 October 2010).

<sup>19</sup> Reserve Bank of Australia, *Statistical Tables*, (accessed 26 October 2010).

<sup>20</sup> In this sort of model there is a concern that old polluters should be able to sell to new polluters so that people who can better use the permits can buy the incumbents out of the market.

Of course, a fixed price for carbon also eliminates the need for a wasteful secondary market. Under that model, the government makes the market as a willing seller and buyer at the fixed price, leading naturally to the issue of whether it is better to have a volatile price or volume.

A main feature of the CPRS was that it proposed to set emissions targets and let the price fall where it might. That gets us to the issue of whether we want a system in which price or quantity is volatile. With a fixed price, obviously price is stable but the amount of emissions will vary from year to year as other conditions change. The volume of permits people buy at the set price will change. However, if the volume of permits is fixed, all the adjustment will take place in the price. But in that case, the price of carbon will be volatile causing the electricity price to be volatile as well, making it difficult for investors in electricity generation facilities. Volatile electricity prices prevent investors from making reasonable assumptions about their future returns and create difficulties in convincing a sceptical lender that the project will generate sufficient revenue.

We have already experienced problems with the Renewable Energy Target (RET) with investors in renewable energy being upset by the price fluctuations. As the additional RET certificates came on stream as a result of the incentives for household solar electricity generation, the RET market soured until the government made new arrangements to separate the wholesale and retail aspects of electricity incentives.

That also raises an important issue that The Australia Institute has addressed many times. If there is a scheme, such as the previously proposed CPRS, that sets volumes, a new scheme can be introduced, perhaps at the state government level, which attempts to initiate new carbon reduction measures. That means that, under the set volume, there are now additional places for more emissions from elsewhere. In that case, state-government initiatives are frustrated since they merely free up permits for the other polluters.

As mentioned above, electricity prices have risen substantially in recent years. Part of the reason may have been under-investment in plant in both electricity distribution and generation. There is a widespread belief that the reason for the under-investment is the uncertainty about whether or not there will be a carbon price and what that price will be. It seems to be becoming rather urgent that a carbon price be imposed. If our proposal for a carbon dividend cheque is adopted, individuals can be compensated to cover the price effect of the carbon price as well as much of the recent price increases. The imperative now seems to be the setting of a stable price outlook which argues strongly for a fixed price.

Of course, the fixed price model requires a mechanism to ensure that the price is revised from time to time so that Australia in fact meets its emissions target. However, we would envisage a price that begins at a reasonably modest level but quickly rises to perhaps \$25 a tonne, indexed thereafter. Subsequently, a possible model would involve holding five-yearly inquiries into whether the price remains appropriate.

## Conclusion

This submission takes as given the need for action to address carbon emissions. Indeed, the need for a carbon price or tax seems self-evident. One of our concerns has been to point out that a carbon price does not have to mean just another burden on the people of Australia. Instead, we have advocated a **carbon dividend cheque** as a mechanism for returning the revenue.

We examined the option of paying a carbon dividend cheque to each household at \$700 per annum per person for the first two members of the household and \$350 thereafter. The overwhelming majority of families would be better off under this arrangement and the amount by which they would be better off will depend on their electricity usage. So the carbon price

has the effect of taking from consumers according to how much they use but returning a fixed sum to families according to the number of family members. The strong incentive to economise on electricity remains but most families will be financially better off.

While a carbon price is certainly an important instrument to assist a reduction in carbon emissions, other mechanisms are also important. We have to recognise that there is a limit to what uncoordinated decision-makers can do in response to even strong price signals. For example, electric vehicles are unlikely to be popular unless a government can coordinate and arrange rapid recharging facilities, battery exchange programs and the like. Town planning, research and development initiatives, demonstration programs and so forth are involved. Our submission does not go into these but it is important to recognise their role even with a price on carbon.

While a price on carbon is important, so is the way it is set. The present submission argues that price stability is critical for business decision-making. Generally there is a trade-off between price volatility and quantity volatility. Since it is price stability that makes profit projections more reliable, this submission opts for a set price rather than leaving the market to determine the price.

# Review of the Petroleum Resource Rent Tax Submission

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*Despite huge increases in gas production, revenue derived from the exploitation of our resources is declining. Current arrangements around the PRRT are distorting investment and failing to deliver benefits to the Australian community.*

David Richardson  
Rod Campbell  
February 2017

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Level 1, Endeavour House, 1 Franklin St  
Canberra, ACT 2601  
Tel: (02) 61300530  
Email: [mail@tai.org.au](mailto:mail@tai.org.au)  
Website: [www.tai.org.au](http://www.tai.org.au)

# INTRODUCTION

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The Australia Institute welcomes the opportunity to make a submission to Treasury's Review of the Petroleum Resource Rent Tax (PRRT). The review occurs at a time when Australia is set to become the world's largest gas exporter, yet PRRT revenues are declining. Several major gas projects are unlikely to pay PRRT for decades, according to many analysts, including analysis commissioned by the industry lobby group, APPEA.<sup>1</sup>

The review aims to provide advice on whether the PRRT is operating "as intended". In the current situation with projects unlikely to pay PRRT for many years if ever, either there is no economic rent to be taxed, or the tax is not working as intended.

It is unlikely that multinational gas companies would invest billions in Australian gas projects that would yield no economic rent for decades. Even if this were the case, some of these projects operating in Commonwealth waters pay no royalties for the gas they extract. In other words, they receive gas without paying anything to its owners, the public. These projects that provide no economic rent despite free access to the public's gas resource would fail a cost benefit analysis, returning a negative net present value.

Furthermore, many gas projects benefit from subsidised infrastructure from state governments. As noted by WA Treasury, the North West Shelf project benefited from \$8 billion in taxpayer-funded assistance:

*In 2010 net present value terms, the cost of Western Australia's assistance to the North West Shelf project (e.g. payment of subsidies to the State's power utility to help cover the losses it initially incurred under crucial 'take or pay' gas contracts) is estimated to be around \$8 billion.*<sup>2</sup>

Projects that deliver no economic rent, pay no PRRT, no royalties and receive subsidised infrastructure and other assistance are not the 'marginal project' that the PRRT aims to facilitate. They are sub-marginal, reduce the welfare of the Australian public and should not be pursued. In such cases it appears the current system works to distort investment and incentivise sub-marginal projects.

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<sup>1</sup> Wood Mackenzie (2017) *Independent Report on the PRRT Review in Australia*, <http://www.treasury.gov.au/~media/Treasury/Consultations%20and%20Reviews/Reviews%20and%20Inquiries/2016/Review%20of%20Petroleum%20Resource%20Rent%20Tax/Submissions/PDF/Australia%20Petroleum%20Production%20and%20Exploration%20Association%20APPEA.ashx>

<sup>2</sup> WA Treasury (2011) *GST Distribution Review WA Submission*, p13, [http://www.gstdistributionreview.gov.au/content/submissions/downloads/interim\\_reports/WA-Submission.pdf](http://www.gstdistributionreview.gov.au/content/submissions/downloads/interim_reports/WA-Submission.pdf)

Far more likely, however, is the possibility that the current system is simply failing to capture the economic rents that major gas projects deliver to their owners. Several key flaws that allow this to occur are outlined below.

## UPLIFT FACTOR

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The uplift factor applying to the PRRT is 15 per cent plus the long-term bond rate. As the Parliamentary Budget Office has recently reported, six per cent is the appropriate figure for the Government's assumed long-term cost of borrowing. That means an expected uplift factor into the future of 21 per cent. At that rate the value of any deductions doubles every 3.6 years and in ten years will increase 6.7 times.

The PRRT does not need such a high uplift factor. Industry proponents claim this is necessary to compensate for the risk of hydrocarbon exploration. However this argument is overstated. Exploration like many other 'investments' behaves like an 'S' shaped function over time; it starts off very small, increases rapidly and then levels off until the 'investment' is complete.

Real options theory explains that and we can see it intuitively. Small initial expenditures are made so as to be able to estimate the option value of committing further funds into the venture. Having made an initial assessment the decision is to shelve the project or continue further. As further steps are made and if the assessments are further suggestive of a good viable project in the future then further definition of the deposit is made. In this way the project is always able to be dropped but the decision to proceed at each step is subject to less and less risk. Hence for the exploration of a prospective operation, the risk of the first dollar of exploration spending may be very high but the last dollar of exploration spending is much less risky. Towards the end the exploration spending is more likely to involve working out the best way of exploiting the resource.

The industry focuses its lobbying on the early speculative exploration spending, but the reality is that much exploration spending is not high-risk. For that reason the uplift factor should be the same as for other expenses. The bond rate plus five per cent is too generous and should be subject to a cap of perhaps nine per cent.

**Recommendation: The uplift factor be replaced by a common rate.**

## PROJECT LEVEL

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The fact that exploration and other spending can be offset against other projects adds a serious distortion to the market. That means an entity with a profitable project that actually pays the PRRT has a greater incentive to explore new fields than a company without such a project/s. The taxable unit for the PRRT should be limited to the project in question and not transferable to unrelated projects.

**Recommendation: The PRRT should continue to be imposed at the project (or production licence area) level and exploration deductions and uplift not applied to other projects.**

## PRRT AND OTHER TAXES AND CHARGES.

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The PRRT is sometimes presented as an alternative to royalties and other charges on mining companies. However, the two are levied for entirely different reasons. Royalties are akin to a sale of the commodity in question and may well be tailored to recover government costs, much the same as a road usage and congestion charge reflects similar costs to the community. Where projects are not currently subject to a royalty, not only is the community not deriving a benefit from the exploitation of its resource, but this makes competition between gas producers unfair for those paying a royalty.

The PRRT by contrast is designed to capture for the community the super profits attributable to the uniquely favourable character of a particular deposit. Nevertheless any other levies would be a legitimate deduction against any PRRT liability.

**Recommendation: The PRRT should operate in conjunction with other tax arrangements that may be imposed for other reasons.**

## THE PRRT RATE

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Once the operator's reasonable costs (including the going rate of return) are covered, any additional revenue is unnecessary to attract the operator and so can be taken by the government without affecting the incentive to operate that project. In principle all the super profit should be returned to the people who own the superior resource. If we acknowledge that the PRRT is a mechanism for recovering the benefit of the



resource for the community then it is unnecessary to share over half of the super profit with the operator. However, just enough has to be left with the operator so there remains some incentive to operate efficiently. Experience in countries like Norway suggests the total tax on profits can approach 90 per cent without deterring investment. Australia could well implement a two tier arrangement with the rate increasing after (say) twice the uplifted capital value has been recouped.

**Recommendation: The current 40 per cent PRRT should be increased to 70 per cent on projects that have earned double the uplifted value of their capital outlays.**

## OVERSEAS COMPARISON

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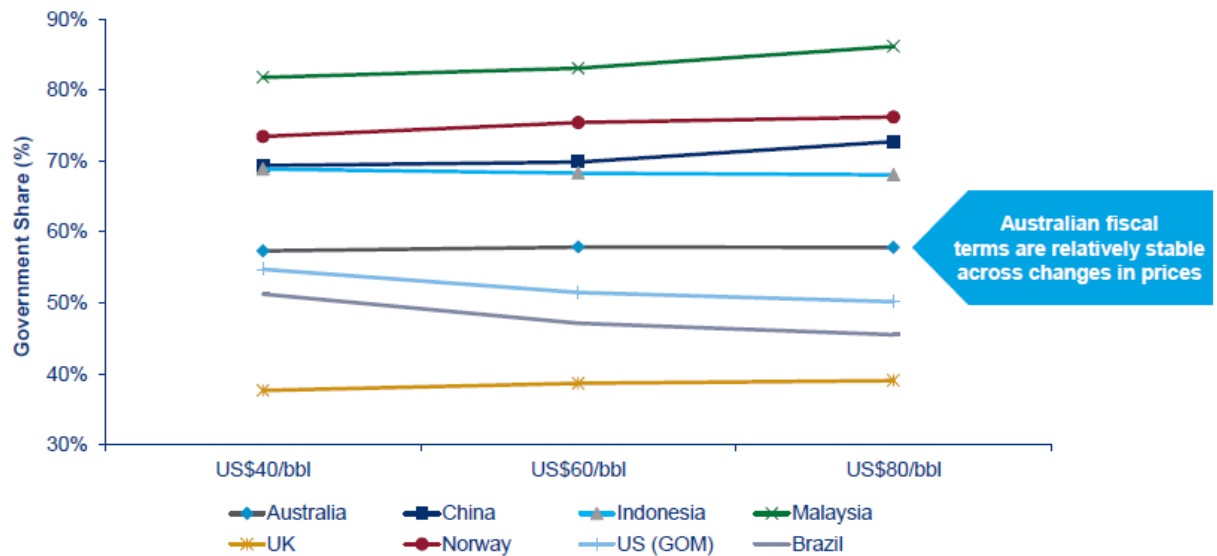
Unlike the current campaign by the federal government and business community to lower company tax, we rarely see the petroleum industry compare Australia's tax regime for oil and gas with the rest of the world. The reason is that most other countries with hydrocarbon deposits have ownership vested in the State and require joint ventures, partnerships, production sharing and other arrangements to be made with the relevant government/s or state-owned oil companies. The implied company/PRRT equivalent overseas is often very many times the Australian rate.

For example, in the UAE the general company tax rate is zero but is 50 per cent in the case of companies in the oil and gas sectors. Norway imposes a 78 per cent tax on super profits in the petroleum sector, a figure that does not include royalties, production/profit sharing and other arrangements, as noted in APPEA's submission to this review and the Henry Tax review.<sup>3</sup> In fact, APPEA's submission includes analysis that confirms that Australia's arrangements provide little return to government relative to other countries, reproduced in Figure 1 below:

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<sup>3</sup> Wood Mackenzie (2017) *Independent Report on the PRRT Review in Australia*, p31.

**Figure 1: International comparison of government share of oil project benefits**



Source: Wood Mackenzie (2017) *Independent Report on the PRRT Review in Australia*, p33, report commissioned by APPEA.

Figure 1 shows that countries well known for oil and gas extraction such as Malaysia and Norway derive far greater shares of project benefits than Australia, yet have no trouble attracting investment in their oil and gas sector.

## CONCLUSION

At best, Australia's arrangements for royalty collection and taxation of our oil and gas resources are encouraging sub-economic projects to be developed. More likely, the Australian public is losing billions in revenue, reducing our economic welfare and standards of living.

This review is timely and can help to address this situation by recommending a reduction in the uplift factor, elimination of transferability of uplift, imposing a royalty on all oil and gas extraction and increasing the rate of the PRRT. This would see Australians share the benefits of their resources to a similar extent as already occurs in countries like Indonesia, Norway and Malaysia.

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# **The MRRT should not be abolished**

Submission to the Senate Inquiry into  
Minerals Resource Rent Tax Repeal and  
Other Measures Bill 2013

Submission  
November 2013

David Richardson and Richard Denniss

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Research that matters.

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Unit 1, Level 5, 131 City Walk  
Canberra City, ACT 2601  
Tel: (02) 6130 0530  
Email: [mail@tai.org.au](mailto:mail@tai.org.au)  
Website: [www.tai.org.au](http://www.tai.org.au)

## Summary

The Senate has invited submissions on the draft amendments to the *Minerals Resource Rent Tax Repeal and Other Measures Bill* 2013. This submission comments on the repeal of the tax and the ‘other measures’.

The direction of the present set of changes greatly advantages a small number of large companies including some foreign-owned corporations worth hundreds of billions of dollars. To fund the repeal of the MRRT with the consequential measures mentioned below will hurt millions of households, up to 10 million workers and hundreds of thousands of small businesses.

Three of the beneficiaries of the MRRT repeal are BHP Billiton, Rio Tinto and Glencore (owns Xstrata) together worth more than \$200 billion. These are all members of the Business Council of Australia and are majority, majority and completely foreign-owned respectively.

By contrast the losers from the package are all workers with compulsory superannuation contributions, millions of households with children and hundreds of thousands of small businesses. The overall numbers include around 8.2 million people who have super contributions made by their employers and around 1.5 million people of workforce age who rely on income support payments.

The Labor Government may well have associated the mining tax with various other measures such as the superannuation initiatives when the mining tax was introduced. The government wants to continue to keep treating them as a package. In principle it makes no difference how or when an initiative comes about, such initiatives should stand or fall on their own merits. No matter how worthy the measures up for repeal in the present context, there remain less worthwhile items in the federal budget.

Nevertheless, the 2012-13 budget referred to ‘spreading the benefits of the boom’ and included some of the measures that are proposed to be repealed. We have argued elsewhere that with limited exceptions the boom did not spread much further than those immediately involved<sup>1</sup> and so it was important to spread the benefits to others in the community. When events as disruptive as the mining boom come along there is indeed a challenge for governments to ameliorate the negative impacts and to spread the positives.

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<sup>1</sup> Richardson D and Denniss R (2011) *Mining the truth: The rhetoric and reality of the commodities boom*, The Australia Institute Paper No 7, September.

## The Minerals Resource Rent Tax

The most important thing to say up front is that the MRRT should not be abolished.

The mining industry is one of the most profitable in Australia with total profits (gross operating surplus in 2011–12) of \$84 billion out of a total value added of \$133.0 billion.<sup>2</sup> That is, 63 per cent of the value produced in the mining sector is profit (using the broad Australian Bureau of Statistics measure).

Just a few years ago, in 2003–04, total profits were a more modest \$26 billion. Most of the increase since then has been a result of the commodity boom. If not for that, profits might have gone backwards given the decline in mining productivity. Nevertheless, the increase in profit due to high commodity prices is considerable, perhaps around \$55 billion in annual profits.

The mining companies knew that there were strong arguments to the effect that their profits depended on access to resources that are owned by all Australians. Consequently, much more of the additional profits should have gone to the community as a whole—more than the extra to be paid as company tax. And, in principle, the mining industry favoured a profit-related tax as it did not want to be lumbered with higher state royalties that it would still have to pay when commodity prices slump again.

### The Henry Report

The Henry Report recommended a ‘resource rent tax’ to cover most minerals in Australia. The Rudd government agreed and decided to implement the ‘Resource Super Profits Tax’ (RSPT).

The RSPT was to address the decline in the share of mining profits being collected by governments in Australia. The combined share of the two types of mining-specific taxes, state royalties and collections under the Petroleum Resource Rent Tax, has fallen substantially from around 40 per cent of profits on the eve of the mining boom to about 13 per cent currently.<sup>3</sup>

The essential idea of the RSPT was simple; if a mining project is only earning ordinary returns then it would only attract the ordinary company tax. However, where a mine is sitting on a superior resource, super profits are generated just because of the attributes of the mineral deposit and not the attributes of the miners. The super profits arise because a company has access to a resource that is really the property of the people of Australia. In any other industry a super profit would be the signal that would encourage competitors to enter the industry, expand the market and so eliminate the super profits. Competition is expected to work to eliminate super profits unless they are due to something that the competitors do not have access to; in this case superior Australian resources.

As the report put it:

*Through the Australian and State governments, the community owns rights to non-renewable resources in Australia and should seek an appropriate return from these resources.*

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<sup>2</sup> ABS, *Australian System of National Accounts, 2008-09*, cat no 5204.0, 8 December 2009.

<sup>3</sup> Australian Government, *Australia’s Future Tax System: Report to the Treasurer*, December 2009.

Another attraction of the RSPT for the Henry Review was the fact that the tax base was immobile; it could not be shifted offshore for example. It would be wrong to interpret the Henry Report as saying there would be no reduction in mining activity but instead that any behavioural changes are small and are less than the changes in behaviour of the equivalent collection of some other taxes.

In principle, the tax on super profits arising from access to superior resources should not deter investment or induce other changes in behaviour. However, in practice we are talking not about a large number of competing anonymous companies but about specific companies with their own management styles, their own ideas about playing bluff and so on. This should not be pushed too far but it always needs to be borne in mind that when talking about the reaction of companies, it is specific individuals who may not always react as if economic incentives were all that matter.

An important question then is how much of the rent should be taxed. If all super profits were taxed at 100 per cent, there would be no incentive for the mining company to operate the mine efficiently. As the Henry Report acknowledges, Norway imposes a 78 per cent tax on rents in the petroleum sector which may well be about the rough upper limit for resource rent taxes. The government had instead accepted the Report's recommendation that rents be taxed by way of a separate resources super profits tax of 40 per cent. The RSPT was to be a deduction against company tax so that in the first year of operation, 2012–13, the total tax on rents or super profits would have been 58 per cent. However, as the company tax was to be reduced to 28 per cent by 2014–15, the RSPT would have been reduced to 56.8 per cent that year. The Henry Report's agenda is a company tax of 25 per cent, which implied a total tax on super profits of 55 per cent.

While the rates could have been higher, in other ways the RSPT was rather tight. To tax super profits, or profits above a normal rate, the government has to define that normal rate of return on investments. The rate for the Petroleum Resource Rent Tax (PRRT) is the bond rate plus five percent for most expenditure and the bond rate plus 15 per cent for some exploration expenditures. However, for the proposed RSPT the normal rate was just the long bond rate. Given that the long-term bond rate has been around 3.5 to 4.0 per cent recently in Australia, the RSPT would have been triggered once the project had repaid its original capital outlay and, in addition, had generated a five per cent return.

Prior to Henry there was speculation that the Australian Government would have to negotiate with the states to abolish their royalty regimes. However, the RSPT scheme intended state royalties and any already announced changes to be deducted against RSPT obligations.

### Pre-election (2010) changes

The original RSPT was too much for the big mining companies and they threw everything behind their effort to get rid of it. Not only is the mining industry a powerful lobby but it is largely dominated by three powerful companies; BHP Billiton (BHP), Rio Tinto (RIO) and Xstrata.<sup>4</sup>

Incidentally, the miners were also instrumental in sinking the Carbon Pollution Reduction Scheme (CPRS). Mining uses an incredible amount of energy; it is estimated that energy

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<sup>4</sup> There has recently been a debate about whether regulators should allow banks to grow so big that they cannot be allowed to fail. Maybe there is an argument against letting mining companies to grow so big that they wield enormous political and economic power. In that context it is interesting to observe that the international regulators objected to BHPB and Rio combining their iron ore operations.

costs account for up to 16 per cent of the value of mining output in Australia.<sup>5</sup> So any price on carbon represents another threat to the mining companies' profits. The Minerals Council of Australia complained about 'massive new costs to mining activity in Australia' and published estimates of job losses. Its claims were ludicrous; it claimed that 66,000 jobs would be lost when total employment in mining is 198,100 people.<sup>6</sup>

On 2 July 2010, the Prime Minister, Julia Gillard, and Treasurer, Wayne Swan, announced the Minerals Resource Rent Tax (MRRT) to replace the RSPT. There were a number of differences but the two main changes were to the structure of the tax. First, the definition of super profits (or rents) was changed to be the bond rate plus seven per cent rather than just the bond rate under the RSPT.

In addition, the actual rate of tax was reduced from 40 per cent to a nominal 30 per cent but, with the addition of a 25 per cent extraction allowance, the 30 per cent becomes an effective 22.5 per cent.

The MRRT also dropped the arrangements for carrying forward losses under the RSPT. Those were complicated arrangements that meant the government would share in loss-making projects but those arrangements were not valued by the mining industry.

The MRRT is now essentially similar to the tax on petroleum under the PRRT but with different rates. Given that Australia already had the PRRT operating as a long-term and well-understood example of a resource rent tax, it may have been inevitable that the final outcome would be similar arrangements for all other minerals. However, an important change is that the MRRT only applies to iron ore and coal. Also announced at the time was an extension of the PRRT to all other oil and gas projects. Apart from iron, coal, oil and gas, most minerals remain free from resource rent tax.

State royalties are also deductible against the MRRT; however, the miners wanted Commonwealth protection against any other increases in royalties that the states may impose.<sup>7</sup> The original Commonwealth position was that it would only allow deductions against the mining taxes for royalty increases already in the pipeline or otherwise expected. For example pre-existing indexation arrangements were to be honoured. The ideal Henry model would have the states vacate the field so that the resource rent tax would replace royalties altogether. That seems to have been dropped from the negotiations and now the states can increase royalties on coal and iron ore and simply reduce the MRRT retained by the Commonwealth. Hence there is no discipline on the states not to increase royalty rates.

The Commonwealth should act to limit the amount of royalties mining companies can credit against the MRRT. That way any increase in royalties would be a net new impost on the mining companies which may well make good sense for the state concerned but need not be at the expense of the Commonwealth.

### Arguments for the mining tax

Over the past five years BHP Billiton (BHPB) announced a pre-tax profit ranging between US\$12,160 million in 2009 to a high of \$31,816 million in 2011. From the high to the low that is an increase of Net after-tax profit increased by an incredible 162 per cent. And that is

<sup>5</sup> See C Eren, R Denniss and D Richardson, *Green jobs: what are they and do we need them?* The Australia institute, 7 July 2010.

<sup>6</sup> ABS, *Labour force, Australia, Detailed Quarterly*, Cat no 6291.0.55.003, 16 September 2010.

<sup>7</sup> J Freed and J Kehoe, 'Miners cry foul over rate refunds', *The Australian Financial Review*, 20 October 2010.



basically the case for taxing the super profits of the miners. BHPB did not suddenly become a great deal cleverer or more skillful at its business; it increased profit dramatically because the rest of the world, and especially China, wants Australian commodities so badly. BHPB was more profitable because of Australia's resources—nothing to do with BHPB.

BHPB earned a very high return on equity at 48 per cent.<sup>8</sup> In a competitive market, high returns are competed away unless the company has some underlying advantage. BHPB's advantage is its access to high value Australian (and overseas) resources. In this sense, BHPB can be fairly said to enjoy 'monopoly' profits. Of course, this submission is not singling out BHPB for special treatment; other corporations could equally be chosen. The point here is that BHPB's profits and those of other mining companies reflect the international demand for scarce Australian resources.

There are other considerations. The mining boom gave very little by way of benefit to ordinary Australians. Indeed, prior to the global financial crisis most people would have been affected only by the higher interest rates on their mortgages as the Reserve Bank of Australia (RBA) fought the inflation threat it perceived arising from the commodities boom. Others would have been affected by the appreciation of the Australian dollar that reduced the competitiveness of all other trade-exposed industry in Australia. Outside mining there is little evidence of real incomes being higher than what they would otherwise have been.

A mining tax is a vital mechanism for capturing some of the national gains and distributing them more widely. The initial plan was to use the MRRT revenues to fund a reduction in company tax rates and a gradual increase in the superannuation guarantee from 9 to 12 per cent of wages. However, by the time of the 2012-13 budget<sup>9</sup> new measures were announced including increases in family payments, a new supplementary allowance for those on income support, the school-kids bonus. In addition to that additional assistance was announced to assist families meet higher living costs as a result of the carbon tax. As it happened the company tax rate was not reduced from 30 per cent.

A more imaginative approach could have addressed some of the other problems associated with the mining boom, in particular its tendency to squeeze out other sectors such as agriculture, manufacturing, tourism and other trade-exposed sectors. That squeeze follows the large cash flows from mining exports that flowed into Australia and pushed up the exchange rate. A fund that is used to invest offshore can offset the cash inflow and so remove the pressure on the exchange rate as the Petroleum Fund of Norway has done over the years. In addition, by keeping some of the revenue offshore, governments will not be tempted to spend it in a way that could exaggerate the boom.

The important point here is not the details of how a mining-boom fund might be set up but recognition of the principle that if a mining boom is associated with a massive increase in the flow of cash into Australia, this should be offset by the government managing a simultaneous outflow of cash. The build-up of a portfolio of overseas assets is prudent as a means of hedging against a possible future when the mining boom might end, either through a crash in commodity prices or a depletion of the resources.

Indeed, it is not even necessary for the government to undertake all the offshore investment; super funds and other financial institutions could be encouraged to invest in offshore assets. The mining companies themselves might be urged to keep their profits surge offshore. The important thing is that we understand how the Norwegian fund worked and debate the need in Australia to set up a mechanism that would do a similar job.

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<sup>8</sup>BHP Billiton, *Annual Report 2010*. Return on equity is calculated by dividing profit before tax by equity at the beginning of the financial year.

<sup>9</sup> 2012-13 Budget Paper No 1.

## Arguments against the mining tax

Obviously, no one likes to be subject to a higher tax and the mining industry is no exception. The miners were always going to cite employment and anything else they could think of to use against the tax. So their first predictable point is that the tax is too heavy and will deter investment and activity in the industry.

A sense of history is needed to inform about these claims. The tax on super profits will still be less than the tax on ordinary profit in the previous resources boom of the late 1970s and early 1980s. Back then the company tax rate was 46 per cent. Royalties, which tended to be at least five per cent of the value of production, were imposed on mining companies as well. A five per cent state royalty would have meant that profit was taxed at a total of 51.4 per cent (if profits are 50 per cent of revenue). Private companies were also subject to an undistributed profits tax.

There were no franking credits then, so by the time the company income was received in the hands of the shareholder, the company income in this example was taxed at 81 per cent for someone on the top personal tax rate of 60 per cent at the time.

By contrast, under the formerly proposed RSPT, a company's super profit was to be taxed at a maximum of 67.9 per cent from the perspective of a shareholder on the top personal tax rate.<sup>10</sup> For a company with ordinary profits and super profits in the ratio 50:50, the company income would be taxed at 57.2 per cent in the hands of the individual on the top rate. Under the MRRT, the maximum tax rate from the perspective of the shareholder is reduced to 58.5 per cent of super profits. Of course, super profits are more narrowly defined and limited to iron, coal, and through the PRRT, oil and gas. Neither the MRRT nor the earlier RSPT approached the tax levels of the 1970s and 1980s yet some of the same companies were the enthusiastic participants then as they have been recently.

One of the arguments the miners have used against the mining tax is that it will drive miners away from Australia. Figures published by the Australian Bureau of Statistics (ABS) show that in 2009 Australia possessed:

- 35 per cent of the world nickel resources
- 47 per cent of uranium resources
- 36 per cent of the lead
- 25 per cent of the zinc
- 25 per cent of the recoverable brown coal
- 16 per cent of the silver
- 17 per cent of the iron ore and
- 16 per cent of the gold.<sup>11</sup>

If Australia had insignificant supplies of those commodities, the mining companies might have a case. But if they really want to be world players in the major commodities, there are few countries other than Australia of any significance.

Looking at those figures and bearing in mind that Australia produces much smaller shares of the world's oil and gas, it appears that the wrong minerals have been exempted from the

<sup>10</sup> For each \$100 of super profit, the RSPT was to be \$40, company tax initially at 30 per cent of the remainder (\$60), and then, assuming all the rest is paid as dividends, 46.5 per cent is payable with a franking credit for company tax paid.

<sup>11</sup> ABS (2012) *Year Book Australia, 2011-12*, Cat no 1301.0, 24 May 2010.

MRRT and PRRT. With a third or more of all nickel, uranium and lead, perhaps Australia should be thinking of even bolder taxation initiatives for those particular minerals.

‘Sovereign risk’ is a concept that the miners have re-introduced into the debate. It used to refer to the risk of nationalisation or expropriation in some third-world countries in the past. Nowadays, it seems to refer to just any tax increase that affects a mining company. For example, it was used in the context of the proposed emissions trading scheme. There is, of course, the ‘risk’ that any democratic country will change tax rates, environmental laws, industrial relations legislation, land rights and a host of other circumstances. But in a democracy, questions about spending and taxing are always subject to debate and change.

While the proposed MRRT is much more generous than the previous RSPT, it should be noted that neither applies until all capital investment has been recovered together with the ‘uplift factor’—either the bond rate under the RSPT or the bond rate plus seven per cent under the MRRT. Company tax now applies irrespective of any notion of risk and well before a company has clawed back its initial outlay. By contrast, the MRRT does not kick in until capital has been repaid, and repaid more than in full with the ‘uplift factor’ equal to the bond rate.

The question of risks is interesting. Even salaried workers take a risk that their employer will be solvent on pay day and when leave and super etc. are due. Risk has never been a reason for being light on tax. And it is easy to overstate the risk. A typical mining project does not go ahead until a full assessment of the deposit, the engineering studies, and full costings are undertaken and even then the sponsor will try to line up long-term sales contracts and hedging operations. When returns were lower, iron ore producers for example used to try to get buyers to invest in projects as a means of tying up the customer’s long-term support.

Earlier it was mentioned that in order to define super profits or ‘rents’, the question of normal returns had to be defined. The Henry approach was to assume that normal rates of return are given in the market by the 10-year bond rate. The idea here is that a government bond is risk-free and so its value in the market should reflect the returns investors will accept on a risk-free investment. In theory, investors should want a similar return plus the appropriate risk premium on any other investment, suggesting that, for the investor, there should be no real difference between investing in a government bond and investing in a risk-free mining project.

This sounds reasonable, but in a global economy we need to ask which country exhibits the appropriate 10-year government bond rate. According to *The Economist*, the 10-year bond rate is 3.91 per cent in Australia, 2.49 per cent in the US, 1.77 per cent in the euro area, 2.63 per cent in the UK, and 0.61 per cent in Japan.<sup>12</sup>

Given the wide variability in world 10-year government bond rates, the miners would appear to have a legitimate complaint against using the long bond rate. Treasury’s theoretically pure argument may not necessarily fit the dirty world of real markets. It is not possible to provide an exact definition of the normal rate of return or an exact means of calculating that rate.

It must be said that these types of criticism are telling. We cannot know exactly where the boundary between normal and super profits lies but, in a global economy, it cannot reflect each of the different 10-year government bond rates. Strangely, the miners have not examined those sorts of issues.

On the other hand, no matter how the MRRT and PRRT are constructed, it is clear that the mining industry at the moment has more than enough capacity to pay. Perhaps that is

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<sup>12</sup> *The Economist*, 18 October 2010.

another way of saying that as long as the tax is profit-related, it probably does not matter much how it is constructed. When the miners are profitable they should pay.

The mining industry has recently put the view that it should not have to pay the MRRT because it already makes a large contribution to the communities in which it operates. For example the Chief Executive of the Minerals Council of Australia, Mitch Hooke, recently issued a press release referring to the mining industry's 'community spending' in which he claimed:

*A survey of 25 Australian mining companies, explorers and resources contractors by Corporate Social Responsibility consultants Banarra found that \$34.7 billion was spent on community infrastructure, Indigenous contractors, local suppliers and other activities in 2011-12.<sup>13</sup>*

While only 25 companies were surveyed those companies included the big ones such as BHP Billiton, Rio Tinto, Glencore Newcrest and Newman to name a few. It also included some smaller exploration companies and mining service companies.<sup>14</sup> Given these companies it is likely the survey included half or more of the value added in Australian mining. The biggest single category is payments to local and indigenous suppliers and contractors worth \$34.4 billion or 98.8 per cent of the total. What that means is the mining industry is including inputs into their business as a 'community benefit'. The definition of local was left up to the person filling out the survey. One respondent defined local as 'those who are directly associated with the operations and located within Australia, providing means for the company to continue with our business operations'.<sup>15</sup> If every Australian industry did that then according to the input output tables, Australian industry could claim they generate community benefits of just under twice Australia's GDP.<sup>16</sup> For example, while the mining industry might claim its purchases are 'community benefits' the electricity generating sector could likewise claim that its spending on coal supplies is a 'community benefit'.

The remaining 'community benefits' include 'land access related payments' which are problematic. The item education and training for non-employees includes items such as engineering scholarships. Community infrastructure included items such as airport operations and maintenance and accommodation. These are items many people would see as necessary cost of business.

The claim of 'community benefits' has been so exaggerated as to make the genuine discretionary spending look trivial. The genuine component was probably of the order of up to \$100 million. That is well below the MRRT which is expected to ramp up to \$2.2 billion in 2016-17.<sup>17</sup>

## Other issues

### Revenue

The revenue arguments have been curious to say the least. In railing against the tax its critics have referred to the vast damage it is supposed to have wrought. Yet the tax was expected to only raise only \$200 million in 2012-13 and another \$5.3 billion over the forward

<sup>13</sup> Hooke M (2013) 'Minerals industry's community spending exceeds \$34 billion' *Minerals Council of Australia, Press release*, 18 November.

<sup>14</sup> Banara (2013) *The value of community contributions in the Australian minerals industry; A report for the Minerals Council of Australia*, September.

<sup>15</sup> Banara (2013), p. 15.

<sup>16</sup> The latest input output tables show that Australian industry purchased \$2,470 billion as inputs into their production while total GDP was a much smaller \$1,292 billion. See ABS (2013) *Australian National Accounts: Input-Output Tables - 2009-10*, Cat no 5209.0.55.001, 20 September.

<sup>17</sup> 2013-14 Budget Paper No 1,

estimates. That compares with an annual \$90 billion in the mining industry's earnings before interest, tax, depreciation and amortization according to the ABS<sup>18</sup>. Given the value of profits involved in mining the MRRT is barely a nuisance for the mining companies.

### *Some design features*

An issue with the MRRT is its failure to collect much revenue in its early years. The 2013-14 budget papers report that only \$0.2 billion was expected to have been collected in 2012-13.

One of the reasons apparently is that the even old mines with costs that have long been fully written off were allowed to set a new and generous notional investment cost that would be deducted against revenue in the calculation of the MRRT. Miners had the choice of adopting not the book value but the market value of particular mines. Mine values were inevitably very high when based on capitalising the potential future cash flow projected at the peak of the commodity price boom. Moreover any 'loss' brought forward would be subject to the uplift factor (the bond rate plus seven per cent).

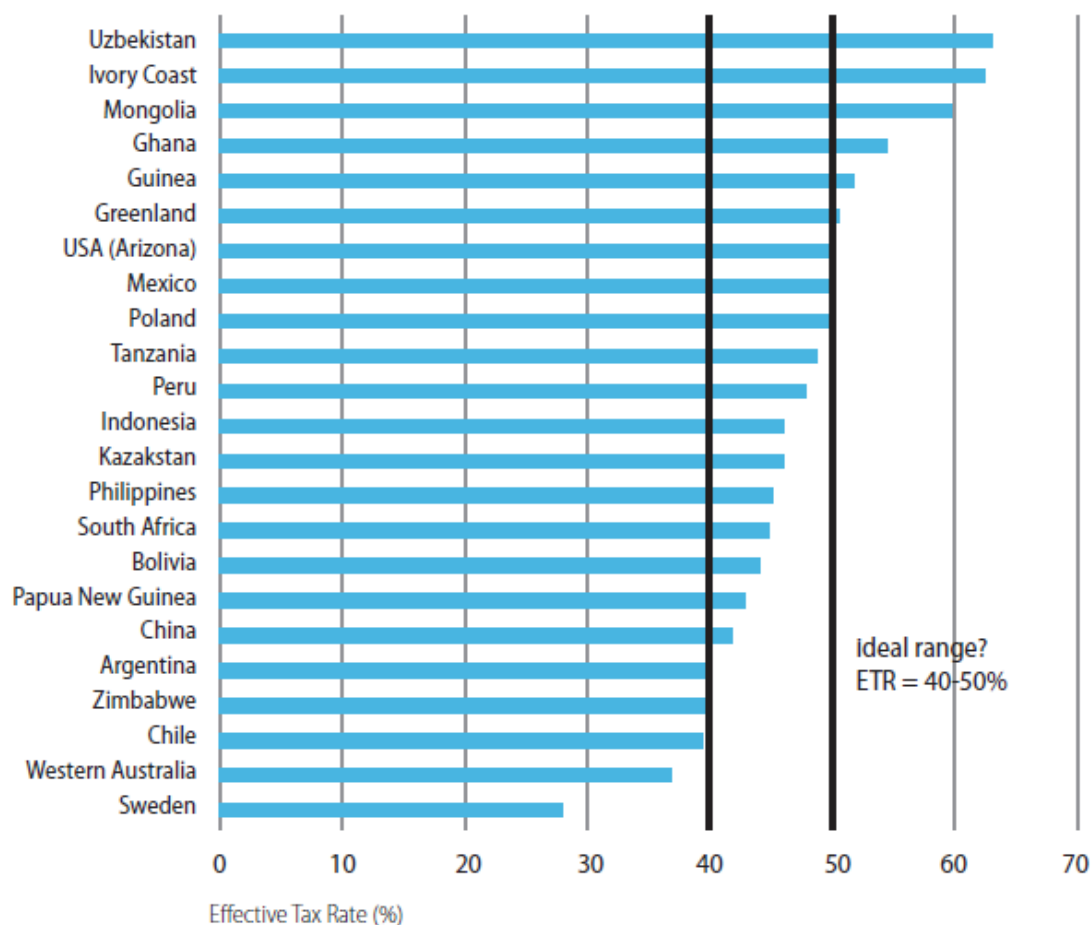
This should not be treated as a criticism of the mining tax itself but instead reflects the generous way the mining companies were allowed to influence their own tax liabilities.

### *International comparisons*

International comparisons are rarely published. The reason is most likely the difficulty of making comparisons between countries when there is a vast difference in the way mining is taxed. Indeed, some other measures are used that can have tax-like effects but act completely differently. For example, some countries operate production-sharing agreements or compulsory sharing of equity in mining projects. In addition, the attributes of the mine itself can influence the tax treatment. However, a recent study done for the OECD compares a hypothetical copper mine in various countries. The relevant graph showing the results is reproduced in the figure below.

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<sup>18</sup> ABS (2013) *Australian Industry, 2011-12*, Cat no 8155.0, 28 May

**Figure 1: Effective tax rates on a model copper mine in various countries**

Source: P Mitchell, 'Taxation and investment issues in mining', in The Extractive Industries Transparency Initiative, *Advancing the EITI in the mining sector: a consultation with stakeholders*, EITI, 2009.

These results are very interesting. They show that if the model copper mine happened to be in Western Australia, the effective tax rate would be around 37 per cent, the second to bottom on the list of countries included in the study. Moreover, the study finds the ideal range is 40 to 50 per cent, the range in which most countries fall.

Of course, not only is the effective tax rate important, so is the design of the tax system. As the Henry Report argues, resource rent taxes are better than royalties because the latter is a cost to miners whether or not the operation is profitable. Hence a royalty is more likely to deter investors than resource rent taxes, which are more of a profit-sharing arrangement, or indeed, a super-profit-sharing arrangement.

## Conclusion

The need for a tax on mining activities in Australia and it should be broadened to include all minerals. The miners can easily bear it and their super profits are due the Australian resources they exploit—not their own abilities. If, as suggested in the Henry Report, a rent tax on mining is compared with other income taxes, there would seem to be no contest. The Henry Report outlines a strong case for a resource rent tax.

If implemented, the Henry Report's proposal for an RSPT would have meant that super profits would be taxed at a maximum of 67.9 per cent from the perspective of individual investors. By comparison, in the last resources boom of the late 1970s early 1980s the tax



on all profits in all companies was taxed at 81 per cent for those at the top of the personal income tax scale.

The politics of the RSPT meant that the government watered it down with the MRRT, which operates in a similar manner to the PRRT but with a lower effective rate. From the perspective of individuals, that brings the maximum tax on super profits down to 58.5 per cent but super profits are more narrowly defined and exempted for most minerals.

There is a strong case for taxing mining super profits and it seems the miners have got off fairly lightly. At the very least, we might suggest that the MRRT should be increased to 40 per cent, the PRRT rate, and that it should apply universally.

The Henry Report proposed a theoretically pure resource rent tax. The political negotiations that followed resulted in some important compromises and perhaps too many concessions to the mining industry. The biggest anomaly is that the resource rent tax, in practice, has three rates: 40 per cent for oil and gas, 22.5 per cent for iron and coal and zero for all other minerals. It would seem there is an important unfinished agenda here.

If this measure succeeds and the MRRT is passed back to the miners their income will increase by that amount. Most of it will go overseas to foreign shareholders and we can be confident that very little else will happen to the benefit of ordinary Australians. The miners have not promised to employ more, train more, explore more, invest more or produce more. This will be a simple gift with nothing in return.

## Small Business Measures

The present package involves three measures;

- repeal of loss carry back;
- reduction in the small business instant asset write off threshold;
- repeal of accelerated depreciation for motor vehicles;

It is not the intention here to discuss these arrangements in any depth. However it should be noted that these measures assist small business and to repeal them in the interests of assisting big business in the mining sector seems curious. Most small business operates outside the mining industry and has been disadvantaged by the mining boom which has made much of the Australian economy uncompetitive.

The issue of accelerated depreciation for motor vehicles is also likely to affect motor vehicle manufacturing in Australia so that the government would repeal this particular measure while in Opposition it said it would reverse the decision to tighten up on the FBT for motor vehicles.



## Geothermal energy

The Abbott government plans to eliminate the geothermal energy exploration deduction only just introduced under the Labor government and which for geothermal energy levels the playing field with other mining.

Geothermal energy is relatively new in Australia and there is no commercial production as yet. However geothermal energy has massive potential with Geoscience Australia reporting that just one per cent of the shallow geothermal energy could supply all of Australia's energy needs for 26,000 years. Moreover, geothermal energy can be used to provide base load power since it does not fluctuate with the wind, sunlight or rainfall in the case of hydro power.

Expenditure on exploration or prospecting for the purpose of mining and quarrying is immediately deductible against assessable income in Australia. However, that did not extend to geothermal energy until amendments made in 2012 and which applied from July 2012. Now the Abbott government is set to repeal the immediate deductibility for geothermal exploration from July 2014. That will save \$5 million per annum after that compared with the \$400 million in tax concessions expected to be given to other mining companies in 2014-15.

To repeal this measure seems to contract the intention behind Direct Action. If this measure is repealed geothermal exploration will not have the same incentives as any ordinary explorer looking for fossil fuels will get. If anything the playing field should be tilted in favour of geothermal energy exploration.

We have argued earlier that new investment in renewables should receive assistance through the tax system to reflect their unique attributes. There are important arguments in favour of assistance.<sup>19</sup> Renewable projects tend to be relatively new technologies that are still evolving rapidly. In the case of geothermal energy of the type being developed in Australia the technology is truly at the cutting edge. The important point about new technologies is that improvements tend to be very rapid. Unfortunately that means that any investment is soon overtaken as later investments tend to be much more efficient. Hence there is a rapid technological obsolescence in this type of project. Our tax system does not recognise the fact of technological obsolescence. While the earlier arguments suggested accelerated depreciation for those investments the exact mechanism is not so important. Geothermal needs to be favoured relative to other investments and repealing the exploration provisions goes in the wrong direction. This decision should not go ahead or, if it does, it should be replaced with measures to boost the attraction of investment in geothermal.

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<sup>19</sup> Richardson D (2008) *Tax treatment of capital investments in renewable energy*, October

## **Re-phasing of the change in rate of the superannuation guarantee charge percentage**

This measure literally takes money out of the retirement accounts of millions of working Australians. On the latest figures 90 per cent of Australian employees have super paid on their behalf<sup>20</sup> and there are 9.17 million employees<sup>21</sup> so this measure will affect some 8.2 million people at any one time.

The super guarantee is presently 9.25 per cent. It was due to increase every year on 1 July by 0.25 per cent until it reaches 12 per cent which was due to occur on 1 July 2019. The present proposal is to defer the increase planned for 2014 and not increase it to 9.50 per cent until July 2016.

For someone on average weekly ordinary time earnings at age 30 and who retires at 65 the cost of the delay in the super increases could cost around \$6,500 in today's prices. It is the retirement income of the current workforce that is being hit here in order to contribute to increasing the income for the miners.

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<sup>20</sup> ABS (2013) *Employee earnings, benefits and trade union membership, Australia, August 2012*, Cat no 6310.0, 17 May.

<sup>21</sup> ABS (2013) *Forms of employment, Australia, November 2012*, Cat no 6359.0, 19 April.

## Low income superannuation contribution

The low income superannuation contribution is not a concession to low income earners but is a measure designed to offset the penalty of having income super taxed at 15 per cent when the taxpayer concerned has insufficient income to trigger any personal income tax liability.

The Low Income Super Contribution is calculated as 15 per cent of the super contribution to a maximum of \$500 so long as the income itself is less than \$37,000. The government pays that amount to the super fund as a co-contribution alongside other payments into super. The philosophy behind the measure is that high income earners receive a large tax concession for money they put through the super system but low income earners are often disadvantaged, especially those that would not have paid any tax if the money were received as part of their wage.<sup>22</sup> Hence in order to extend the tax advantage to low income earners the Labor government introduced the low income super contribution. The low income super bonus extends to most full-time workers in retail, restaurants, cafes, accommodation and similar industries.

At the time it was introduced the then minister, Bill Shorten, said 'the Low Income Superannuation Contribution benefits 3.6 million Australians on low and modest incomes, including 2.1 million women'.<sup>23</sup>

It has to be said that a maximum of \$500 does not sound like all that much but it can add substantially to the final super balance available at the time of retirement. For example, a low income earner who gets the full \$500 and expects to keep getting it, at age 25 now and who expects to retire at 65, would have an additional super of \$37,700 on retirement due to the low income super contribution. So if this contribution is repealed the eventual super payout would be \$37,700 less. (This assumes a very modest 3 per cent per annum rate of return in the super fund.)

It is worth noting that people hit by the repeal of the low income superannuation contribution are also going to be affected by the delay in the increase in the superannuation guarantee rates over coming years.

The cuts facing low income earners contrast dramatically with the last decisions of the Howard government and the dramatic tax cuts it delivered to the rich through both cuts in personal income tax and increases in tax concessions for superannuation that went mainly to the very high income earners.

If tackling superannuation arrangements to improve the budget balance is the issue then there are other matters that could be addressed. The then Minister for Financial Services and Superannuation used to host a superannuation roundtable to discuss issues and policies related to superannuation. That discussion included the circumstances whereby some individuals had self-managed super funds worth \$100 million or more. Clearly for many people superannuation is not just a retirement savings vehicle but a tax-avoidance vehicle. Running businesses or receiving other income through a super fund is attractive when the

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<sup>22</sup> Taxpayers who attract the low income tax offset pay no income tax until their income reaches just over \$20,500. However, before the low income super contribution they paid 15 per cent tax on their own super contributions. By contrast the many taxpayers in the 32.5 per cent marginal tax range get a 'discount' when they put money into superannuation where the contribution is taxed at 15 per cent. The 'discount' is even higher for those on the 37 and 45 per cent marginal tax rates.

<sup>23</sup> Shorten W (2013) 'Reforms to make the superannuation system fairer', Press Release no 20, 5 April.

tax rate on super is 15 compared with the top personal tax rate of 45 per cent plus a Medicare levy of 1.5 per cent.<sup>24</sup>

The latest estimates we have indicated that tax concession for super that go mainly to the rich will reach \$50.7 billion in 2016-17. Even that figure will be dwarfed in the future when super balances are expected to quadruple. In the meantime the head of Treasury, Martin Parkinson, has voiced concern about the fiscal sustainability of super tax concessions, especially when all other areas of the budget are under scrutiny.<sup>25</sup>

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<sup>24</sup> The Australia Institute has written extensively on this topic in the past. See for example Denniss R and Richardson D (2012) *Can the taxpayer afford 'self-funded retirement'?* The Australia Institute Policy Brief No 42, August.

<sup>25</sup> Parkinson M (2012) 'Future challenges: Australia's superannuation system', Speech to the ASFA 2012 conference – New directions, Sydney, 28 November.

## Income support bonus

The income support bonus is a twice yearly payment to people on some income support payments and is designed to assist with unexpected living costs. It is paid on 20 September and 20 March at \$105.80 for singles and \$88.20 each for couples. The payments are adjusted each year in line with the Consumer Price Index. The payments that attract the bonus are:

- ABSTUDY Living Allowance
- Austudy
- Exceptional Circumstances Payment
- Newstart Allowance
- Parenting Payment
- Sickness Allowance
- Special Benefit
- Transitional Farm Family Payment
- Youth Allowance

The people on these payments include some of the poorest in Australia. All in all there are some 1.5 million people at any time who rely on these payments and all will be affected.

## **Schoolkids Bonus**

The Schoolkids Bonus is paid to eligible families each January and July. To be eligible for the Schoolkids Bonus the child must be in primary or secondary school and in receipt of the Family Tax Benefit Part A or government income support.

The Schoolkids Bonus is paid twice a year in January and July with each payment at \$205 twice a year for a primary school child and \$410 twice a year for a secondary school child.

The Schoolkids Bonus can be quite helpful for a large family even on a relatively high income. A family with one primary school child and two high school children would receive \$2,050 per annum. If that family relies on one income earner on average weekly wages, currently \$1,420.90 a week, the household's after-tax income is boosted by 3.5 per cent per annum which they receive at strategic times during the year. That is a significant item even for families quite a way up the income scale.





# *SKATT:*

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## TREASURE AND TAX IN AUSTRALIA AND THE NORDIC COUNTRIES

EXPLORING POLICY SETTINGS  
IN NORDIC COUNTRIES AND THEIR POTENTIAL  
APPLICATION IN AUSTRALIA

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THE FIRST REPORT IN A PARTNERSHIP BETWEEN  
THE AUSTRALIA INSTITUTE AND DEAKIN UNIVERSITY

PROFESSOR ANDREW SCOTT

REPORT | MARCH 2019

# ***Skatt:***

## **Treasure and tax in Australia and the Nordic countries**

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***The first report of a partnership between The Australia Institute and Deakin University exploring policy settings in Nordic countries and their potential application in Australia***

**Professor Andrew Scott**

**March 2019**



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The Australia Institute is an independent public policy think tank based in Canberra. It is funded by donations from philanthropic trusts and individuals and commissioned research. We barrack for ideas, not political parties or candidates. Since its launch in 1994, the Institute has carried out highly influential research on a broad range of economic, social and environmental issues.

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The Australia Institute established the Nordic Policy Centre to explore the policy lessons that Australia can learn from the Nordic nations. Through research, stakeholder engagement, policy development, events, and public education, the Centre hopes to widen the Australian policy debate to include Nordic solutions to the big economic, social and environmental questions facing Australia.

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Email: [mail@tai.org.au](mailto:mail@tai.org.au)  
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# Preface

Tax is the price we pay to live in a civilised society. This is perhaps reflected in the Swedish term for tax, 'skatt', being synonymous with 'treasure'. In Australia, by contrast, tax is not seen in such a positive light and the term 'tax reform' is too often used to simply mean tax cuts.

The Australia Institute has attempted to push Australia's tax debate beyond questions of higher or lower and to instead ask what kind of country do we want to live in and what policies are needed to get there?

There are numerous countries Australia could look to for policy inspiration, but the Nordic countries' consistent high performance across a range of social and economic indicators makes them an obvious choice. The Australia Institute's Nordic Policy Centre will explore what lessons Australia can learn from the Nordic nations.

Professor Andrew Scott of Deakin University has written extensively on Nordic policy, especially in his 2014 book *Northern Lights: The Positive Policy Example of Sweden, Finland, Denmark and Norway*. We are delighted to work with Professor Scott on this first report of the Nordic Policy Centre. While this report focuses on tax, we hope to link his and other researchers' expertise on Nordic policy to a range of policy debates in Australia.

Ben Oquist

Executive Director  
The Australia Institute

# Introduction

The four main Nordic nations – Sweden, Finland, Denmark and Norway – are among the world's most highly ranked countries in terms of the factors that determine prosperity and particularly in terms of innovation: consistently ranking well above Australia.<sup>1</sup> They are also among the most equal in terms of income distribution – much more equal than Australia.<sup>2</sup> These countries therefore provide an opportunity to study how policy settings might be adjusted in Australia to bring about a more prosperous, innovative and equal society here.

The Nordic countries are tangible examples of how economies flourish best in less economically divided societies. Nobel Prize-winning economist Joseph Stiglitz has shown that, “over the period 2000 to 2010, high-taxing Sweden...grew far faster than the United States. The country’s average growth rates...exceeded those of the United States...2.31% a year versus 1.85%”.<sup>3</sup> When those calculations are updated to look at the trend from 2010 to 2016, Sweden’s superior average annual economic growth rate continued – 2.86% compared to America’s 2.14%.<sup>4</sup>

Tax is a part of the Nordic countries’ economic success and a point of difference with Australia. The Swedish word for tax – *skatt* – has another meaning: ‘treasure’. This makes the Swedish language unusual in having such positive connotations associated with the word for community members’ payment of contributions for the general good.<sup>5</sup> Values such as security, fairness, trust and a sense of belonging underpin – and are in turn reinforced by – the taxation arrangements in all four main Nordic nations. While changing the Australian word for tax is unlikely, improving the fairness and transparency of the tax system could begin to strengthen similar values here.

Australia is a low tax country, with tax and other revenue representing 35.3% of GDP in 2018. This is below the OECD average and sits in the bottom 6 of 33 OECD nations,

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<sup>1</sup> World Economic Forum, *The Global Competitiveness Report 2016–2017*, World Economic Forum, Geneva, 2016, pp. xiii, 4, 102.

<sup>2</sup> See Organisation for Economic Co-operation and Development (OECD), *In It Together: Why Less Inequality Benefits All*, OECD, Paris, 2015, Figure 1.1 (p. 20).

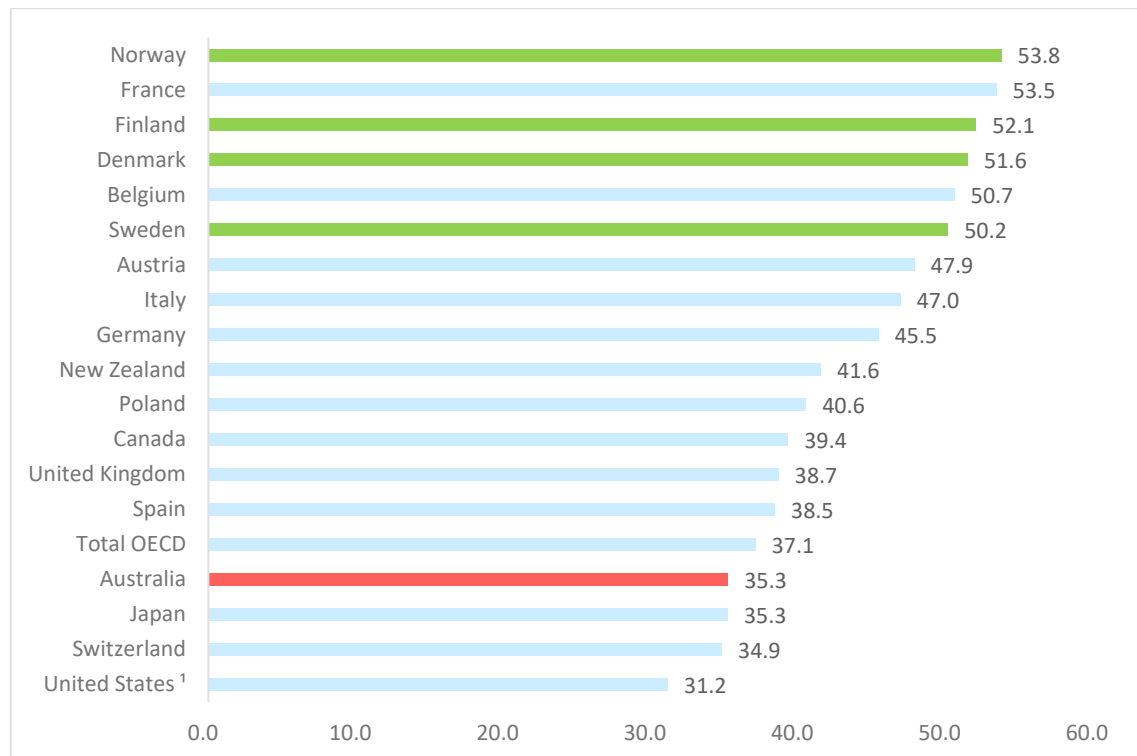
<sup>3</sup> Joseph E. Stiglitz, *The Price of Inequality*, Penguin, London, 2013, p. 28. These calculations were based on World Bank Indicators.

<sup>4</sup> These calculations, like those of Stiglitz, are made from World Bank Indicators, available at <http://data.worldbank.org/indicator>

<sup>5</sup> David Wiles, ‘Why Swedes are Okay with Paying Taxes’, 2 May 2017, at: <https://sweden.se/society/why-swedes-are-okay-with-paying-taxes/>

whereas the main Nordic nations fill 4 of the top 6 positions: Sweden at 50.2%, Denmark 51.6%, Finland at 52.1% and Norway at 53.8% as the following chart shows.

**Figure 1: Tax to GDP ratios, selected OECD**



Source: OECD Statistics 2018 data in OECD *Economic Outlook* Annex Table 30,  
<https://stats.oecd.org/>

The experience of the four main Nordic nations shows that tax revenue is integral to provision of services such as high standard education, health, public transport, quality infrastructure and other services that deliver considerable benefits to the people who live in those countries – and which help to reduce inequalities.

For example, the Nordic nations provide free university education as one of the outcomes of their high tax revenues. Australia had free university education between 1974 and 1988. However, since then it has become one of the most expensive nations in the OECD in terms of the costs of post-school study paid by individual students.<sup>6</sup>

One of the ways in which Nordic countries generate large taxation revenue is by investing in policies that ensure high workforce participation rates. On average, the four main Nordic nations' workforce participation rates are 1.5 percentage points higher than Australia.<sup>7</sup> Policies such as a focus on quality skills training opportunities

<sup>6</sup> OECD, *Education at a Glance 2017*, OECD, Paris, 2017, pp. 212-223.

<sup>7</sup> 2017 data at: <http://www.oecd.org/els/emp/employment-outlook-statistical-annex.htm> (Table C).

contribute to high rates of workforce participation, feeding back into higher income tax revenue.

Nordic nations' revenue is also spent on other policies with strong public support – such as to achieve reasonable work/life balance, for example the generous paid parental leave arrangements on which Australians who have moved to Sweden have favourably commented.<sup>8</sup> The positive effects of the benefits, services and programs which are received by people who live in the Nordic nations, from the large revenue which their governments raise, leads to those people's continued overall support for payment of the taxes required.

Recent data indicates that a large majority of Australians (64%) want more public spending on services and infrastructure, funded by greater tax revenue, in particular from wealthy people and from profitable companies, in order to achieve less inequality in Australian society.<sup>9</sup> If Australians are to receive more services and benefits than they currently do, then the necessary revenue will need to be raised.

The strength and consistency of this and similar findings – such as the late April 2018 Newspoll which found that only 15% of Australian voters thought cutting income tax rates was a top priority for the budget – have led one seasoned political commentator to write that:

A significant question is how much potency “tax” has in an election these days... it does seem likely that tax cuts are not...the vote-magnet they once might have been...[given that] many voters today are often more concerned about services.<sup>10</sup>

Universalism in welfare provision in the Nordic nations means that all sections of society have a stake in the provision of services and that most are therefore prepared to pay the taxes necessary to support those services. By contrast, when benefits are limited only to the most vulnerable people, then the rest of the population feel that they are paying for something from which they do not receive anything in return, so they become less likely to support paying taxes.

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<sup>8</sup> Richard Orange, 'Paid Parental Leave: How Swedish Mums and Dads Do It', *The Sydney Morning Herald*, 20 March 2014, at: <https://www.smh.com.au/national/paid-parental-leave-how-swedish-mums-and-dads-do-it-20140319-352gj.html>

<sup>9</sup> The Australia Institute, 'Polling – More or Less Spending, Tax, Inequality?', April 2018, at: <http://www.tai.org.au/sites/default/files/Polling%20Brief%20-%20April%202018%20-%20more%20or%20less%20spending%20tax%20inequality.pdf>

<sup>10</sup> Michelle Grattan, 'Can the Turnbull Government Make the Election All About Tax?', *The Conversation*, 26 April 2018.

In contrast, the selective and minimal welfare arrangements that apply in low-tax countries, like Australia and America, contribute to spiralling hostility towards many welfare recipients. This is not simply race-based. Nordic nations are no longer ethnically homogeneous societies, contrary to past perceptions. There has been a rise in immigration to the Nordic nations over several decades. People who were born outside Sweden now make up more than 18 per cent of Sweden's population for instance.<sup>11</sup> As in other economically developed nations since the late 1990s, there has been some electoral backlash in Nordic countries to rising immigration; however, increased multiculturalism has not undermined substantial welfare provision there.<sup>12</sup> The similarities between the societies of Australia and the Nordic countries and the differences in tax systems provide opportunities for research and will be a focus of further research in this series.

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<sup>11</sup> Computed from:

[http://www.statistikdatabasen.scb.se/pxweb/en/ssd/START\\_\\_BE\\_\\_BE0101\\_\\_BE0101E/InrUtrFoddaRegALKon/table/tableViewLayout1/?rxid=65a4a433-5f3e-49ae-9a25-378efa94842a](http://www.statistikdatabasen.scb.se/pxweb/en/ssd/START__BE__BE0101__BE0101E/InrUtrFoddaRegALKon/table/tableViewLayout1/?rxid=65a4a433-5f3e-49ae-9a25-378efa94842a)

<sup>12</sup> See Stephen Castles and Carl-Ulrik Schierup, 'Migration and Ethnic Minorities' in Francis G. Castles, Stephan Leibfried, Jane Lewis, Herbert Obinger and Christopher Pierson (eds.), *The Oxford Handbook of the Welfare State*, Oxford University Press, Oxford, paperback edition 2012, pp. 278–291.

# Tax and treasure in the Nordic countries

Nordic nations raise large amounts of revenue by having broad tax bases. Some of the main differences between the structure of taxes in Australia and in the Nordic nations are that income taxes are much higher in Denmark than Australia; and that Goods and Services Taxes are significantly higher in all four main Nordic nations than Australia.<sup>13</sup>

The four main Nordic nations were also among the first in the world to introduce carbon taxes (they did so from the early 1990s). Australia by contrast repealed its carbon tax after just two years in 2014.

## HEADLINE COMPANY TAX RATES

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In terms of headline company tax, i.e. the tax on company *profits*, the four main Nordic nations actually had lower rates than Australia in 2018: with Finland at 20%, Sweden and Denmark at 22% and Norway at 23% compared to Australia at 30%.<sup>14</sup>

The rate for businesses whose turnover is less than \$50 million a year has begun to reduce towards 25% by the years 2026-2027, as a result of decisions taken by the Australian Parliament in April 2017. However, the Turnbull Government's policy to similarly cut company tax rates for larger businesses failed to gain parliamentary support and has been abandoned.

While the immediacy of Australia's company tax debate has passed, important points remain in terms of the differences between the Nordic nations and us.

## NO DIVIDEND IMPUTATION IN NORDIC COUNTRIES

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Firstly, as was pointed out in debate about the Turnbull Government's attempts to cut company tax rates, Australia's 'dividend imputation' credits since 1987 mean that any comparison of the 30% statutory company tax rate here with the rates overseas is not comparing like with like.

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<sup>13</sup> See OECD, *Revenue Statistics 1965-2016*, OECD, Paris, 2017, pp. 74, 134, 90, 86, 122.

<sup>14</sup> 'Statutory Corporate income tax rates', OECD.Stat, Tax Database, Table II.1 at: [http://stats.oecd.org/index.aspx?DataSetCode=TABLE\\_II1](http://stats.oecd.org/index.aspx?DataSetCode=TABLE_II1)

Much Australian company tax paid then goes back to company *shareholders* in the form of rebates, through the distribution of franked dividends. Franking credits are then used by Australian shareholders to offset their income tax. The more tax paid by the company, the less is paid by shareholders. Since the year 2000, shareholders with spare tax credits have been allowed to swap those for cash.

Such dividend imputation tax systems are unusual internationally. Australia and New Zealand are the only two OECD countries to have such systems, with Norway, Finland, Germany and the UK having abandoned dividend imputation arrangements in the last two decades.<sup>15</sup>

No other country includes cash refunds for franked dividends, a policy the Labor opposition proposes to change, with exemptions for pensioners, charities and not-for-profit organisations. Such arrangements are not found in Nordic or other countries, perhaps because they overwhelmingly benefit the well-off.

## NORDIC SOCIAL SECURITY CONTRIBUTIONS

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The second, and even more important point, which now needs to be brought fully into this debate, is that in the Nordic nations social security programs are heavily financed by contributions from employers. In Norway, for instance, social security payments are supported by payroll taxes of up to 14.1% of gross salary.<sup>16</sup>

Australia is one of the very few OECD countries in which corporations are not required to pay any Social Security Contributions. Overall, companies in the Nordic nations pay considerably more tax, and make other contributions for societal benefit, than do companies in Australia.

In Norway, the Social Security Contribution component of taxation paid by employers itself amounts to more than 6% of GDP, in Sweden it is 7% of GDP and in Finland it is nearly 9% of GDP – compared to the zero figure in Australia.<sup>17</sup> This enables the Nordic

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<sup>15</sup> Australian Government, *Australia's Future Tax System: Report to the Treasurer December 2009, Part Two, Detailed Analysis, Volume 1 of 2*, Commonwealth of Australia, Canberra, 2010, p. 191.

<sup>16</sup> This and other detailed data below were collated and provided to the author by the Oslo Economics consulting firm. All references to \$ (dollars) in this report are to Australian dollars. Currency conversions have been calculated according to the nearest actual exchange rates as published by the Australian Tax Office at: <https://www.ato.gov.au/Tax-professionals/TP/Financial-year-ending-30-June-2018/>

<sup>17</sup> 2015 data in: OECD, *Revenue Statistics 1965-2016*, pp. 122, 134, 90, 74. Denmark requires less Social Security Contributions by employers to government than the other Nordic countries according to OECD measurements but has extensive other arrangements such as for unemployment insurance.



nations to manage their economies in a better, fairer and more egalitarian fashion than does Australia.

If Australian companies paid Social Security Contributions on this scale then they would be paying at least \$100 billion a year more than now.<sup>18</sup> This would mean well more than double the \$89.1 billion company tax they are estimated to pay this financial year.<sup>19</sup> Claims that Australian companies are paying among the world's highest levels of taxes overall are therefore false and misleading.

## WHERE THE MONEY PAID BY COMPANIES IN NORDIC NATIONS GOES

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Employers in Nordic nations contribute directly towards much more **extensive paid parental leave** (which can be for as long as sixteen months in Sweden), **skills training** opportunities, **income support for the unemployed** and also for people experiencing **health** problems, than employers are required to do in Australia.

This is part of a policy framework of 'Social Protection' pursued in all the Nordic nations. 'Social Protection' means the coverage of precisely defined risks and needs associated with: ill health, disability, old age, parental responsibilities, loss of a spouse or parent, unemployment, insufficient housing or community amenities, and social exclusion.

The usual English language sources, including OECD publications, do not give detailed information about the benefits, programs and services that people receive in Nordic nations as a direct result of the payment by corporations of Social Security Contributions. The following examples of these benefits, programs and services are now provided here from especially commissioned, multi-lingual Nordic-based economists, so as to help better inform the Australian debate.

The first example is how employers in Sweden contribute: *Ålderspensionsavgiften*, an old age **pension** fee of 10.21% of gross salary; *Efterlevandepensionsavgift*, a loss of spouse or parent insurance fee of 0.7% of gross salary; *Sjukförsäkringsavgift*, a sick leave insurance fee of 4.35% of gross salary; and *Arbetsmarkadsavgift*, an

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<sup>18</sup> Computed from Australian Bureau of Statistics (ABS), *Australian System of National Accounts, 2016-17*, Catalogue no. 5204.0, ABS, Canberra, 27 October, 2017.

<sup>19</sup> Australian Government, *Budget Strategy and Outlook Budget Paper No. 1 2018-19*, Commonwealth of Australia, Canberra, 8 May 2018, Table 7, p. 5-17.

unemployment insurance fee of 2.64% of gross salary. Finland has very similar arrangements.

In Denmark, all employers contribute towards a labour market supplementary pension fund. The average annual fee is around \$690 for each full-time employee, of which two thirds is paid by the employer. Also in Denmark, employers pay a combined annual \$110 for each of their employees towards: unemployment benefits and programs; sick leave; parental leave; and into an insurance fund which protects employees against bankruptcy.

Qualitatively, and very importantly, this means that business is partly responsible for whole of life incomes in the Nordic nations. Employers in turn receive many benefits from making the contributions they do there. Companies gain demonstrated returns from their contribution to spending on active labour market programs, for instance, in the form of better matched job seekers when, and where, they need those job seekers to fill vacancies.<sup>20</sup>

Work by econometrician and Emeritus Professor P. N. (Raja) Junankar is pertinent to point out in this respect. Junankar finds from his research that “the costs of unemployment, even if we take a low estimate, are very significant...society is losing about 5% of GDP”. That is before we even “place a monetary value on social costs of unemployment (e.g. crime, disruption of social fabric etc.)” i.e. even if we just “concentrate... on the first-round or impact costs and neglect...the dynamic adjustments...[and] the multiplier effects”. As he emphasises, “unemployment...imposes significant costs on everybody in the society”.<sup>21</sup>

Employers therefore have an interest in reducing the unemployment that prevents nations from reaching their full economic potential. The looming prospect of an unsustainably high ‘dependency ratio’ in Australia, which would disadvantage employers, could also be prevented, or at least alleviated, by employers contributing to active labour market skills programs which maintain mature-age workers consistently in paid employment until their retirement, as employers do in the Nordic nations.

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<sup>20</sup> Erik Bjørsted, Elva Bova and Signe Dahl, ‘Lessons Learnt from the Nordics: How to Fight Long-Term Unemployment’, *Intereconomics*, Vol. 51, No. 3, May 2016, pp. 172-178.

<sup>21</sup> P. N. (Raja) Junankar, *Economics of the Labour Market: Unemployment, Long-Term Unemployment and the Costs of Unemployment*, Palgrave Macmillan, Basingstoke, 2016, pp. 455, 454.

# The social purpose of business

The high trust which underpins payment of high taxes in the Nordic countries derives in part from a greater confidence there than in Australia in the “ethical behaviour of firms”. Sweden is ranked number 1 in the world on this indicator, Finland number 4, Denmark number 5, Norway number 8 – whereas Australia is number 13.<sup>22</sup>

Improving the ethical behaviour of banks and other businesses in Australia to those higher standards, and greater action by Australian companies for social purposes rather than in their own vested interests, is now essential for a more responsible debate on taxation to unfold.

In 2018, long-time public servant, and reviewer of the Australian tax system, Dr Ken Henry, warned that “our present tax system is not sufficiently robust to finance government spending...through the economic cycle” and that “Australia will get no progress on tax reform unless the community sees vested interest make way for the national interest”. He added that “It is time we got really serious about the social purpose of business...If we in business are going to be taken seriously in these debates, we will have to demonstrate that we are engaging not out of self-interest, but because we share a mission to improve the wellbeing of the Australian people”.<sup>23</sup> Dr Henry had by then entered the private sector and made those comments in his capacity as the chair of the National Australia Bank. While he has since stepped down from that role following the Banking and Financial Services Royal Commission, the need he identified – for Australia to get serious in Australia about the social purpose of business – is greater than ever.

The Henry Review’s recommendation for “reducing the company income tax rate to 25% over the short to medium term” was made on the basis that “improved arrangements for charging for the use of...[Australia’s non-renewable] resources should be introduced *at the same time*. A broad-based resource rent tax would be a more effective way to ensure an appropriate return to Australians for the exploitation

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<sup>22</sup> World Economic Forum, *The Global Competitiveness Report 2016–2017*, pp. 331, 177, 163, 285, 103.

<sup>23</sup> Dr Ken Henry AC, Speech to the Australian Institute of Company Directors Governance Summit, 2 March 2018 at: <https://news.nab.com.au/nab-chairman-dr-ken-henry-ac-speech-to-the-aicd-governance-summit/>

of their natural resources” than current arrangements, the Review recommended.<sup>24</sup> In fact, the Henry Review made specific reference to Norway’s system:

For Norway, a stable resource charging system appears to have played an important role in supporting petroleum exploration and development activity... Activity remained strong despite a decline in the prospect of new discoveries in Norway’s continental shelf...

Norway’s petroleum tax system approximates a rent-based tax. Though based on the company income tax system, it applies an uplift to expenditure to exempt the normal return from tax and reimburses the tax value of exploration expenditure for companies in a loss position. Norway imposes a total tax rate on petroleum rents of 78 per cent, consisting of a 50 per cent rent-based tax rate and company income tax of 28 per cent, with no deduction at the company income tax level for tax paid under the rent-based tax.<sup>25</sup>

The Henry Review’s proposal to cut the company tax came alongside other measures that were considered essential to *complement*, or offset, any loss of company tax revenue. Australian trust in business is not likely to be improved by the business community advocating again for the tax cut, in isolation from these offsetting recommendations.

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<sup>24</sup> Australian Government, *Australia’s Future Tax System: Report to the Treasurer December 2009, Overview*, Commonwealth of Australia, Canberra, 2010, pp. 40, 86. Emphasis added.

<sup>25</sup> Australian Government, *Australia’s Future Tax System: Report to the Treasurer December 2009, Part Two, Detailed Analysis, Volume 1 of 2*, p. 224

# The need to revisit resource taxation in Australia

I have written previously about how Norway's economy, like Australia's, relies heavily on the extraction of natural resources but how, unlike Australia, Norway has acted consistently to manage its natural resource endowments for the nation's long-term benefit. Norway does this through adequate taxation and a highly successful sovereign wealth fund that shows Australia what is now possible.<sup>26</sup>

Through these means Norwegians have avoided the 'curse' that often afflicts nations managing plentiful natural resources, namely damage to other tradeable sectors through appreciation of the home currency. By contrast, as Australian mining grew the Australian dollar increased significantly in value, which put major pressure on Australian exporters of non-mining products.<sup>27</sup>

Journalist and author Paul Cleary argued in 2016 that one of the

key lessons for Australia from the story of Norwegian oil...[is that] the [Australian] government should revisit the super-profits tax [which was attempted in 2010], so that the nation benefits the next time mineral prices surge. In order to head off the political opportunists, the government must properly explain the need for this tax, and...package it with reform of imposts such as stamp duty and royalties that are legacies of our colonial past.<sup>28</sup>

Norway's sovereign wealth fund is fully owned by the Norwegian state through the Ministry of Finance. It is managed by Norway's central bank (Norges Bank). It has grown to be worth nearly 8.5 billion Norwegian kroner at the end of 2017.<sup>29</sup> This took it above the level of one trillion Australian dollars.

Cleary's book *Trillion Dollar Baby* gives full documentation and analysis for Australians of Norway's achievements in building up its sovereign wealth fund for national benefit,

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<sup>26</sup> See: Andrew Scott, *Northern Lights: The Positive Policy Example of Sweden, Finland, Denmark and Norway*, Monash University Publishing, Melbourne, 2014, pp. 162-163, 165, 168-175, 181.

<sup>27</sup> David Richardson and Richard Denniss, 'Mining the Truth: The Rhetoric and Reality of the Commodities Boom', The Australia Institute Paper No. 7, September 2011, p. 27.

<sup>28</sup> Paul Cleary, *Trillion Dollar Baby: How Norway Beat the Oil Giants and Won a Lasting Fortune*, Black Inc., Melbourne, 2016, p. 189.

<sup>29</sup> See <https://www.regjeringen.no/en/topics/the-economy/the-government-pension-fund/market-value-of-the-government-pension-fund/id699635/>

and presents a cogent case for what Australian can learn by revisiting resources taxation to tackle its own revenue deficiency. Cleary points out that, unlike Australia and “many other countries, where oil companies have been able to win support by dividing and conquering the political class”, and where “companies are seen as benefactors who are doing the country a favour by developing resources, often with substantial tax concessions”, in Norway the national interest has been pursued. That nation’s resultant “revenue haul shows the benefit of putting in place sound policies in the event of a commodity boom”.<sup>30</sup>

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<sup>30</sup> Cleary, *Trillion Dollar Baby*, pp. XIII, 179-180, 134.

# Conclusion

There is a simple, but nonetheless true, maxim that you get what you pay for. Australian policy-makers now need to honestly face up to the arithmetic fact whereby, as Richard Denniss writes: “if Australia wants to remain one of the lowest-taxing countries in the developed world, then obviously it can’t invest in the highest quality services in the world...If we want to have a tax system like Singapore’s or Hong Kong’s, there is no way we can have a health or education system like Sweden’s”.<sup>31</sup>

People who live in the Nordic nations receive valuable returns from the higher taxes they pay, which is why they continue to pay them. Those returns come in the form of practical benefits, programs and services that improve those people’s everyday lives.

Employers in those countries gain too in terms of a healthier, well-educated and motivated workforce in which workers enjoy reasonable work/life balance. Part of that balance is achieved through extensive paid parental leave. Parents can return to the workforce without losing career positions after having the necessary time off at that crucial times in their family lives. Businesses thereby regain, rather than lose, skilled, experienced and valuable employees who return to work well motivated because they have been given that consideration. Australia has much more minimal and insecure paid parental leave arrangements that need to be improved.

Companies in Australia – including those which profit so extensively from the extraction of the nation’s natural resources – need to be less short-term and self-interested, in order to build a revenue base which can underpin a healthier, more skilled, and motivated workforce which has good work/life balance here.

Sweden, Denmark, Norway and Finland demonstrate the benefits that are possible when companies contribute properly to improve the wellbeing of the nation of which they are part. The different approaches that those countries take now need to be considered in more detail as part of a more mature tax debate in Australia.

Such a debate is now essential in order to: reduce inequality, invest properly in early childhood education and care, create more resources for science, research and development, build higher standard hospitals, improve public transport, schools, universities, and apprenticeship opportunities, boost modern physical and social infrastructure for our growing population, and, in general, to build a stronger society.

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<sup>31</sup> Richard Denniss, *Dead Right: How Neoliberalism Ate Itself and What Comes Next*, Quarterly Essay No. 70, Black Inc., Melbourne, 2018, pp. 71-72.





## Gorgon-tuan Problem

*Chevron's Gorgon LNG project released millions of tonnes CO2 last year that were meant to be sequestered by its carbon capture and storage (CCS) project. This failure represents half of the national increase in emissions over the last year. If required to offset these emissions, Gorgon would need to pay more than \$55m million a year. However, Gorgon will face no penalties and is in line to receive \$60m in taxpayer subsidy. Under the safeguard mechanism, it has an emission limit that assumes CCS is not operating.*

**Tom Swann**  
**November 2018**

Australia's greenhouse gas emissions have increased for three years in a row. The Department of Energy and Environment's *National Greenhouse Gas Inventory Quarterly Update* for March 2018 says:

Emissions for the year to March 2018 increased 1.3 per cent or 6.8 Mt CO<sub>2</sub>-e. This increase was mainly driven by LNG production for export.<sup>1</sup>

LNG emissions come from stationary energy (gas used in LNG processing) and fugitives (release of CO<sub>2</sub> and methane). LNG also increases emissions from electricity, which is used in the extraction and transport of gas.

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<sup>1</sup> Department of Energy and Environment (2018) *Environment's National Greenhouse Gas Inventory Quarterly Update - March 2018*, <https://www.environment.gov.au/system/files/resources/63391569-7ffa-4395-b245-e53893158566/files/nggi-quarterly-update-mar-2018.pdf>

The single largest source of LNG emissions is the Gorgon LNG Project off the North West of Western Australia. The main stake in the project is held by Chevron.

The gas in the Gorgon reservoir is relatively high in CO<sub>2</sub>. The Gorgon Project intends to sequester this CO<sub>2</sub> with carbon capture and storage (CCS). The Gorgon LNG Project is often lauded as the CCS flagship project. For example, on ABC RN the CEO of the Minerals Council Tania Constable pointed to Gorgon as the largest CCS project in the world, when it starts in 2019.<sup>2</sup> Ms Constable did not explain that the Gorgon Project's CCS has failed for the past two years emitting millions of tonnes of CO<sub>2</sub> that it promised to sequester.

Fugitive emissions from Gorgon are included in the National Greenhouse Gas Inventory.<sup>3</sup> They therefore make it harder to reach our emissions targets. The Government's emissions projections for future years include Gorgon CCS coming on "as currently scheduled" – presumably meaning as rescheduled for 2019, after two years of failure.<sup>4</sup> These projections will need to be adjusted further if there are further failures.

The Gorgon CCS project has CCS capacity of 3.4 to 4Mt per year.<sup>5</sup> Chevron previously estimated the Gorgon CCS project was to sequester between 5.5 and 7.8Mt of CO<sub>2</sub> over the first two years of operation.<sup>6</sup> It is likely the emissions from the second year of operation would be larger than the first, as production ramps up. There have also been some issues with production, but it is unclear whether and by how much this has reduced fugitive emissions.<sup>7</sup>

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<sup>2</sup> ABC RN (2018) *RN Breakfast, Tania Constable, CEO of the MCA*,  
[https://abcmedia.akamaized.net/rn/podcast/2018/10/bst\\_20181012\\_0816.mp3](https://abcmedia.akamaized.net/rn/podcast/2018/10/bst_20181012_0816.mp3)

<sup>3</sup> Senate Environment and Communications Committee (2018) *Question on Notice 162*,  
<https://www.aph.gov.au/api/qon/downloadestimatesquestions/EstimatesQuestion-Committeeld8-EstimatesRoundld3-Portfoliold10-QuestionNumber162>

<sup>4</sup> Senate Environment and Communications Committee (2018) *Question on Notice 164*,  
<https://www.aph.gov.au/api/qon/downloadestimatesquestions/EstimatesQuestion-Committeeld8-EstimatesRoundld3-Portfoliold10-QuestionNumber164>

<sup>5</sup> Global CCS Institute (2018) *Gorgon Carbon Dioxide Injection*,  
<https://www.globalccsinstitute.com/projects/gorgon-carbon-dioxide-injection-project>

<sup>6</sup> Milne (2017) *Carbon hiccup for Chevron with 5 million-tonne greenhouse gas problem at Gorgon LNG plant*, <https://thewest.com.au/business/oil-gas/carbon-hiccup-for-chevron-with-5-million-tonne-greenhouse-gas-problem-at-gorgon-lng-plant-ng-b88694565z>

<sup>7</sup> Milne (2017) *Carbon hiccup for Chevron with 5 million-tonne greenhouse gas problem at Gorgon LNG plant*,

In short, in a year when Australia's total emissions increased by 6.8Mt CO<sub>2</sub>, Chevron's failing Gorgon CCS project emitted up to 4Mt CO<sub>2</sub>. Gorgon's CCS failure so far represents a significant part, likely half or more, of Australia's emissions increase.

Chevron's fact sheet on the project not only ignores its failures to date, but further notes:

The Australian Government has committed \$60 million to the Gorgon Carbon Dioxide Injection Project as part of the Low Emissions Technology Demonstration Fund (LETDF).<sup>8</sup>

## Penalties for emitting millions of tonnes of CO<sub>2</sub>?

There is no federal requirement for Gorgon to sequester these emissions; it is not part of the federal approval.<sup>9</sup> As discussed below, Gorgon's emissions are subject to the safeguard mechanism, but Chevron has set itself an emissions limit that does not assume CCS operates successfully.

The WA Government approval for Gorgon requires it to sequester at least 80% of its fugitive emissions over a five year period. It is unclear how this is now possible and purchasing offsets to meet this target would cost tens of millions of dollars.

The WA Government has decided not to impose penalties, citing uncertainty about the meaning of "commencement of operations".

Failing to follow through on compliance through requiring offsets not only increases emissions sets a precedent that undermines the force of such obligations in the future.<sup>10</sup>

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<sup>8</sup> Chevron (2018) *Gorgon carbon dioxide injection project*, <https://australia.chevron.com/-/media/australia/publications/documents/gorgon-co2-injection-project.pdf>

<sup>9</sup> Senate Environment and Communications Committee (2018) *Question on Notice 163*, <https://www.aph.gov.au/api/qon/downloadestimatesquestions/EstimatesQuestion-Committeeld8-EstimatesRoundld3-Portfoliold10-QuestionNumber163>

<sup>10</sup> Diss (2018) *How the Gorgon gas plant could wipe out a year's worth of Australia's solar emissions savings*, <https://www.abc.net.au/news/2018-06-21/gorgon-gas-plant-wiping-out-a-year-of-solar-emission-savings/9890386>

On 17 October 2018, the WA Government gave Chevron “the benefit of the doubt”, saying they would revisit the question of offsets if the CCS was not working in “six months or a year’s time”.<sup>11</sup>

The Federal Government indemnified the Western Australian Government over long term risks from CO<sub>2</sub> leaks from Gorgon. This appears in every federal budget as a ‘contingent liability’.<sup>12</sup>

## Safeguard mechanism?

Gorgon is covered by the Commonwealth Government’s safeguard mechanism. This policy is intended to limit emissions increases from large industrial and extractive facilities in Australia. Every facility has ‘baseline’, or emissions limit. Companies with facilities that breach their limit may need to buy offsets to cover the breach.

Gorgon’s emissions limit is a ‘calculated baseline’ based on Chevron’s projection of emissions from the project.<sup>13</sup> Specifically, the limit is set at the emissions projected by Chevron for the year of highest production (of LNG) in the first five years of operation.

The emissions limit for ‘Gorgon Operations’ is set at 8.3Mt CO<sub>2</sub>-e per year.<sup>14</sup> ‘Gorgon Upstream’ and ‘Gorgon Downstream’ are listed as separate facilities with their own much smaller limits, together bringing Gorgon’s *total* emissions limit to 8.7Mt per year.

It is unclear when the projections used to set Gorgon’s emission limit assume CCS will be operational. The Clean Energy Regulator says all details of the projection are confidential.<sup>15</sup> However it appears the Gorgon emissions limit does not include operational CCS.

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<sup>11</sup> Milne (2018) *Chevron Gets Lifeline on Delayed Gorgon Capture*, <https://thewest.com.au/business/energy/chevron-gets-lifeline-on-delayed-gorgon-carbon-capture-ng-b88992451z>

<sup>12</sup> Senate Environment and Communications Committee (2018) *Question on Notice 164*, <https://www.aph.gov.au/api/qon/downloadestimatesquestions/EstimatesQuestion-Committeeld3-EstimatesRoundld3-Portfoliold17-QuestionNumber164>

<sup>13</sup> A calculated baseline is the projected emissions in the year of projected highest production (of LNG) in its first five years of operation:

CER (2018) *Calculated Baseline*, <http://www.cleanenergyregulator.gov.au/NGER/The-safeguard-mechanism/Baselines/Calculated-baseline>

<sup>14</sup> CER (2018) *Safeguard baselines table*, <http://www.cleanenergyregulator.gov.au/NGER/National%20greenhouse%20and%20energy%20reporting%20data/Safeguard-baselines-table#Safeguard-baselines-table>

<sup>15</sup> CER Personal communication.

Chevron says CCS will reduce the project's emissions by around 40%:

The Project plans to inject between 3.4 and 4 million tonnes of reservoir CO<sub>2</sub> each year. This will reduce greenhouse gas emissions from the Gorgon Project by approximately 40 percent.<sup>16</sup>

It is unclear whether this refers to peak production, or is averaged over the life of the project. At any rate, we can infer the (average or peak) total CO<sub>2</sub> emissions *before* CCS are 8.5 to 10Mt per year, and the CO<sub>2</sub> emissions *after* CCS are at 5.1 to 6Mt per year. Since the emissions limit for the project is 8.7Mt, or 8.3Mt just for Gorgon Operations, it appears Chevron's emissions limit is based on a year where CCS is not operating.

Despite Chevron's emphasis on CCS at Gorgon, it has set an emissions limit that does not include CCS being operational. Gorgon will face no penalty for this failure under the safeguard mechanism.

If Gorgon's CCS had been projected as operational from the beginning, the baseline would have been set at a level assuming CCS operates. It therefore would have imposed an obligation if CCS failed.

All details about Chevron's projection are confidential. We cannot even find out what date Chevron applied for the limit.<sup>17</sup> However it appears to be late 2017, after Gorgon had operated for a year without CCS and as production continued to ramp up.

Gorgon's emissions limit was as 'updated' in November 2017<sup>18</sup> and the Clean Energy Regulator advised this was Chevron's first emissions limit.<sup>19</sup> The last deadline to submit that limit was 31 October 2017.<sup>20</sup> In December 2017, Chevron reported to the WA Government that Gorgon's CCS would be delayed again.<sup>21</sup> If Chevron submitted its limit in late 2017, it likely knew at the time that CCS would not be operational soon.

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<sup>16</sup> Chevron (2018) Gorgon carbon dioxide injection project, <https://australia.chevron.com/-/media/australia/publications/documents/gorgon-co2-injection-project.pdf>

<sup>17</sup> CER Personal communication.

<sup>18</sup> Table updated in November for Gorgon Operations, projections lodged beforehand. CER (2018) *Safeguard baselines table* <http://www.cleanenergyregulator.gov.au/NGER/National%20greenhouse%20and%20energy%20reporting%20data/Safeguard-baselines-table#Safeguard-baselines-table>

<sup>19</sup> Prior to this it had the default baseline of 100,000 tonnes CO<sub>2</sub>e.

<sup>20</sup> CER Personal communication

<sup>21</sup> Milne (2017) *Carbon hiccup for Chevron with 5 million-tonne greenhouse gas problem at Gorgon LNG plant* <https://thewest.com.au/business/oil-gas/carbon-hiccup-for-chevron-with-5-million-tonne-greenhouse-gas-problem-at-gorgon-lng-plant-ng-b88694565z>

Moreover, this was during the ramp up of production. LNG production started in March 2016, ramping up in October 2016 and again in March 2017.<sup>22</sup> The 2017-18 year would have been projected as having higher production and it appears it, or a later year, was projected assuming CCS was not operational.

If CCS does not become operational Chevron may still be at risk of breaching the safeguard mechanism. Chevron reports that 'Gorgon Operations' emitted 7.7Mt CO<sub>2</sub>-e in 2016-17.<sup>23</sup> The emissions limit was 8.3Mt. So during the ramp-up of production, Gorgon came within 0.6Mt of hitting its limit under the safeguard mechanism. Emissions are likely to be higher in 2017-18, with increased production.

Facilities that breach their emissions limit may be required to purchase offsets. This can be avoided however if they can bring down emissions in future year to keep the three year average below the emissions limit.

## Cost of offsetting Gorgon's failing CCS

If Gorgon were required to offset the emissions it did not sequester, it might do this by purchasing Australian Carbon Credit Units (ACCUs).

The average price of ACCUs following the sixth government auction in December 2017 was \$13.08. Offsetting 4Mt of CO<sub>2</sub> at this price would cost \$52 million. It would likely cost Gorgon more as lower cost abatement options are generally exhausted first.

If CCS continues to fail while the world and Australia takes action in line with the Paris Agreement, the cost of offsetting could be ten times greater. This is according to the projected carbon price in such a scenario put forward by the Climate Change Authority.<sup>24</sup>

## Conclusion

Despite being widely lauded as a success story for CCS, the Gorgon LNG Project has failed to sequester CO<sub>2</sub> as promised over its first two years. This has led to millions of

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<sup>22</sup> WA DJTSI (2018) *WA Liquefied Natural Gas Industry Profile* <https://www.jtsi.wa.gov.au/docs/default-source/default-document-library/wa-lng-profile-0218.pdf?sfvrsn=8>

<sup>23</sup> Gorgon Upstream and Downstream are listed as separate facilities with far smaller emissions limits. CER (2018) *2016-17 Safeguard facility reported emissions*, <http://www.cleanenergyregulator.gov.au/NGER/National%20greenhouse%20and%20energy%20reporting%20data/safeguard-facility-reported-emissions/safeguard-facility-emissions-2016-17>

<sup>24</sup> See Ogge (2018) *NT Options for the implementation of Recommendation 9.8 of NT Fracking Inquiry* [http://www.tai.org.au/sites/default/files/P637%20NT%20offset%20paper%20%5BWEB%5D\\_0.pdf](http://www.tai.org.au/sites/default/files/P637%20NT%20offset%20paper%20%5BWEB%5D_0.pdf)

tonnes of additional emissions, likely at least half as large as the increase in national emissions last year. Chevron will not however face a penalty for this. It does not face penalties for breaching its Western Australian approval, and the WA government remains ambiguous about when it would require Chevron to purchase offsets. It has set an emissions limit for itself under the safeguard mechanism that does not include operational CCS.

# High Carbon from a Land Down Under

## Quantifying CO<sub>2</sub> from Australia's fossil fuel mining and exports

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*Australia is the world's third biggest exporter and fifth biggest miner of fossil fuels by CO<sub>2</sub> potential. Its exports are behind only Russia and Saudi Arabia, and far larger than Iraq, Venezuela and any country in the EU. Yet Australia's economy is more diverse and less fossil fuel intensive than many other exporters. Australia has an opportunity and obligation to decarbonise its exports in line with the Paris Agreement.*

July 2019

Tom Swann



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Level 1, Endeavour House, 1 Franklin St  
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Tel: (02) 61300530

Email: [mail@tai.org.au](mailto:mail@tai.org.au)

Website: [www.tai.org.au](http://www.tai.org.au)

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# Summary

Australians pride themselves on their country's natural environment, and Australian governments have carefully curated a global image as an oasis of natural wonder. The reality, however, is far darker.

Australian government Ministers argue Australia's emissions are small on a global scale. They use this as an excuse for delaying effective action on climate. On any reasonable assessment of the data, Australia is a large emitter with a profound global obligation to reduce emissions, not to mention economic and security self-interest.

Australia has just 0.3% of the world population but produces 1.2% of world emissions, making it the 14<sup>th</sup> largest emitter globally. Australia emits more greenhouse gases than 40 countries that have bigger populations than Australia. Per capita, Australia's emissions are the highest in the OECD and globally behind only smaller petro-states like Qatar.

Australian domestic emissions are rising, not falling, and have hit levels not seen since 2011. Land sector aside, emissions have risen almost continuously for two decades. Yet these rising domestic emissions are only a fraction of Australia's role in fuelling the climate crisis.

Australia is a vast coal and gas exporter. From 2000 to 2015 Australian coal exports more than doubled and Liquified Natural Gas (LNG) exports tripled, and since then LNG exports have nearly tripled again. Australia is the largest coal exporter in the world and on recent reports the largest LNG exporter too.

To quantify the climate impacts of Australia's fossil fuel exports, this report compiles the most recent complete International Energy Agency (IEA) datasets for coal, oil and gas production and exports from all countries. These data are multiplied by emissions factors from the Intergovernmental Panel on Climate Change (IPCC). The database is then used for descriptive analysis.

Australia is the fifth biggest miner of fossil fuel carbon, behind China, the USA, Russia and Saudi Arabia. Australia mines more fossil fuel carbon than Indonesia, India, Canada, Iran and Iraq. Australia makes up 4% of global fossil fuel mining by CO<sub>2</sub> potential.

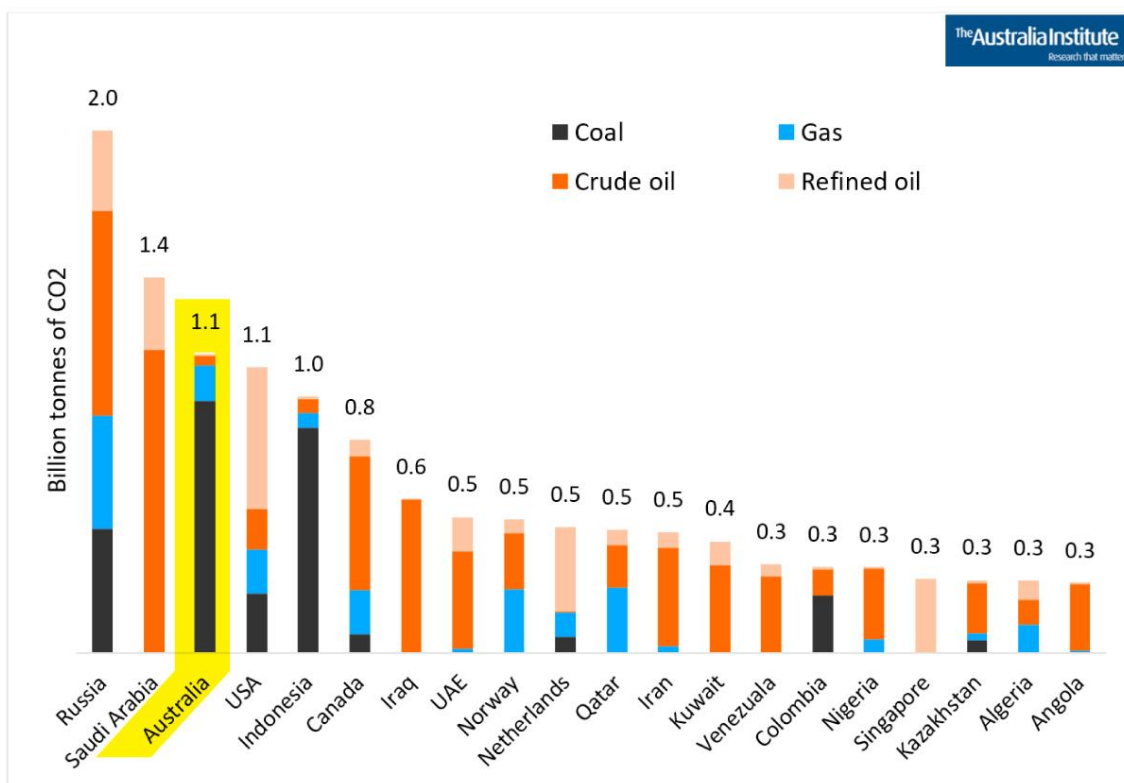
For every Australian, the country mines 57 tonnes of fossil fuel CO<sub>2</sub> per year. That is ten times greater than the world average.

While Australia mines large amounts of carbon per capita, the Australian *economy* is less fossil fuel intensive than other exporters, being diverse and based largely on services. Australia is the 29<sup>th</sup> most fossil fuel intensive considered in terms of GDP.

Most of Australia's fossil fuel production is exported. The CO<sub>2</sub> potential of these exports is more than twice as much as the greenhouse gas emissions Australia emits domestically.

Australia is the third biggest fossil fuel exporter globally, in CO<sub>2</sub> potential.

**Figure: World's biggest fossil fuel exporters, CO<sub>2</sub> Gt potential of exports**



Source: IEA (2018) *World Energy Balances*; IPCC (2006) *IPCC Guidelines*, as described in text; Commonwealth of Australia (2019) *Quarterly Update of Australia's National Greenhouse Gas Inventory for September 2018*

Australia comes behind only Russia and Saudi Arabia. Australia's fossil fuel exports are bigger than exports from Indonesia, Canada, Iraq, UAE or Qatar, and nearly four times bigger than exports from Venezuela and Colombia.

On the most recent complete IEA data, Australian fossil fuel exports are just ahead of to those from the United States of America (USA). That is despite the USA having a population 13 times larger, GDP 15 times larger and export value 8 times larger.

Australia makes up 7% of all fossil fuel exports by CO<sub>2</sub> potential. Most traded fossil fuels are oil but, unusually, Australia's fossil fuel exports are dominated by coal. Australia makes up 29% of world coal trade by CO<sub>2</sub> potential. Australian gas exports are 6% of world gas trade.

Australia's fossil exports can also be compared with in various country groupings.

- In the **OECD**, Australia is the largest fossil fuel exporter in CO<sub>2</sub> potential, making up 20% of the OECD total.
- In the **G20**, Australia makes up 12% of fossil fuel exports, with the highest exports per capita and second highest production per capita.
- In the **Commonwealth**, Australia is the largest fossil fuel miner and exporter, with a full third of Commonwealth exports by CO<sub>2</sub> potential.
- Compared with the **European Union**, Australia's fossil fuel exports are 74% as large as all of those from all EU countries together, and more than twice as big as any EU country. Australia's fossil fuel production is one and a half times the size of the EU countries' production put together.
- Australia's exports are equal to a quarter of all the exports from the Organisation of the Petroleum Exporting Countries (**OPEC**).

Australia is a massive fossil fuel exporter, but its exports overall are far more diversified and less dominated by fossil fuel than many other exporting countries. Relative to the value of a country's overall exports, Australia is the 24<sup>th</sup> biggest fossil fuel exporter. Australian exports vastly more fossil fuel carbon than many exporting countries, despite its overall exports being vastly less fossil fuel intensive. Australia exports nearly twice as much CO<sub>2</sub> potential as Iraq and yet compared to the value of exports, Australian exports are half as CO<sub>2</sub> intensive as Iraq's.

Australia has a unique opportunity, and obligation, to face up to the climate crisis through policies to limit its carbon exports, starting with a moratorium on new coal mines. Coal makes up more than 80% of Australia's exported fossil fuel CO<sub>2</sub> potential.

Those in the global community making efforts to confront the climate crisis should understand the scale of Australia's fossil fuel exports and policies to expand them.

Exports are often ignored in official climate change policy. Treaties and status quo debate focuses on demand for carbon, rather than supply. This ignores the fact that increasing supply and supply infrastructure will tend to "lock in" increased emissions.

The scale of exports from countries like Australia bring into stark relief why efforts to reduce world emissions must limit both demand *and* supply.

# Introduction

Australians pride themselves on their country's natural environment. Tourism Australia has long advertised the country as an oasis of natural wonder: pristine beaches and varied landscapes, capital cities cradled by clear blue waterways and covered by even bluer skies, with not a whiff of pollution in sight. Such an advertising campaign was even overseen by Australia's current Prime Minister Scott Morrison, in his former role as the head of Tourism Australia.

The careful curation of Australia's global image has been assisted by its large land mass and modest population. The reality is far darker.

Australia is a major greenhouse gas polluter, with higher emissions than 90% of countries and among the highest emissions per capita in the world. But this is only one small part of Australia's growing carbon footprint.

Australia extracts and exports vast amounts of coal and gas. The greenhouse gases from these exports are far bigger than emissions from within Australia, putting Australia among Russia and Saudi Arabia in terms of fossil fuel exports.

Australian governments are actively promoting *even greater* coal and gas exports. Australian politicians work hard to avoid confronting the climate impacts of Australian fossil fuel impacts, but the reality is those impacts are enormous.

Time to uncover its true size.

# Australia's domestic emissions

In Australian political debate, those seeking to delay or limit climate action often argue that Australia produces a small share of global emissions. The Treasurer Josh Frydenberg, in his former role as Minister for Environment stated:

while Australia's share of the global carbon footprint is just 1.3 per cent, Australia is playing its part on the world stage through bilateral and multi-lateral initiatives and the ratification of the Paris Agreement to reduce our emissions by 26 to 28 per cent on 2005 levels by 2030 - one of the largest reductions on a per capita and GDP intensity basis in the G20.<sup>1</sup>

The Treasurer's statement is misleading. Australia's current Paris targets not in per capita or per GDP terms, but absolute terms. Moreover, the data show that Australia's emissions per capita and per GDP are very high. This increases the obligation on Australia to cut emissions.

## ABSOLUTE TERMS

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Australia is a heavy emitter in terms of total domestic emissions.

(Data in this section are from 2016, include all greenhouse gases but exclude the land sector.)

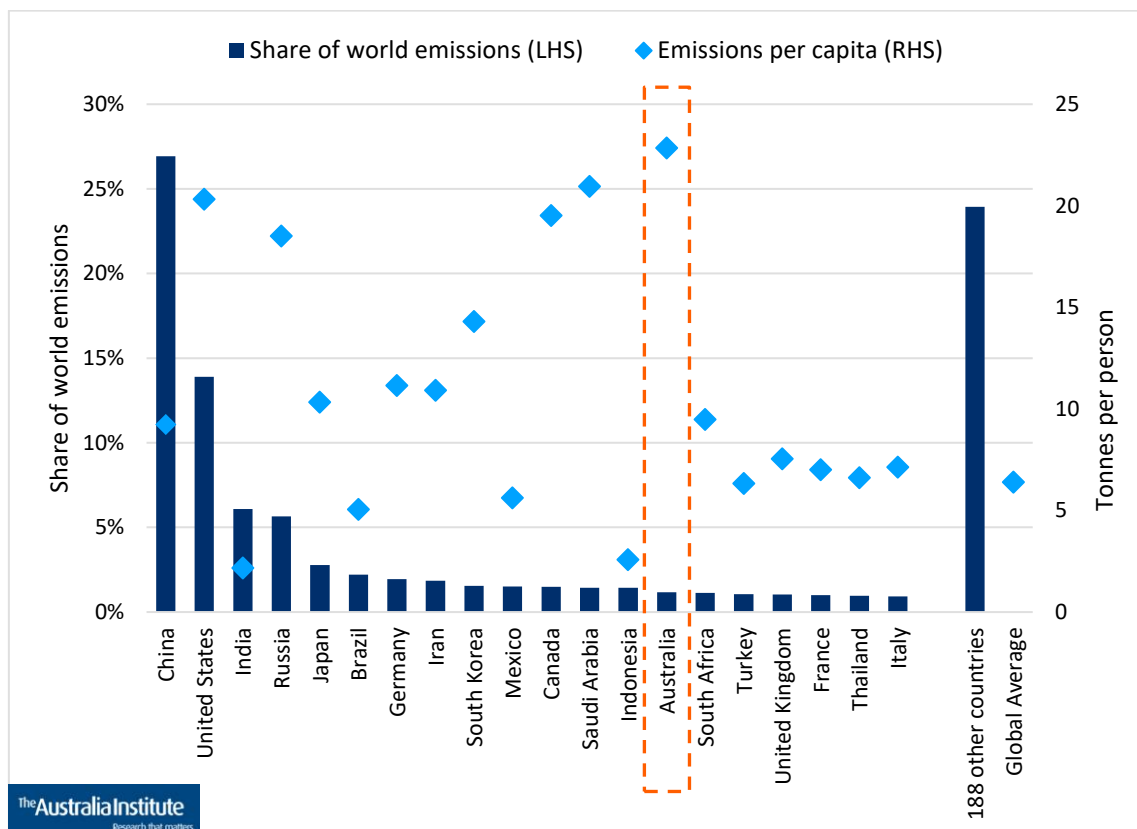
In 2016 Australia emitted 1.2% of world greenhouse gas emissions. This made Australia the world's 14<sup>th</sup> biggest emitter of greenhouse gas pollution,<sup>2</sup> despite having just 0.3% of world population. (See Figure 1).

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<sup>1</sup> Minister for the Environment, the Hon Josh Frydenberg (2017) *Media Release: 2017 review of climate change policies final report released*, <http://www.environment.gov.au/minister/frydenberg/media-releases/mr20171219.html>

<sup>2</sup> All Kyoto GHG, excluding LULUCF, 2016 PIK data, accessed via WRI (2019) *Climate Watch*, <https://www.climatewatchdata.org/>

**Figure 1: Top 20 biggest GHG emitting countries (2016, ex LULUCF)**



Source: All Kyoto GHG, excluding LULUCF, 2016 PIK data, accessed via WRI (2019) *Climate Watch*, <https://www.climatewatchdata.org/>; World Bank (2017) *Population – 2016*, <https://data.worldbank.org/indicator/sp.pop.totl?end=2016&start=2016>

Australia's 2016 emissions were greater than those of 190 countries.<sup>3</sup> If Australia should not have to reduce emissions, then neither should these 'lower' emitting countries. These 'lower' emitting countries are home to 42% of the world population (3.1 billion people) that together emit 30% of world emissions.

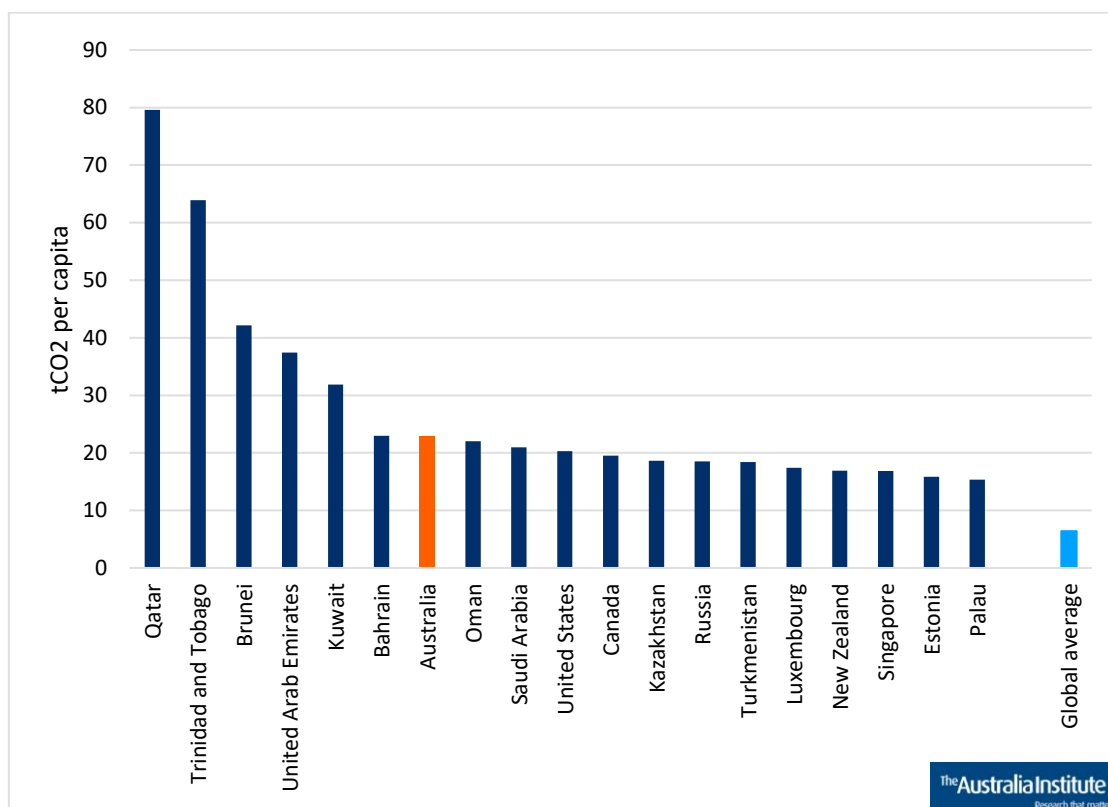
40 countries that emit less than Australia nonetheless have a bigger population than Australia. This includes Turkey, United Kingdom, France, Thailand, Italy and Pakistan.

## PER CAPITA

Per capita, Australian emissions are the highest in the OECD and among the highest in the world. The only countries with higher per capita emissions than Australia are smaller petro-states like Kuwait, Qatar and UAE.

<sup>3</sup> NB: Datasets differ on what counts as a country. This dataset includes some smaller territories that have some independence from the nation state with formal recognition at the United Nations.

Figure 2: Emissions per capita - top 20 countries



Source: All Kyoto GHG, excluding LULUCF, 2016 PIK data, accessed via WRI (2019) *Climate Watch*, <https://www.climatewatchdata.org/>; World Bank (2017) *Population – 2016*, <https://data.worldbank.org/indicator/sp.pop.totl?end=2016&start=2016>

## EMISSIONS INCREASING

Though Australia has signed the Paris Agreement, its emission reduction target is an inadequate contribution to the global goal of limiting warming<sup>4</sup> and Australia's government refuses to consider increasing it. Instead, Australia's government plans to cut the target in half by using 'carry-over' credits from the Kyoto Protocol, despite this being unauthorised under the Agreement and opposed by many other countries.<sup>5</sup>

Even then, Australia is *not* on track to meet the target. Australian emissions are increasing, not decreasing.

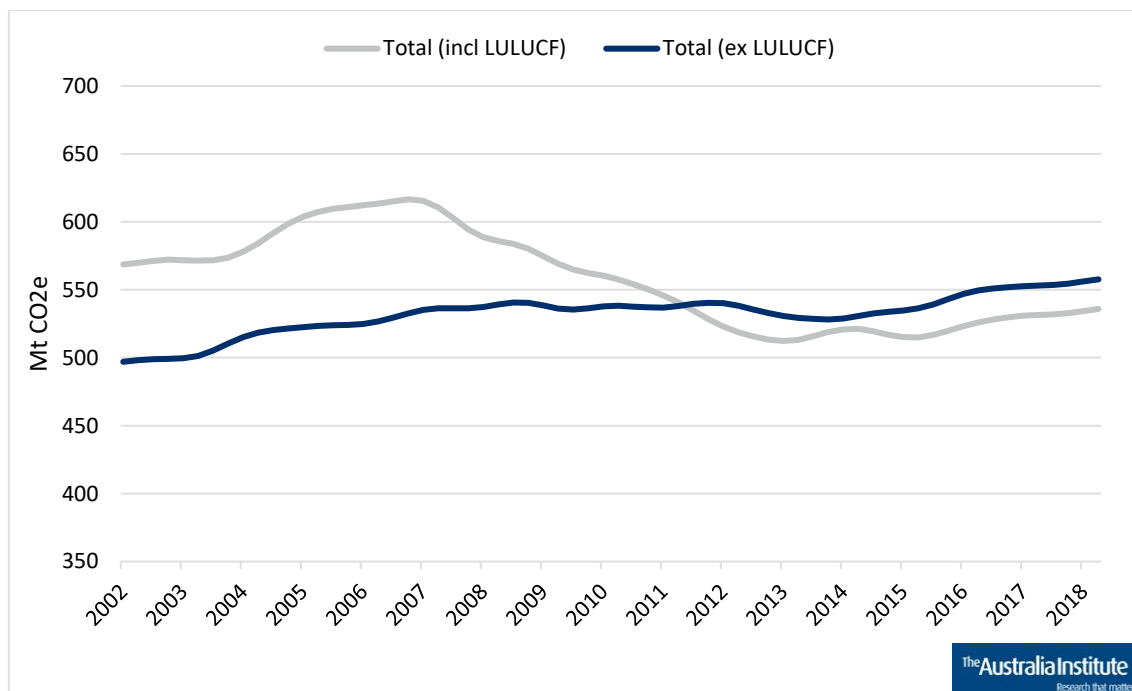
<sup>4</sup> Merzian and Campbell (2018) *Advance Australia's Fair Share*, <http://www.tai.org.au/content/advance-australias-fair-share>

<sup>5</sup> Merzian (2019) *Taking Way Too Much Credit*, <http://www.tai.org.au/content/taking-way-too-much-credit>



Due to the lack of credible climate policy, Australia's emissions have increased every year since 2015 and are now at levels not seen since 2011.<sup>6</sup> Land sector aside, emissions have never been higher.

**Figure 3: Australia's rising emissions - year to date, with and without land sector**



Source: Commonwealth of Australia (2019) *Quarterly Update of Australia's National Greenhouse Gas Inventory for September 2018*

Over the past two decades, emissions fell from 2007 onwards due to changes in Land Use, Land Use Change and Forestry (LULUCF), also called the 'land sector'. Changes to land clearing laws saw these emissions fall rapidly and the land sector is now a small sink (sequestering more greenhouse gases than it releases.)

However, the trend across the rest of the economy has been of emissions rising almost continuously, which has seen total emissions increase now for four years.

From 2012 to 2014, when Australia boasted a world-leading carbon price policy, emissions fell 2% and the economy grew by 5%.<sup>7</sup> In 2014, a new conservative

<sup>6</sup> Commonwealth of Australia (2019) *Quarterly Update of Australia's National Greenhouse Gas Inventory for September 2018*, <https://www.environment.gov.au/climate-change/climate-science-data/greenhouse-gas-measurement/publications#national>

<sup>7</sup> Swann et al (April 2019) *Cold Shower on Economics of Global Warming*, <http://www.tai.org.au/content/analysis-130-billion-year-benefit-gdp-avoiding-climate-change>

government gave Australia the dubious distinction of being first country to repeal its carbon price.

Australia's electricity sector remains dominated by coal power. Under current policy, electricity emissions have fallen, due to increasing renewables. This trend has been more than overpowered by emissions growth in other sectors. Australia's vehicle fleet is also highly fuel-inefficient with a very low number of electric vehicles.

However, a key reason for Australia's increasing emissions is the large expansion in coal and gas production for export. These activities are emissions intensive in Australia, and the exports themselves produce far larger volumes of CO<sub>2</sub> overseas.

# Australia's vast fossil fuel exports

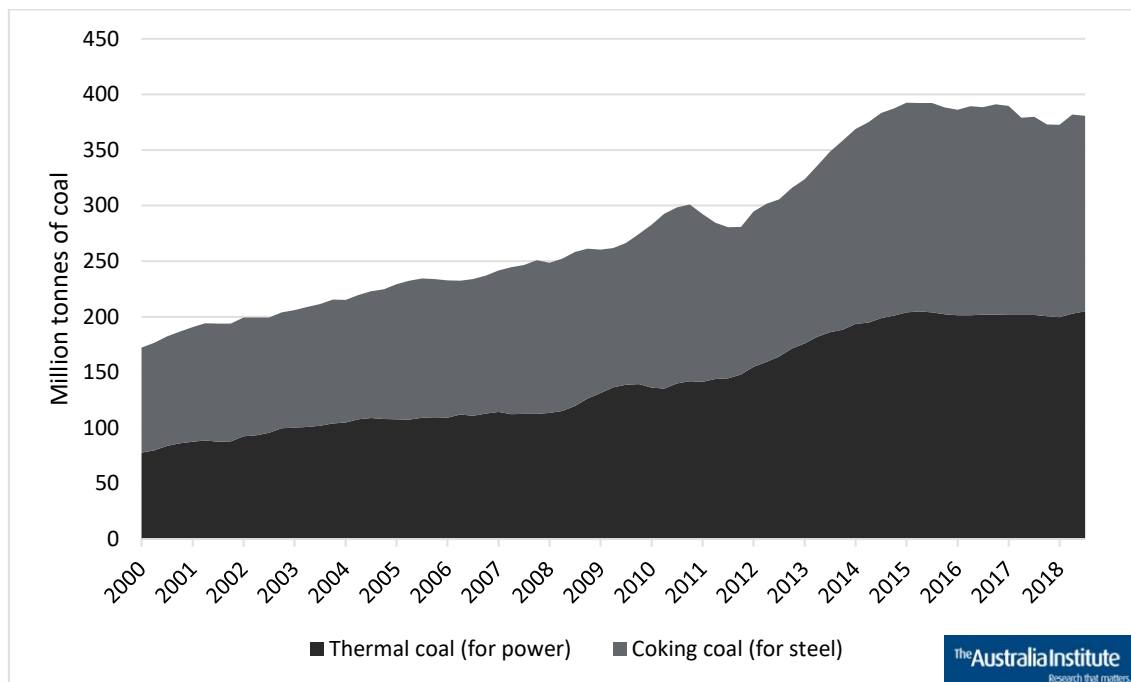
Discussion of climate impacts have traditionally ignored emissions in fossil fuel exports. Examples like Australia show why this needs to change.

## COAL

Australia exports roughly equal volumes of thermal coal, for power plants (mostly from NSW), and coking coal, for making steel (mostly from Queensland).

Over the last two decades, Australian coal exports have more than doubled.

**Figure 4: Coal exports from Australia, year to date, tonnes**



Source: OCE (2018) *Resources and Energy Quarterly December 2018*, rolling annual exports

The data show total coal exports peaked in 2015 and have since levelled. However, government forecasters project exports to increase in coming years and there are plans for many new mines to export even more coal.

There are current proposals for 53 new coalmines in Australia, with total production of 415 million tonnes (Mt) a year.<sup>8</sup> New coal from proposed new mines is even larger than current exports. There are also many proposals to expand existing mines, extending their mine life.

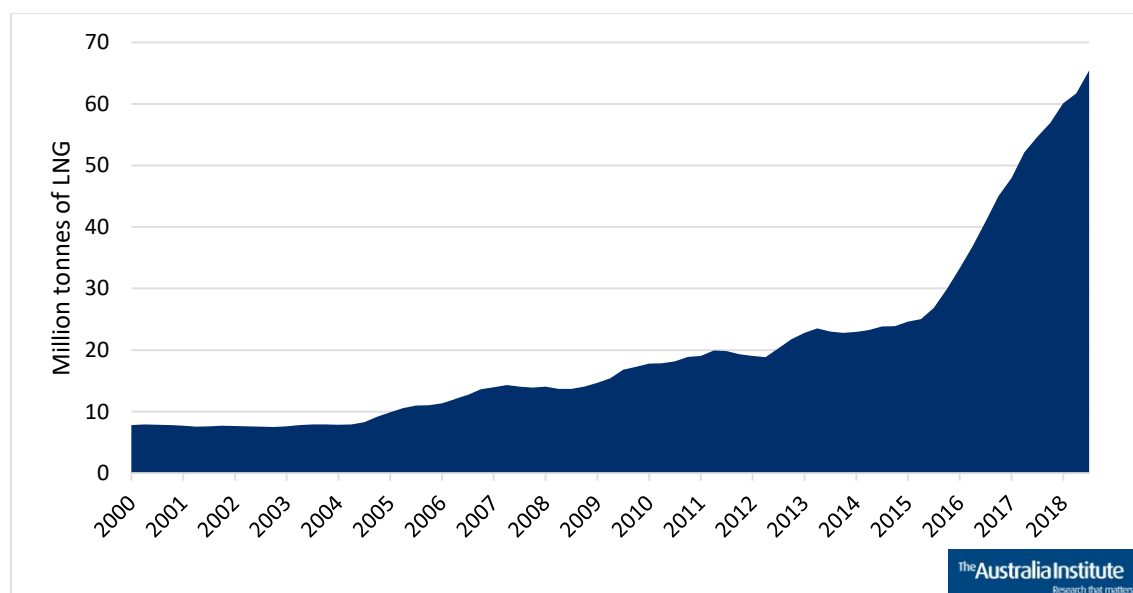
The focus of thermal coal expansion is the Galilee Basin in Queensland, where the frontrunner is the Adani Carmichael mine. The Adani mine has been subject to years of controversy about approvals and plans to subsidise it at every level of government. The Galilee Basin mines would produce thermal coal.

Despite the huge volumes of coal involved, coal mining in Australia employs less than 0.5% of Australia's workforce, five times less than the arts and recreation sector employs.<sup>9</sup>

## GAS

Australia has recently seen a very large expansion in liquid natural gas (LNG) exports, more than doubling in the decade to 2015, then to 2018 more than doubling again.

**Figure 5: Australia's exports of liquid natural gas (LNG)**



<sup>8</sup> OCE (2019) *Major Projects List – December 2018*,  
<https://publications.industry.gov.au/publications/resourcesandenergyquarterlymarch2019/documents/Resources-and-Energy-Quarterly-December-2018-Major-Projects-Data.xlsx>

<sup>9</sup> ABS (2019) 6291.0.55.003 - *Labour Force, Australia, Detailed, Quarterly, Feb 2019*,  
<https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6291.0.55.003Feb%202019?OpenDocument>

Source: OCE (2018) *Resources and Energy Quarterly December 2018*, rolling annual exports

The increase in LNG will continue, with numerous large projects recently finishing construction and 19 proposals for new projects or expansions. Most of the current and proposed production is offshore from the north and north-west of the country. There is also a large onshore industry, increasingly 'fracked' unconventional gas, which has attracted staunch opposition. Australia also exports unrefined oil product, in particular gas condensate.

## FOSSIL FUEL SUBSIDIES

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Australian governments have a long tradition of subsidising mining. State governments have often built mining infrastructure, costing billions. The Adani coal mine has courted numerous taxpayer subsidies, including cash grants, unlimited water licenses, waived rehabilitation requirements and subsidised loans (including deferred royalty payments). Australia's export credit agency has funded numerous fossil fuel project and its mandate was recently expanded to include funding infrastructure to assist Australia fossil fuel exports in current and new markets.<sup>10</sup>

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<sup>10</sup> Swann (May 2019) *Rushed through the Senate when no-one was looking*, <https://medium.com/@TheAustraliaInstitute/rushed-through-the-senate-when-no-one-was-looking-bf1bd2734df3>

# Data and methods

This section describes the data and methods used in later sections to present data on CO<sub>2</sub> potential of fossil fuels produced, and exported, globally.

## DATA

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Energy data are from the International Energy Agency (IEA).<sup>11</sup> This data includes production, exports and imports of fossil fuels, broken down in the main fuel types:

- Coal and coal products
- Natural gas
- Crude, NGL and feedstocks ('primary oil')
- Oil products ('secondary oil' or 'refined')

The analysis uses the most recent complete data set for each fuel type from the 2018 release. 2017 data are used for coal and gas. 2016 data are used for oil.<sup>12</sup>

The IEA gives data in kilotonnes of oil equivalent (ktoe), a standardised energy unit. This data accounts for differing energy content of fuel types (e.g. higher vs lower energy content coal), which is the main factor in their emissions potential.

Emission CO<sub>2</sub> factors for each fuel type are from the Intergovernmental Panel on Climate Change (IPCC).<sup>13</sup> The analysis uses representative default CO<sub>2</sub> factors for each fuel type and assumes full combustion.<sup>14</sup> The calculations are shown in Table 1 below.

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<sup>11</sup> IEA (2018) *World Energy Balances*, from OECD iLibrary

<sup>12</sup> The IEA 2019 statistics were put up for sale in the week prior to publication of this report. They are not yet available to The Australia Institute. The results presented here are unlikely to have changed greatly except where indicated in the text of the report.

<sup>13</sup> IPCC (2016) *2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 2 Energy*, [https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2\\_Volume2/V2\\_1\\_Ch1\\_Introduction.pdf](https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf)

<sup>14</sup> Bituminous coal, natural gas, crude oil, motor oil.

**Table 1: IPCC emissions factors used in this report**

Fuel type	kg CO <sub>2</sub> / TJ	TJ / ktoe	kg CO <sub>2</sub> / ktoe	t CO <sub>2</sub> / ktoe
<b>Coking / other bituminous</b>	94,600	41.868	3,960,713	3,961
<b>Natural Gas</b>	56,100	41.868	2,348,795	2,349
<b>Crude Oil</b>	73,300	41.868	3,068,924	3,069
<b>Motor Gasoline</b>	69,300	41.868	2,901,452	2,901
<i>Reference</i>	<i>IPCC</i>	<i>IEA</i>	<i>Derived</i>	<i>Derived</i>

Source: IPCC (2016) *2006 IPCC Guidelines for National Greenhouse Gas Inventories V2 Energy*, [https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2\\_Volume2/V2\\_1\\_Ch1\\_Introduction.pdf](https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf); IEA (2019) *Unit Converter*, <https://www.iea.org/statistics/resources/unitconverter/>

The IPCC gives default conversion factors for CO<sub>2</sub> potential in terms of energy content in different fuel types. This is given as kilograms of CO<sub>2</sub> per terajoule (TJ). Converting energy and mass units give tonnes of CO<sub>2</sub> per ktoe for each fuel type.

Note there are significant non-CO<sub>2</sub> ‘fugitive’ emissions from fossil fuel extraction, especially gas, which are not included here, as they are domestic emissions. Nearly all of emissions from fuel combustion are CO<sub>2</sub>, which is the focus of this analysis.

Data on Gross Domestic Product (GDP) and the value of exports are from the World Bank in current \$US.<sup>15</sup> Data on population are from the International Monetary Fund.<sup>16</sup> Countries were also coded for membership of groups like the G20, OPEC and OECD.

## ANALYSIS

All energy and socio-economic data were compiled into one database.

Using the conversion factors, data on each country’s coal, gas and oil production and exports were converted into CO<sub>2</sub> potential. Derived data for total exported CO<sub>2</sub> were checked against aggregate data from the United Nations indicators for the Sustainable Development Goals. There was a close correlation for nearly all countries.<sup>17</sup>

<sup>15</sup> World Bank (2019) *World Bank Open Data*, <https://data.worldbank.org/>

<sup>16</sup> IMF (2019) *IMFDataMapper*, <https://www.imf.org/external/datamapper/LP@WEO/OEMDC/ADVEC/WEOWORLD>

<sup>17</sup> The UN gives CO<sub>2</sub> potential of exports per capita; population data was used to extrapolate absolute emissions. Outliers in the UN data compared with the data derived here are primarily countries with major oil refinery industries, suggesting the UN data only includes primary oil exports. The UN data is also incomplete, missing key exporters such as Iran.

The database was used for descriptive analysis of fossil fuel extraction and export in terms of CO<sub>2</sub> potential. Analysis included breakdowns by fuel type and by share of country group total, and per capita, per GDP and per export value.

## ON PRIMARY AND SECONDARY OIL EXPORTS

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Australia exports large amounts of coal and gas but relatively small amounts of oil. However, as shown below, most world fossil fuel exports are oil.

Care is needed with data on oil exports. Crude oil and other extracted hydrocarbons must generally be processed before use. The IEA provides separate data for ‘primary’ oil or as extracted and ‘secondary’ oil or as refined into products for use. Countries may do any of the following for different kinds of oil and in different markets:

- extract and export primary oil;
- extract primary oil, refine it and export refined product;
- extract, refine and consume domestically;
- import primary oil to refine and consume; or
- import primary oil to export refined product.

Refined oil is here excluded from analysis of *produced* or *extracted* fossil fuels. But taking this approach to exports would provide incomplete data.

As shown below, many oil extracting countries refine oil and export refined products alongside primary oil products, including Russia, Saudi Arabia, USA and Iraq. Focusing on primary oil exports and ignoring refined exports would ignore some of the oil extracted and exported from these countries.

For this reason, the analysis of *exported* fossil fuel CO<sub>2</sub> potential here includes the separate data for primary and secondary oil. This approach avoids excluding oil that extracted and refined in the same country.

It also counts some oil flow as both primary export from one country and secondary export from another, via refineries in the latter country. Many countries import primary oil, refine it, and then export it. Singapore and the Netherlands are clear examples.

The approach is appropriate for the present purposes. Refineries are an essential part of the oil supply chain, in both extracting and intermediary countries. Including refined export data best reflects this role. However, it is important to note the export figures do not sum to a figure for ‘total export consumption’.



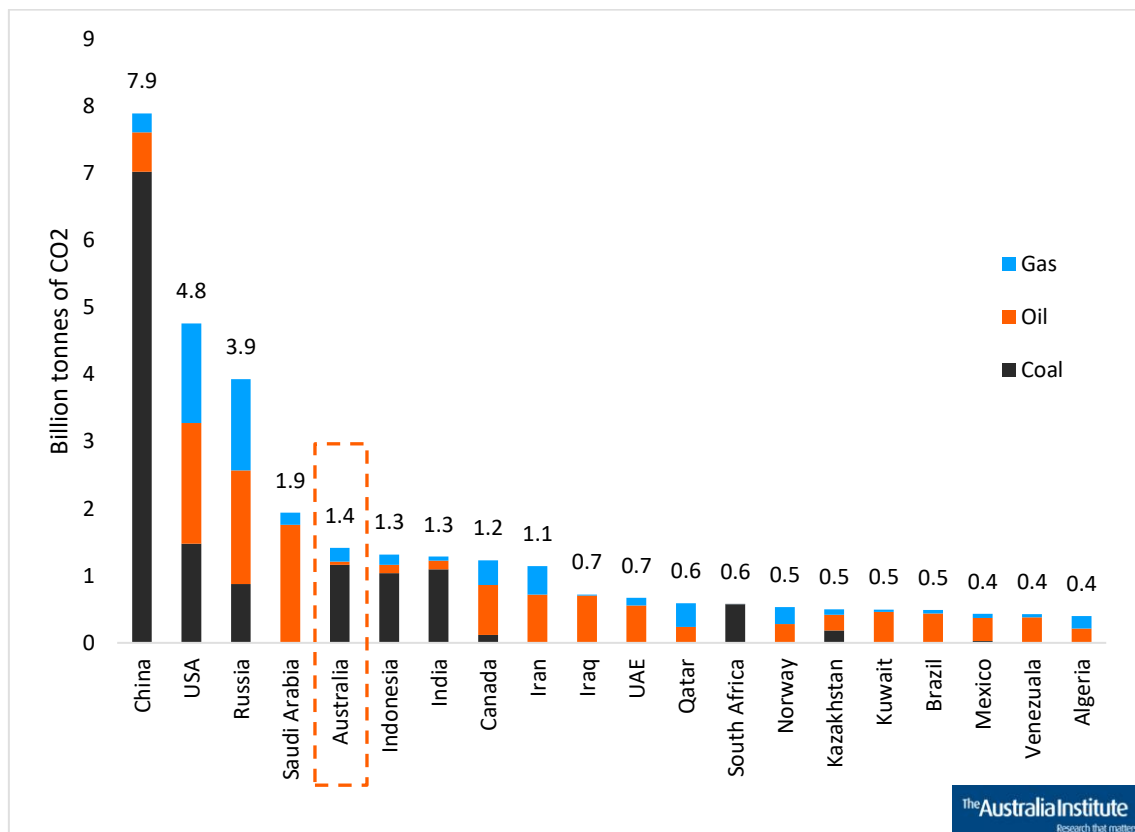
# Australia: the world's fifth biggest miner of fossil fuels

Australia may be the 14<sup>th</sup> biggest emitter, but in terms of total fossil fuels mined, Australia's carbon footprint is far bigger.

The CO<sub>2</sub> footprint of Australia's total fossil fuel production is exports is 1.4 billion tonnes (as of 2017).

This makes Australia the fifth biggest miner of fossil fuel carbon in the world.

**Figure 6: World's biggest fossil fuel mining countries, by CO<sub>2</sub> potential**

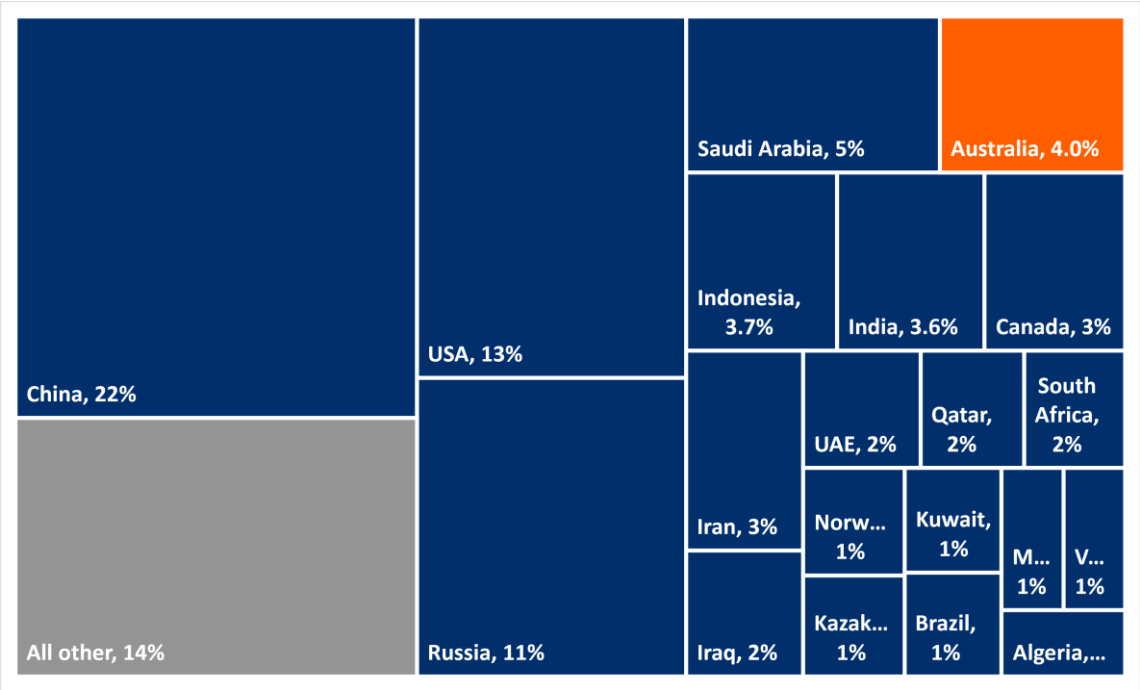


Source: IEA (2018) *World Energy Balances*; IPCC (2006) *IPCC Guidelines*, as described in text

Figure 6 shows that Australia's CO<sub>2</sub> extraction is behind only China, USA, Russia and Saudi Arabia. It is ahead of Indonesia and India and far ahead of Iran, Iraq and Qatar.

Australia has 0.3% of the world population, but mines 4% of the world's fossil fuel CO<sub>2</sub>.

Figure 7: World’s biggest fossil fuel mining countries, by CO2 potential



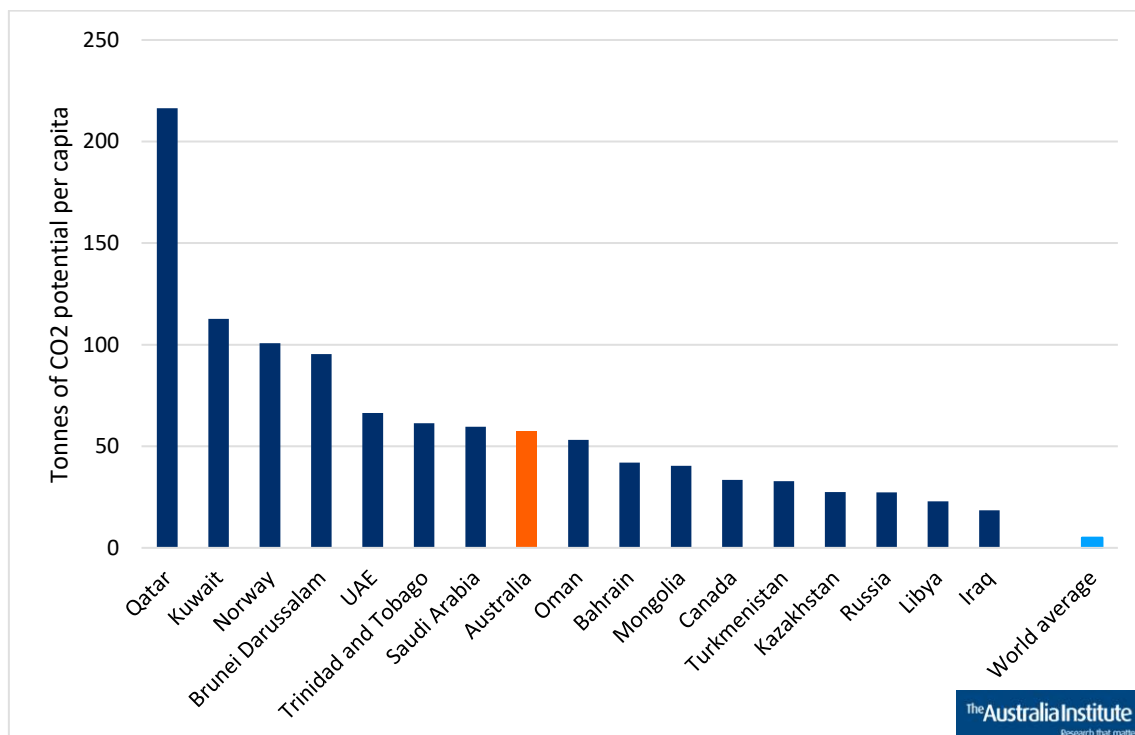
Source: IEA (2018) *World Energy Balances*; IPCC (2006) *IPCC Guidelines*, as described in text

## CO2 MINED PER CAPITA

For every Australian, companies operating in Australia mine 57 tonnes of fossil fuel CO2 per year. That is ten times more than the world average.

To help put that in context, annual CO2 potential from Australian fossil fuel production weighs about the same as 100 cows or 35 mid-size cars per Australian.

**Figure 8: OECD's biggest fossil fuel mining countries, by CO2 potential per capita**



Source: IEA (2018) *World Energy Balances*; IPCC (2006) *IPCC Guidelines*; World Bank (2017) *Population – 2016*; as described in text

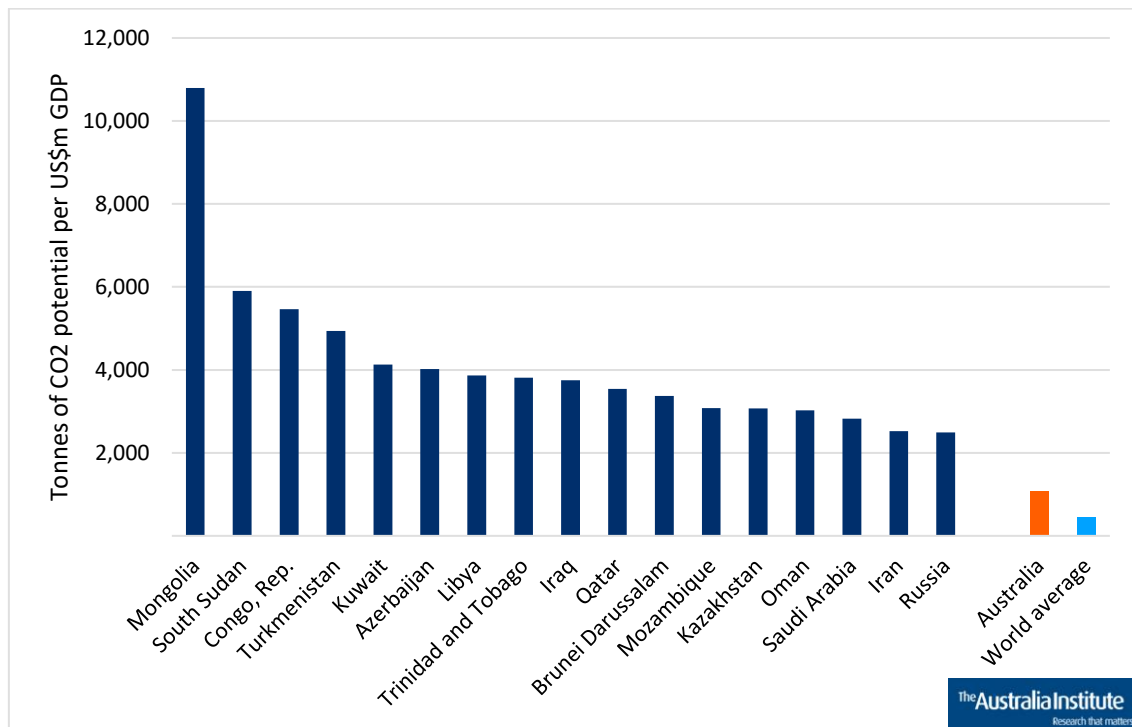
Per capita, Australia is the eighth most fossil fuel intensive country. Australia comes in behind only major oil countries, many with much smaller populations. Among medium sized countries (population 20 million or higher) Australia is second, just after Saudi Arabia.

The only OECD country that mines more fossil fuels per capita is Norway which, like many oil intensive countries, has a smaller population than Australia.

## CO2 MINED PER GDP

Australia's fossil fuel exports have a big impact on the climate but are a modest part of Australia's diversified, services-based economy. Australia is the eighth largest fossil fuel emissions producer per capita (Figure 8 above), yet the 29th largest emissions producer per GDP (Figure 9).

**Figure 9: World's biggest fossil fuel mining countries, by CO2 potential per \$USm GDP**



Source: IEA (2018) *World Energy Balances*; IPCC (2006) *IPCC Guidelines*, as described in text

Figure 9 shows that while Australia produces more fossil fuel CO2 *per capita* than countries like Iraq, Iran, Russia and Kazakhstan, Australia's *economy* is far less dependent on fossil fuel CO2. In other words, Australia has a much more diverse economy than these other countries. Australia has many more sources of income and employment than fossil fuels, unlike countries such as Qatar and Libya, where GDP is dominated by oil and gas production.

Despite being a massive fossil fuel producer, in absolute terms and by population, Australia's economy is far less dependent on fossil fuel carbon than other fossil fuel dependent countries.

This reflects the diverse nature of Australia's economy. Most Australian jobs are in services. Coal mining in Australia employs less than 0.5% of Australia's workforce, five times less than the arts and recreation sector employs.<sup>18</sup> Despite this diversity, Australia is unsurprisingly well above most countries with CO2 per GDP twice the world average.

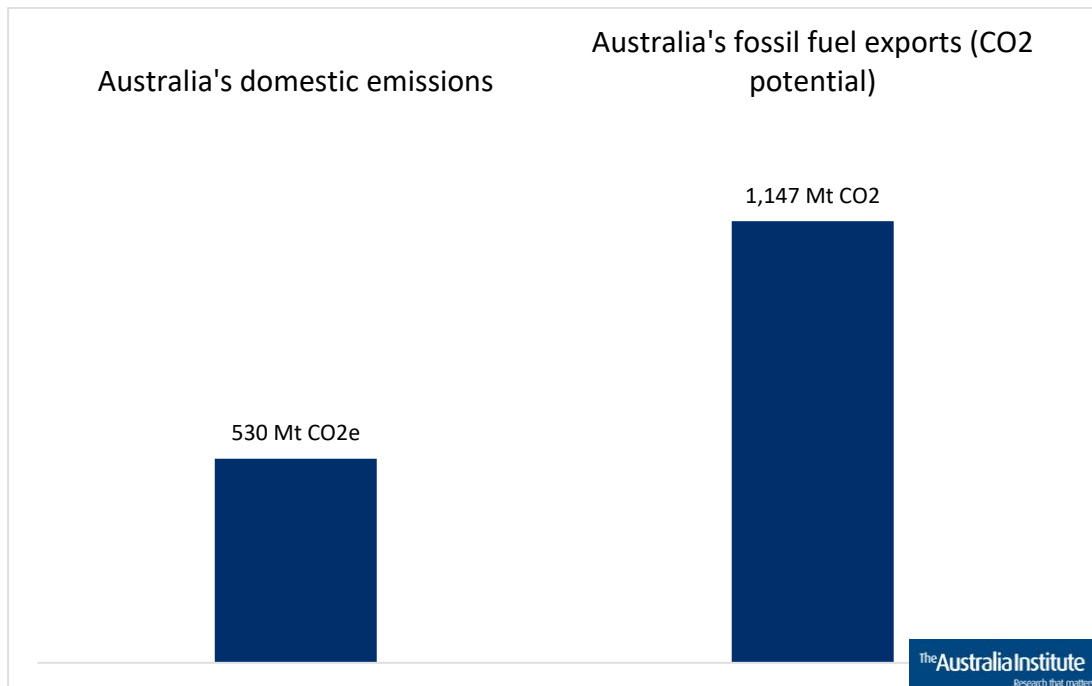
<sup>18</sup> ABS (2019) 6291.0.55.003 - *Labour Force, Australia, Detailed, Quarterly, Feb 2019*, <https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6291.0.55.003Feb%202019>

# Australia: the third biggest fossil fuel exporter

China and the USA both produce a large amount of fossil fuels, but with such large populations they consume much more of what they produce. Australia by contrast, produces fossil fuels well in excess of domestic consumption and most of what is produced is exported.

Australia exports fossil fuels equal to 1.1 billion tonnes of CO<sub>2</sub> a year. This is more than double Australia's domestic emissions, as shown in Figure 10 below:

**Figure 10: Australia's domestic emissions vs fossil fuel exports**

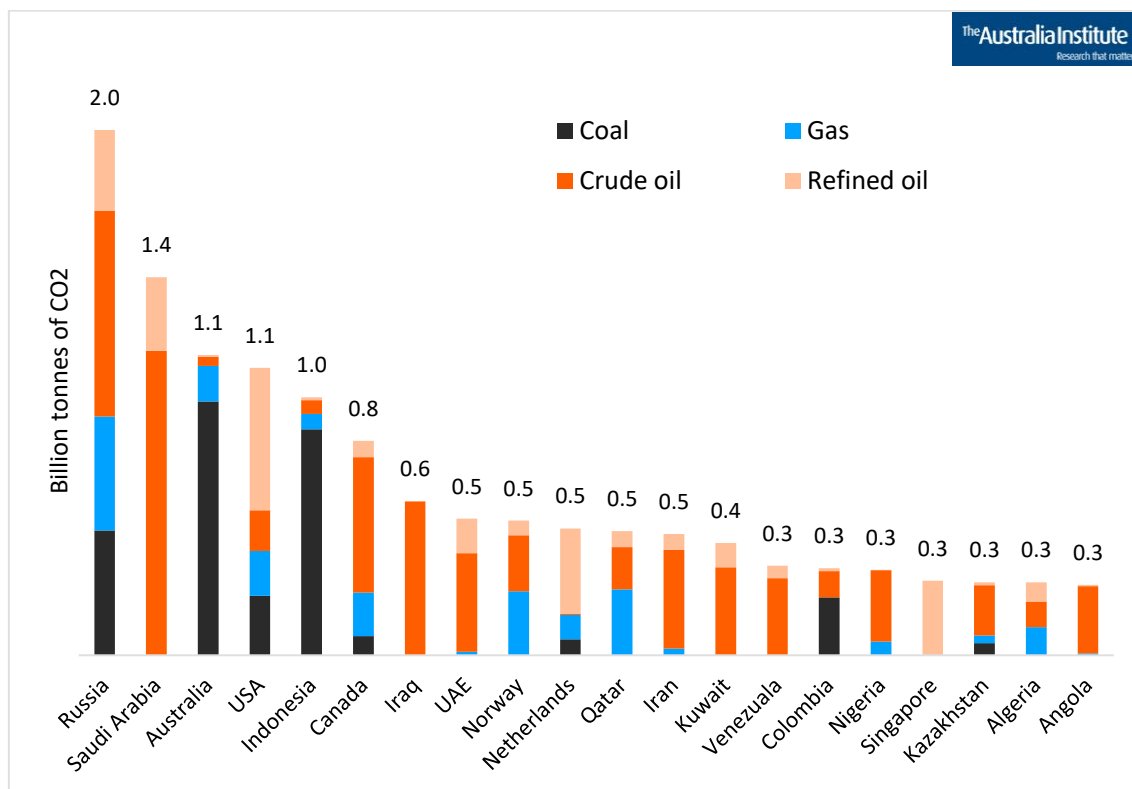


Source: IEA (2018) *World Energy Balances*; IPCC (2006) *IPCC Guidelines*, as described in text; Commonwealth of Australia (2019) *Quarterly Update of Australia's National Greenhouse Gas Inventory for September 2018*

Note the data compared above are from 2017. Both Australia's domestic emissions and its gas emissions are higher in 2019.

Compared with all other countries, Australia is third biggest fossil fuel exporter by CO<sub>2</sub> potential.

**Figure 11: World's biggest fossil fuel exporters, CO2 Gt potential of exports**



Source: IEA (2018) *World Energy Balances*; IPCC (2006) *IPCC Guidelines*, as described in text; Commonwealth of Australia (2019) *Quarterly Update of Australia's National Greenhouse Gas Inventory for September 2018*

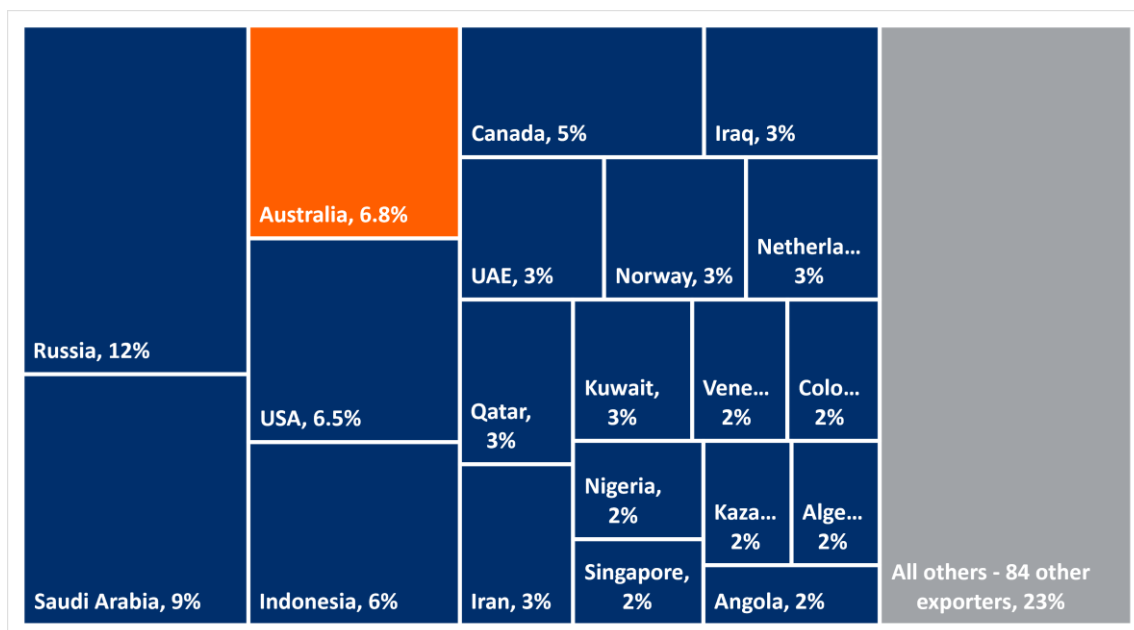
Australian fossil fuel exports come behind only Russia and Saudi Arabia.

Australian fossil fuel exports are comparable to those from the USA, despite Australia's population being 13 times smaller, its GDP 15 times smaller and its exports 8 times smaller.

Australia's fossil fuel exports are bigger than exports from Indonesia, Canada, Iraq, UAE or Qatar, and nearly four times bigger than Venezuela and Colombia.

Australia makes up 7% of global fossil fuel exports.

**Figure 12: World's biggest fossil fuel exporters, CO2 potential**



Source: IEA (2019) *World energy balances*; IPCC (2006) *IPCC Guidelines*, as described in text

As discussed in the method section, the analysis here includes secondary or refined oil products and is based on the most recent complete IEA datasets for each fuel from the April 2019 release: 2017 for coal and gas and 2016 for oil.<sup>19</sup>

The USA has in recent years been exporting increasing amounts both refined and crude oil. Both of these increased in 2017. The USA may soon be a net exporter and may have overtaken Australia. At the same time, Australia's gas exports have increased since 2017 and it is now the world's largest exporter of Liquified Natural Gas (LNG). Complete data for more recent years is needed for this comparison.

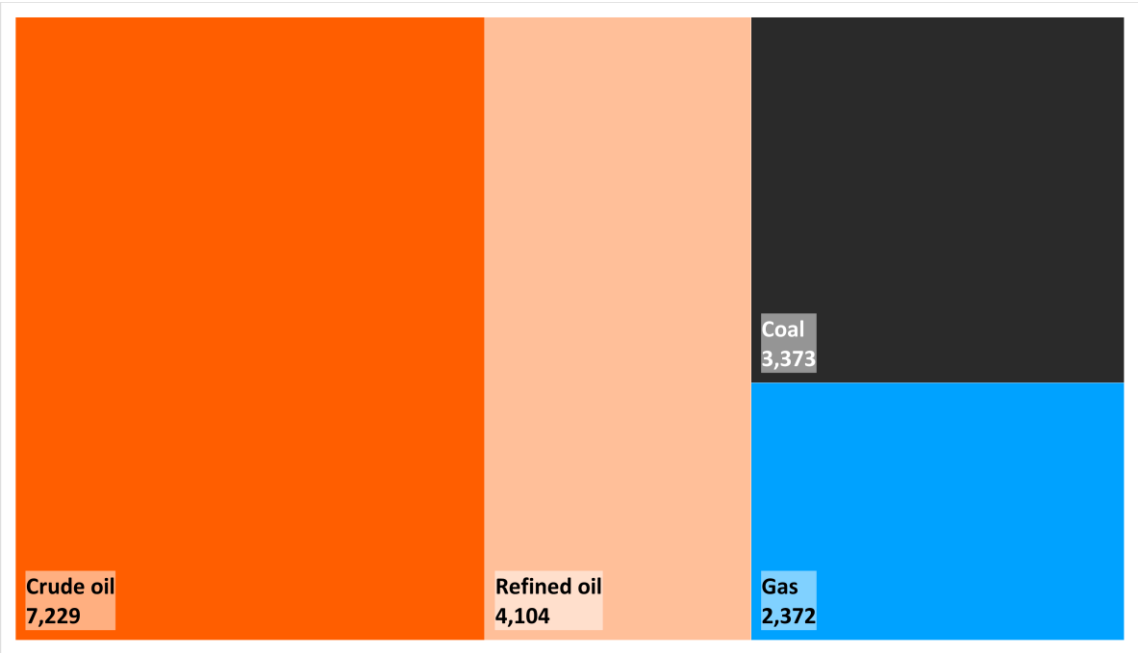
<sup>19</sup> The analysis includes both oil products refined in the country of extraction and where imported for refining. The latter includes the USA, the Netherlands and Singapore. Excluding secondary oil sees these countries all fall much further down the list. The USA is unique among these countries: it is at the same time a major producer, a major exporter and a major importer of different forms of oil.

# COMPARISON OF FUELS

Australia is unusual among fossil fuel exporting countries because Australia’s exports are dominated by coal and gas. Globally, fossil fuel exports globally are dominated by oil – crude oil exports alone exceed both coal and gas.

Australia is the world’s largest coal exporter, responsible for more than a quarter (29%) of world trade.

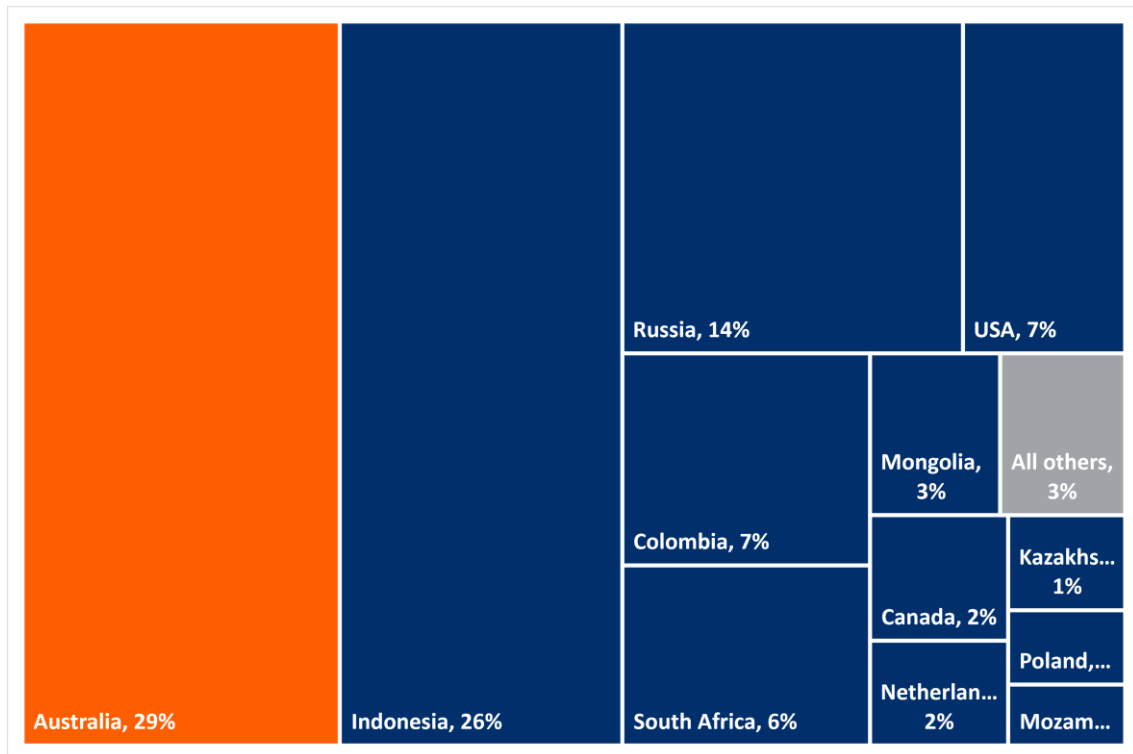
**Figure 13: Global fossil fuel exports by fuel (Mt CO2 potential)**



Source: IEA (2019) *World energy balances*; IPCC (2006) *IPCC Guidelines*, as described in text



**Figure 14: Share of global coal exports**

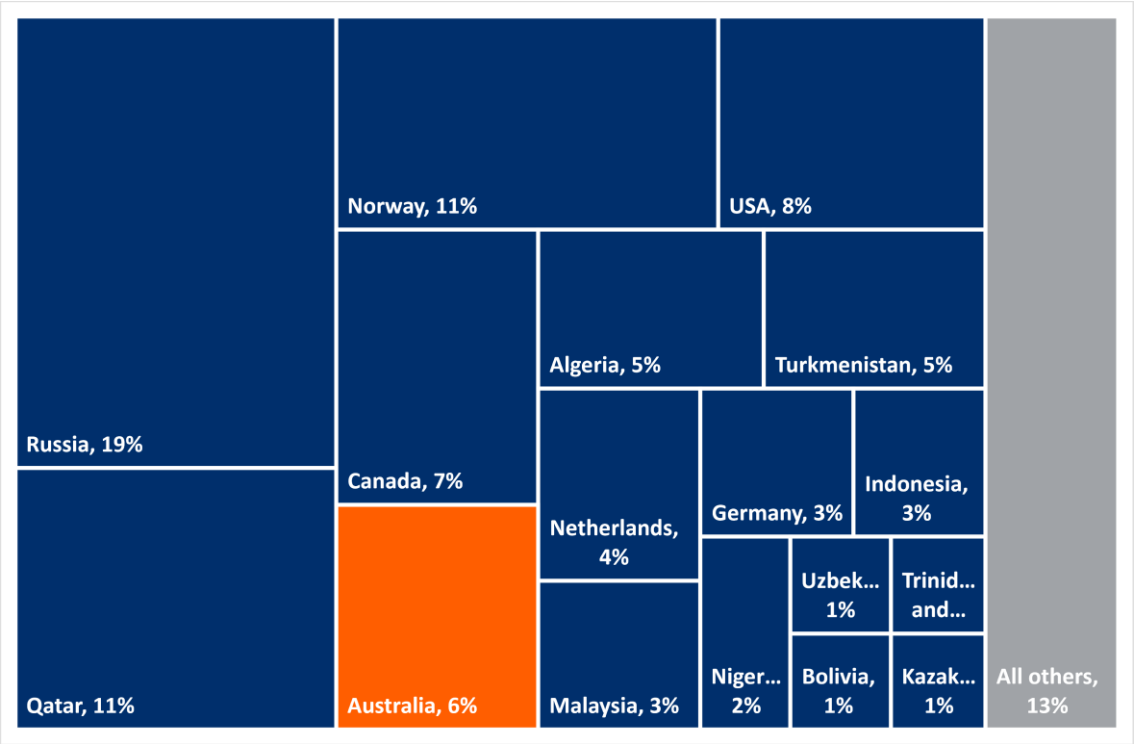


Source: IEA (2019) *World energy balances*; IPCC (2006) *IPCC Guidelines*, as described in text

On the 2017 data, Australia is the sixth biggest gas exporter in the world. Other gas producing countries, like Russia, use pipelines to export gas. Australia's gas exports are LNG. As noted, Australia's LNG exports have increased since 2017. Australia's LNG exports overtook Qatar's in late 2018, making Australia the world's biggest LNG exporter.<sup>20</sup>

<sup>20</sup> Jaganathan (2018) *Australia grabs world's biggest LNG exporter crown from Qatar in Nov*, <https://www.reuters.com/article/us-australia-qatar-lng/australia-grabs-worlds-biggest-lng-exporter-crown-from-qatar-in-nov-idUSKBN1O907N>

Figure 15: Share of global gas exports



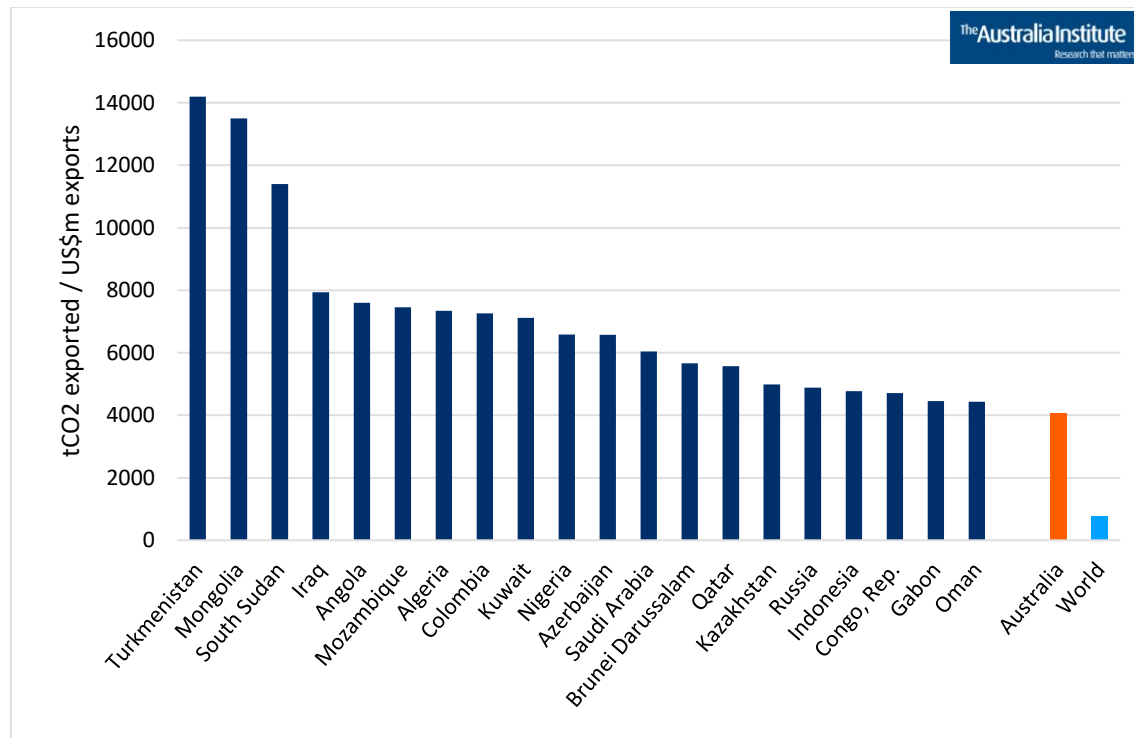
Source: IEA (2019) *World energy balances*

## CO2 EXPORTED PER OVERALL EXPORT VALUE

Australia's exports of fossil fuels are enormous by global standards, but Australia is far less economically reliant on fossil fuel exports than other exporting countries.

The following figures show CO2 exported per value of all exports, and per GDP.

**Figure 16: Fossil fuel intensity of exports (tCO2 exported / US\$m exports)**



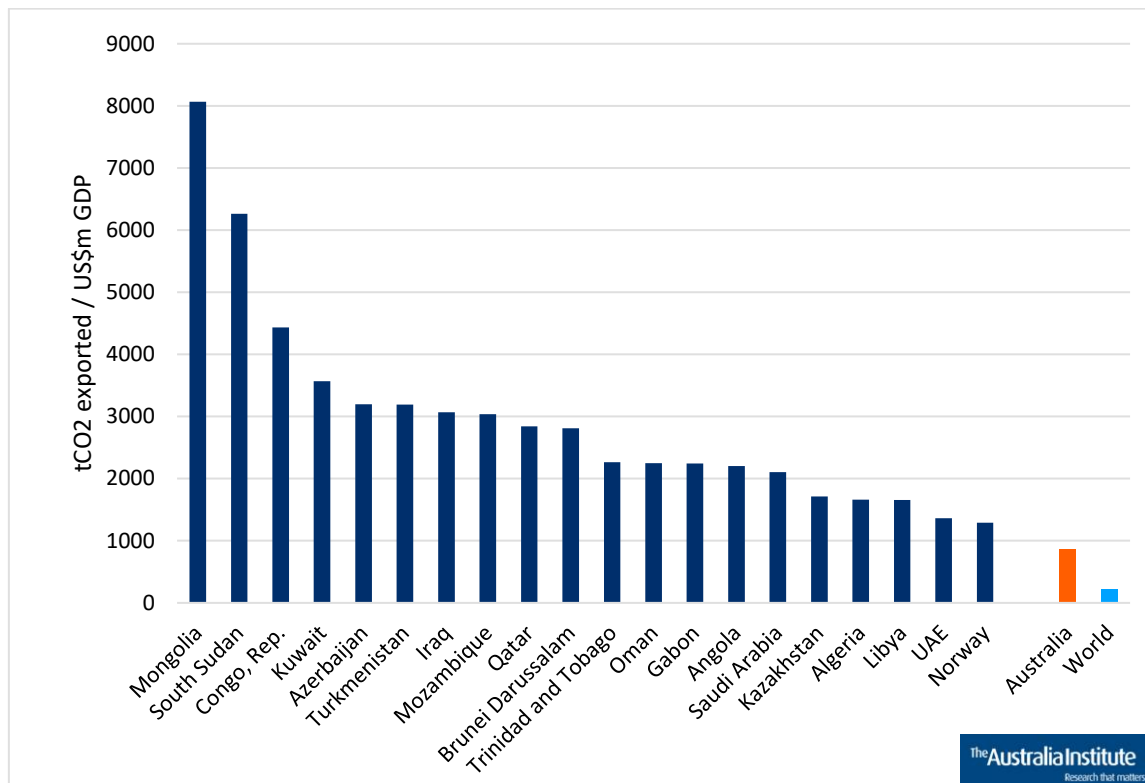
Source: IEA (2019) *World energy balances*; IPCC (2006) *IPCC Guidelines*; World Bank (2019) *World Bank Open Data*, as described in text

Despite being the third biggest fossil fuel exporter globally, Australia's economy is less dominated by those exports than many other exporting economies.

Relative to exports overall, Australia is the 24<sup>th</sup> biggest fossil fuel exporter. Australia exports far more than Mongolia, Iraq, and Mozambique, but Australian exports overall are half as fossil fuel intensive as exports from these countries.

Similarly, relative to GDP, Australia's economy is the 27<sup>th</sup> biggest fossil fuel exporter.

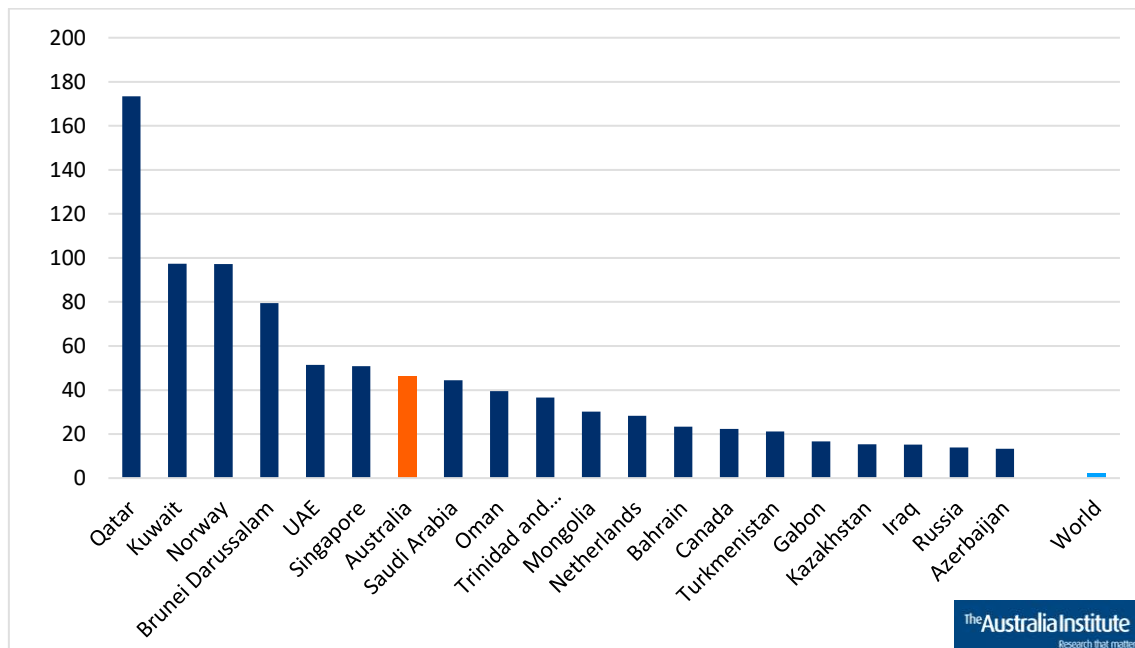
**Figure 17: Fossil fuel export intensity of GDP (tCO<sub>2</sub> exported / US\$m GDP)**



Source: IEA (2019) *World energy balances*; IPCC (2006) *IPCC Guidelines*; World Bank (2019) *World Bank Open Data*, as described in text

These results are even more striking because Australia is the seventh biggest fossil fuel exporter per capita.

**Figure 18: Fossil fuel exports per capita (tCO2 exported per capita)**



Source: IEA (2019) *World energy balances*; IPCC (2006) *IPCC Guidelines*; IMF (2019) *IMFDataMapper*, as described in text

Again, despite very high per capita exported emissions, those exports play a far smaller role in Australia's economy than they do for many other exporting nations.

# Australia and friends

Australia is a huge fossil fuel exporter by world standards, but even bigger in the context of country groups that it is a member of: the OECD, the G20 and the Commonwealth.

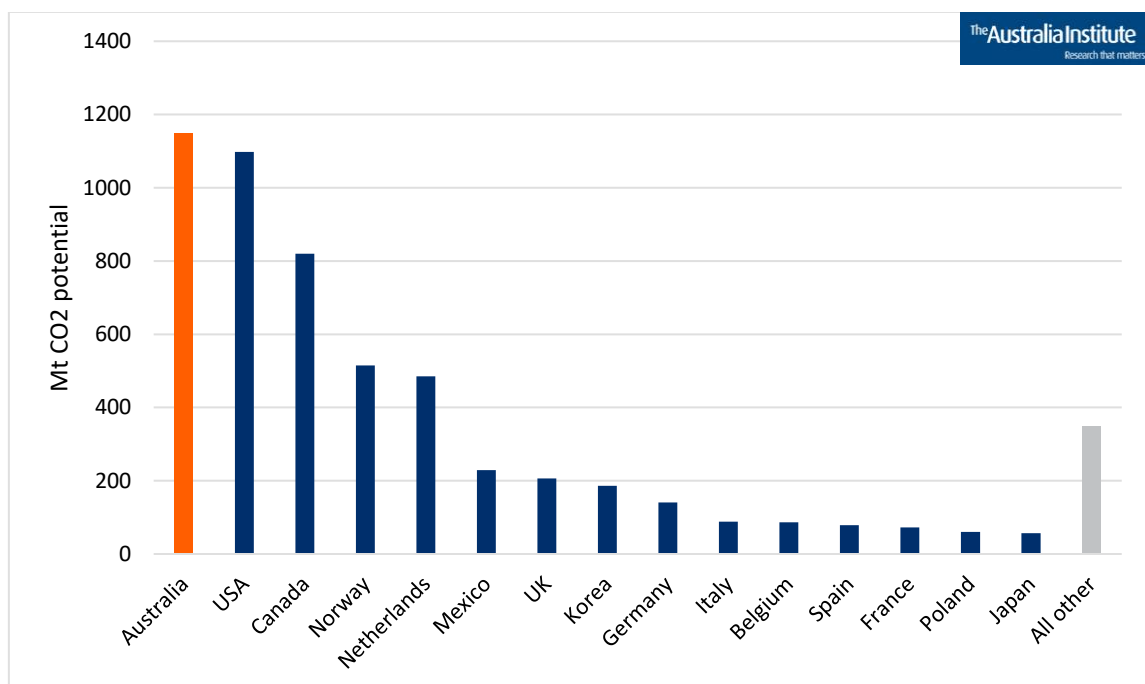
## IN THE OECD

Australia is the biggest fossil fuel exporter in the OECD, just ahead of the USA.

Australia's fossil fuel exports make up 20% of OECD exports.

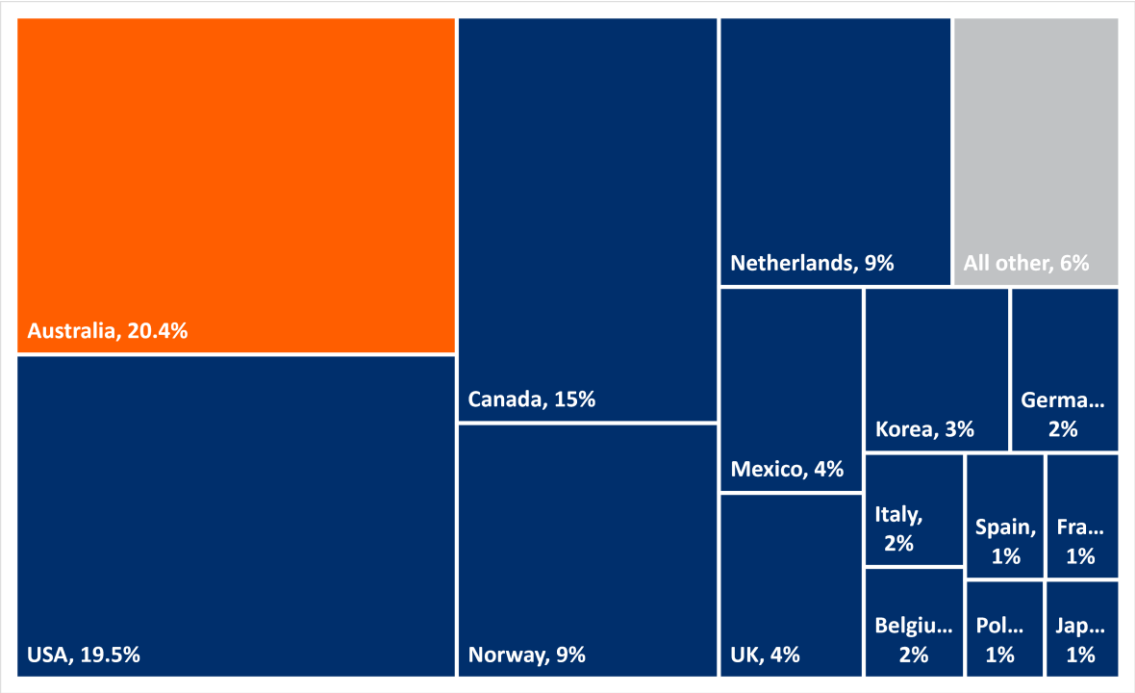
In per capita terms, Australia is the second biggest producer and exporter of fossil fuels in the OECD. The US is the twelfth largest exporter per capita, and the fourth largest producer per capita. Norway is the largest, due to nearly all its substantial oil production being exported, and its small population.

**Figure 19: OECD fossil fuel exports (Mt CO2 potential)**



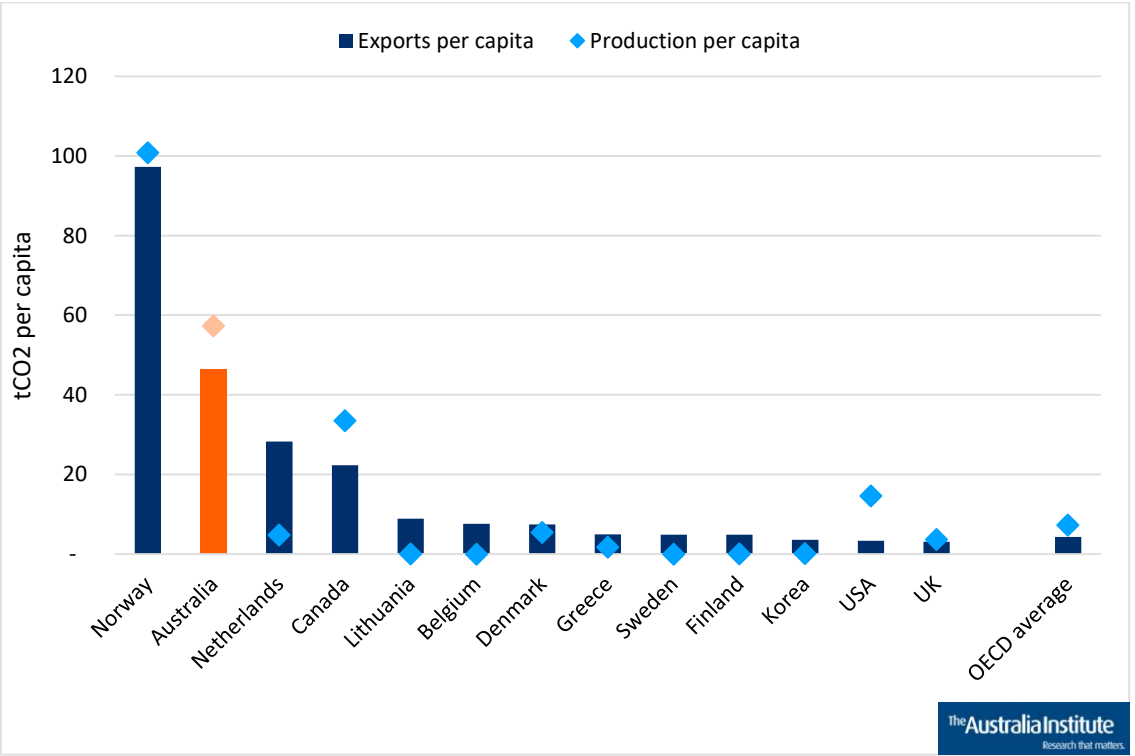
Source: IEA (2019) *World energy balances*; IPCC (2006) *IPCC Guidelines*

Figure 20: OECD fossil fuel exports, share of total



Source: IEA (2019) *World energy balances*, IPCC (2006) *Guidelines*, as described in text

Figure 21: OECD fossil fuel exports, share of total



Source: IEA (2019) *World energy balances*; IPCC (2006) *IPCC Guidelines*; IMF (2019) *IMFDataMapper*, as described in text

## IN THE G20

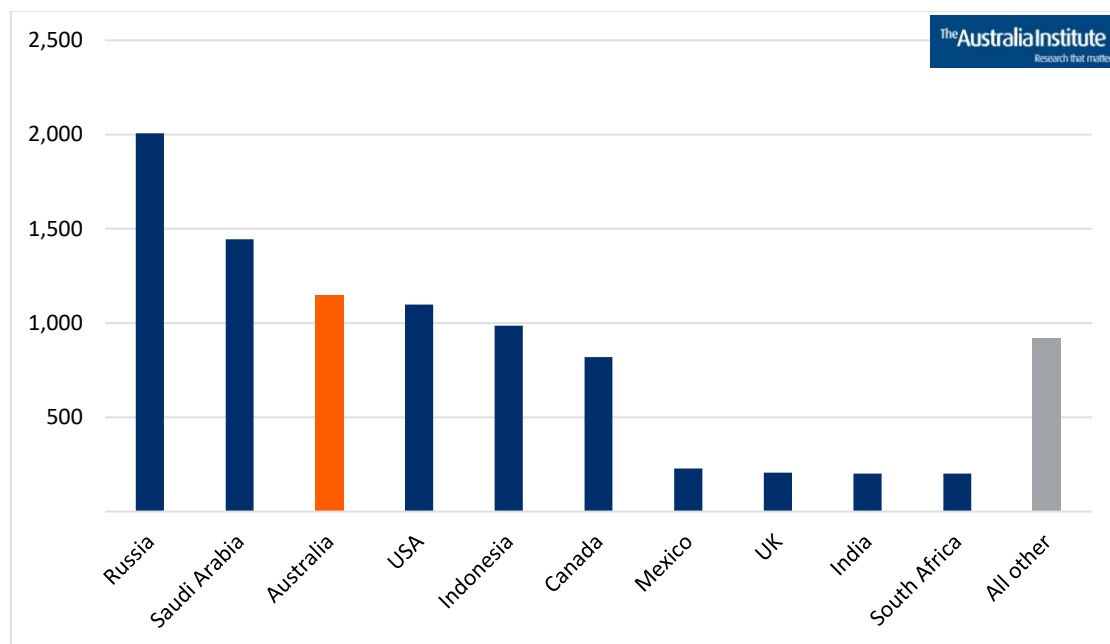
The Group of 20 (G20) includes the governments of nineteen countries, which together make up around 85% all of world economic activity (measured by GDP) and two thirds of the world's population.<sup>21</sup> (Note it also includes the EU – here excluded.)

Australia makes up 12% of G20 fossil fuel exports.

The G20 includes the largest exporters, but leaves out many smaller countries with substantial exports. As a result, Australia's fossil fuel production and exports are a bigger share of the G20 than they are of the global total.

Australia ranks third in the G20, the same place it ranks in the world overall. G20 members Russia and Saudi Arabia are larger exporters than Australia.

**Figure 22: G20 country fossil fuel exports – Mt CO<sub>2</sub> potential**



Source: IEA (2019) *World energy balances*, IPCC (2006) *Guidelines*, as described in text

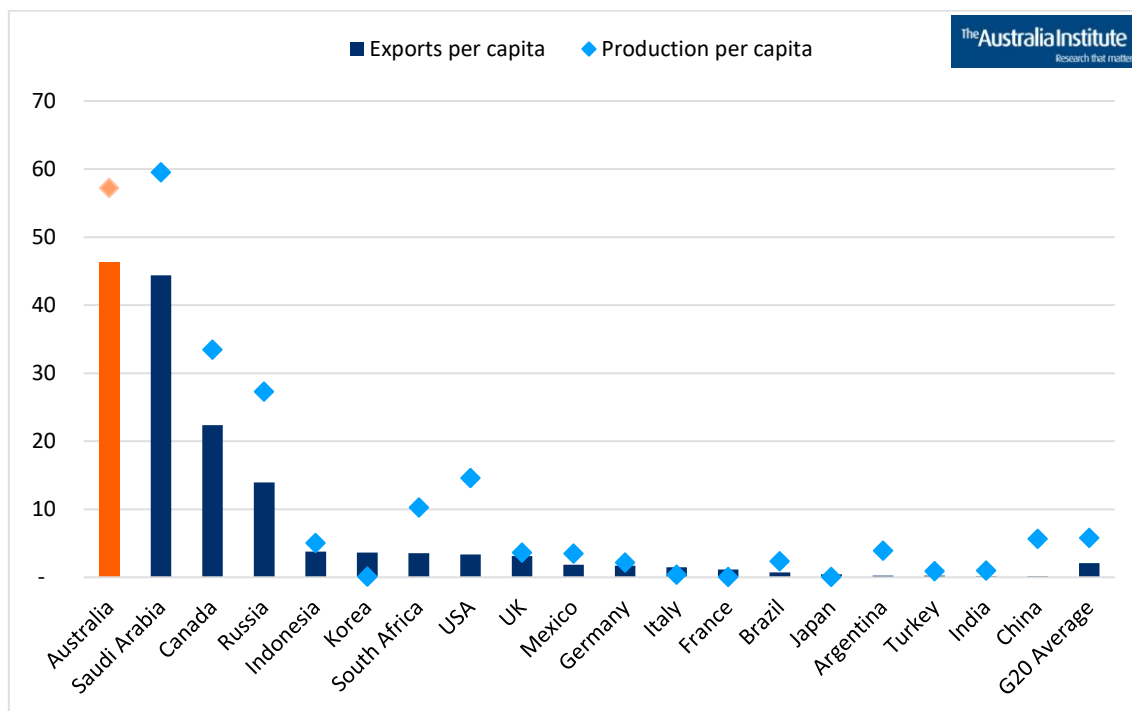
In terms of fossil fuel production in the G20, Australia makes up 5% of G20 fossil fuel production. It comes in at fifth place, as it does globally.

In per capita terms, Australia is the largest exporter of fossil fuels in the G20, just ahead of Saudi Arabia, and the second largest producer of fossil fuels, just behind Saudi Arabia.

<sup>21</sup> DFAT (2019) *The G20*, <https://dfat.gov.au/trade/organisations/g20/Pages/g20.aspx>



**Figure 23: G20 country fossil fuel exports – Mt CO2 potential per capita**

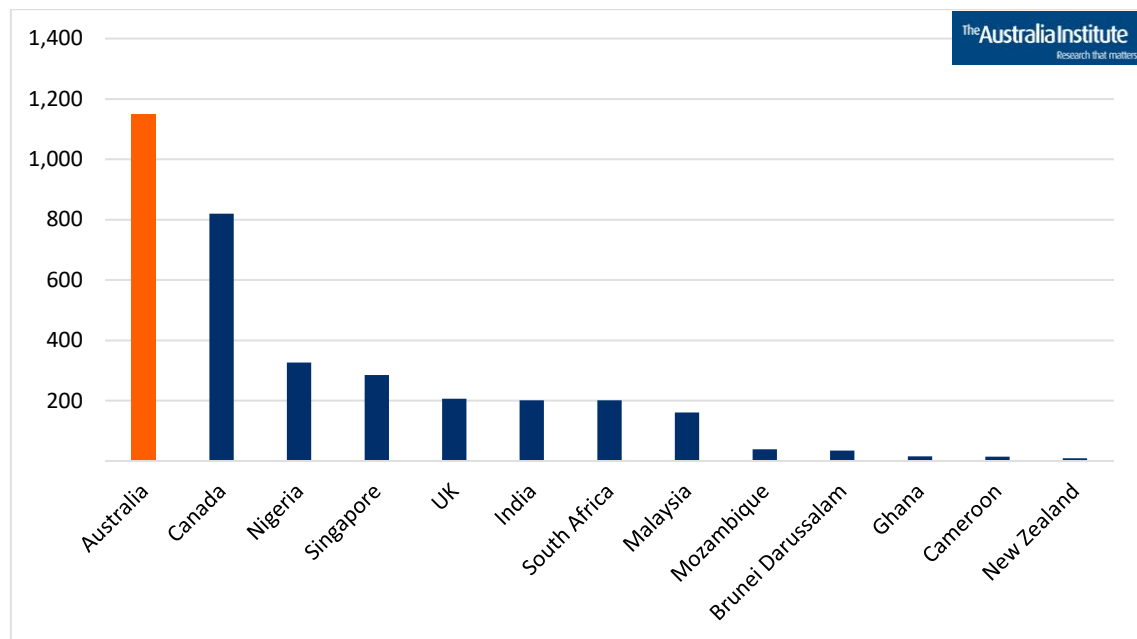


Source: IEA (2019) *World energy balances*; IPCC (2006) *IPCC Guidelines*; IMF (2019) *IMFDataMapper*, as described in text

## IN THE COMMONWEALTH

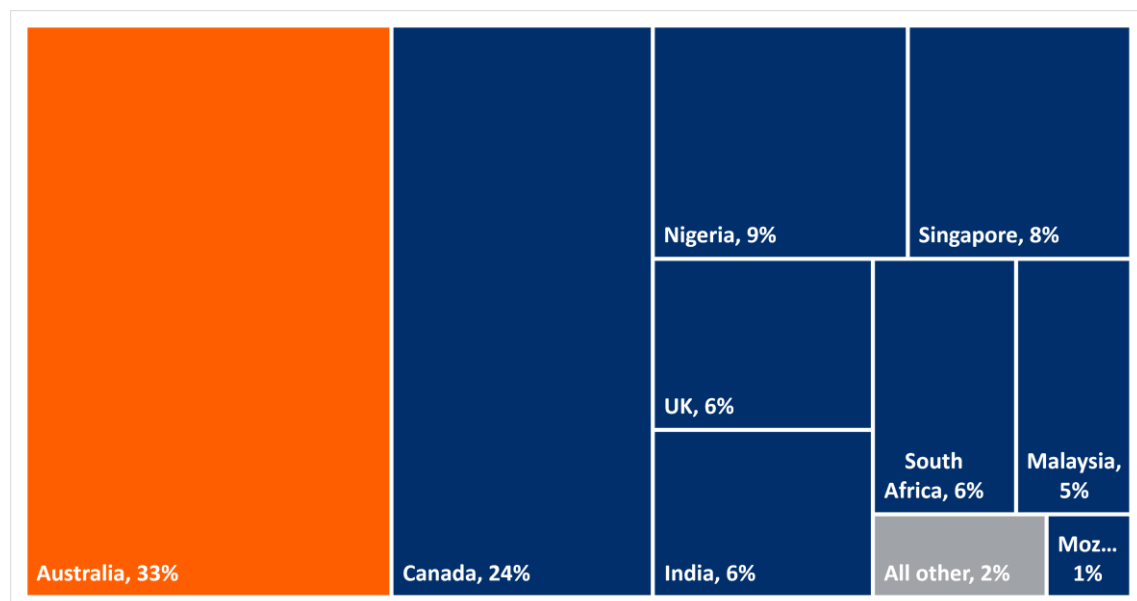
Australia is the biggest fossil fuel producer and exporter in the Commonwealth of Nations, responsible for 33% of Commonwealth fossil fuel exports. Australia is a bigger exporter than Canada.

**Figure 24: Commonwealth country fossil fuel exports – Mt CO2 potential**



Source: IEA (2019) *World energy balances*; IPCC (2006) *IPCC Guidelines*, as described in text

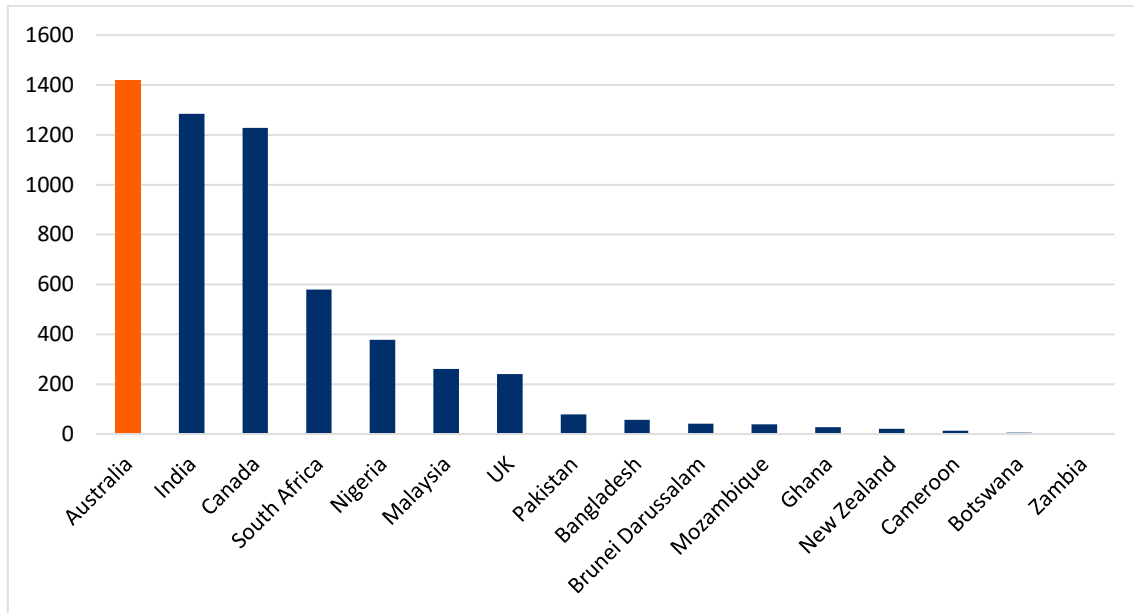
**Figure 25: Commonwealth country fossil fuel exports – share of Mt CO2 potential**



Source: IEA (2019) *World energy balances*; IPCC (2006) *IPCC Guidelines*; IMF (2019) *IMFDataMapper*, as described in text

Australia is also the largest producer of fossil fuels in the Commonwealth, producing 25%, more than India (23%) or Canada (22%).

**Figure 26: Commonwealth country fossil fuel production – Mt CO<sub>2</sub> potential**

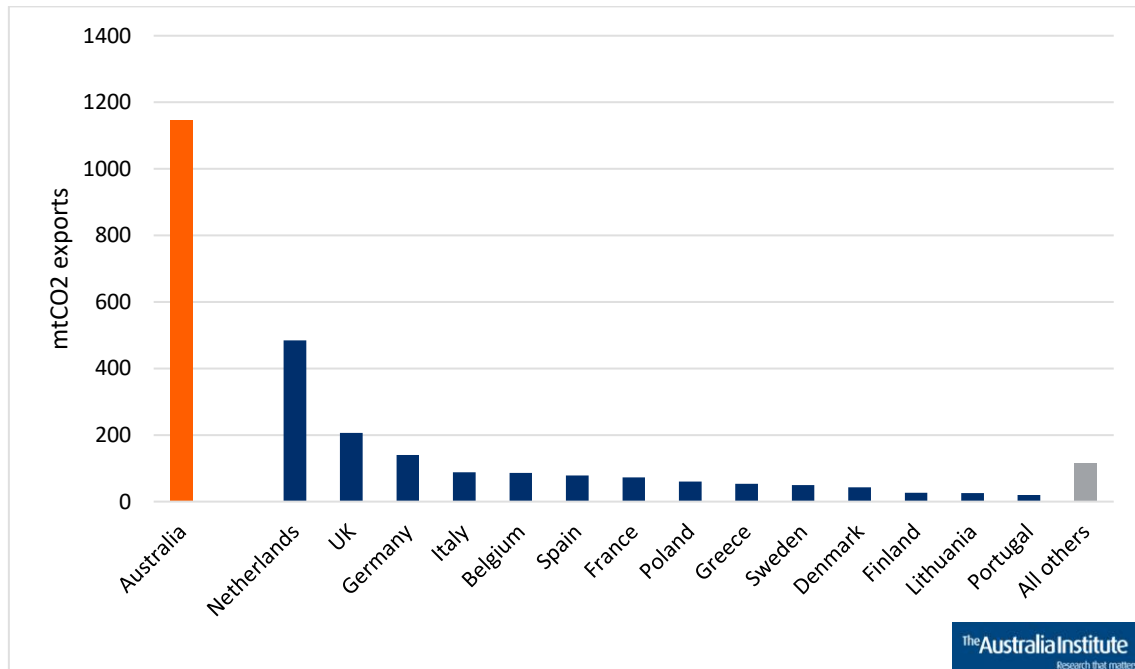


Source: IEA (2019) *World energy balances*; IPCC (2006) *IPCC Guidelines*, as described in text

## VS EU

Australia fossil fuel exports are more than double any country in the European Union.<sup>22</sup>

**Figure 27: Australia vs EU country fossil fuel exports – Mt CO2 potential**



Source: IEA (2019) *World energy balances*; IPCC (2006) *IPCC Guidelines*, as described in text

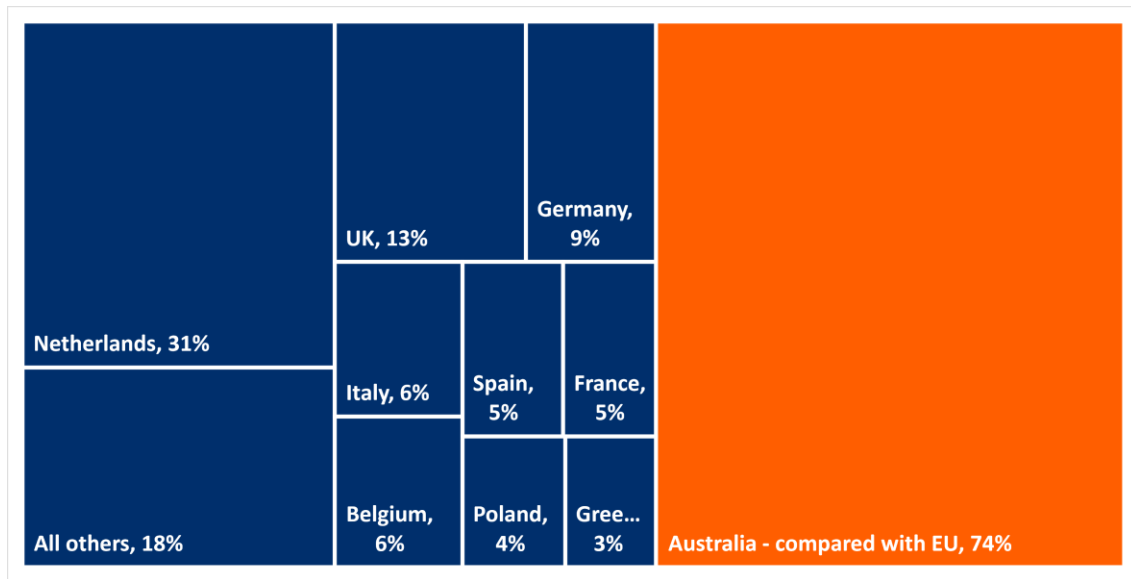
Australia's fossil fuel CO2 exports are 2.4 times bigger than the Netherlands', 5.6 times bigger than Germany's, and 8.2 times bigger than Germany's.

Australia's fossil fuel exports contain CO2 potential of 74% of the fossil fuel exports of the entire EU.

The EU has a population more than 20 times bigger than Australia and a combined GDP 13 times bigger than Australia's. Yet EU countries export only 1.35 times as much CO2 as Australia.

<sup>22</sup> These figures include exports between countries within EU; they are not restricted to EU country exports out of the EU.

**Figure 28: Australia vs EU country fossil fuel exports – Mt CO2 potential**

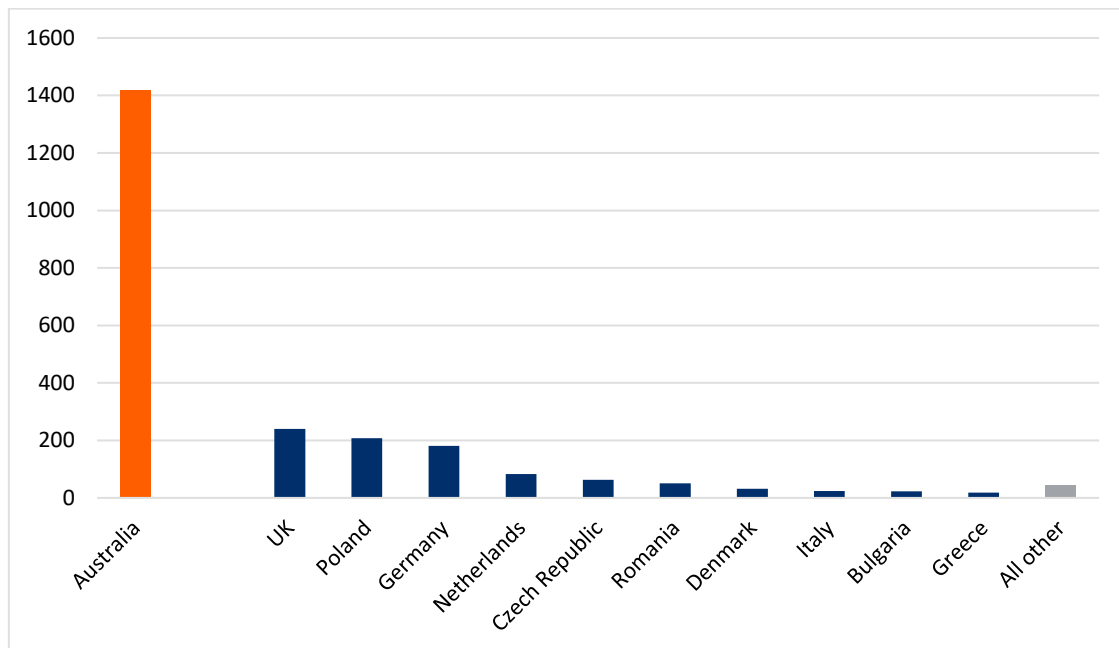


Source: IEA (2019) *World energy balances*; IPCC (2006) *IPCC Guidelines*, as described in text

The reason for this is that EU countries are not major fossil fuel producers, importing most of their consumption.

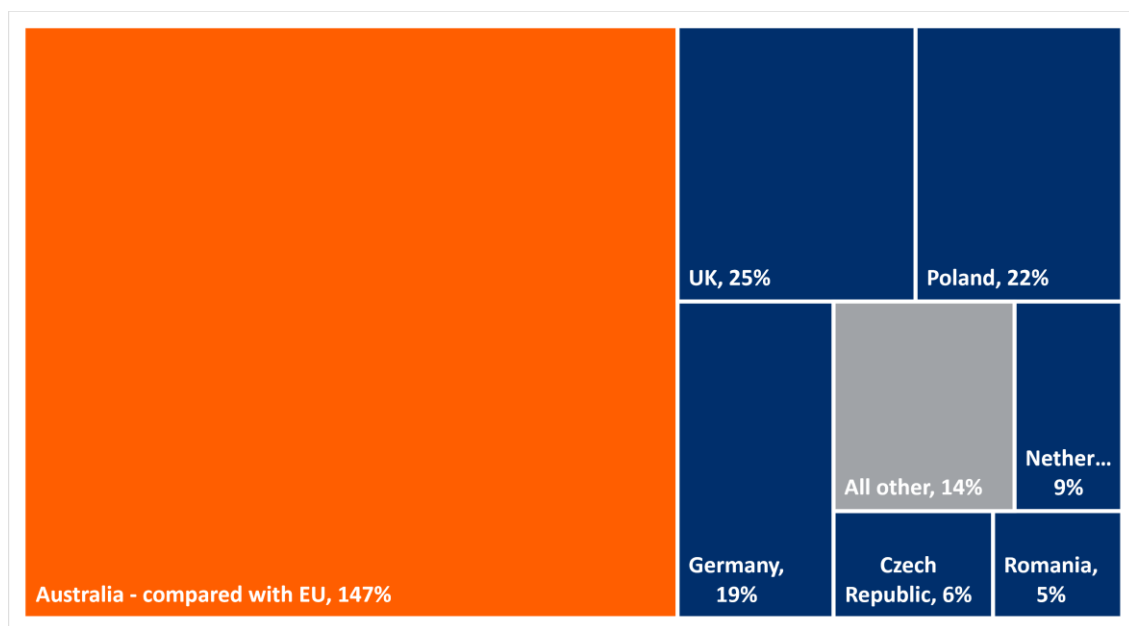
By production, the contrast is even greater. One and a half times as much fossil fuels, by CO2 potential, are mined in Australia as are mined in all the EU put together. Even countries like Poland and Germany, with substantial coal power sectors and high-profile debates about transition, mine far smaller volumes of fossil fuels.

**Figure 29: Australia vs EU country fossil fuel production - Mt CO2 potential**



Source: IEA (2019) *World energy balances*; IPCC (2006) *IPCC Guidelines*, as described in text

**Figure 30: Australia vs EU country fossil fuel production – share of Mt CO2 potential**



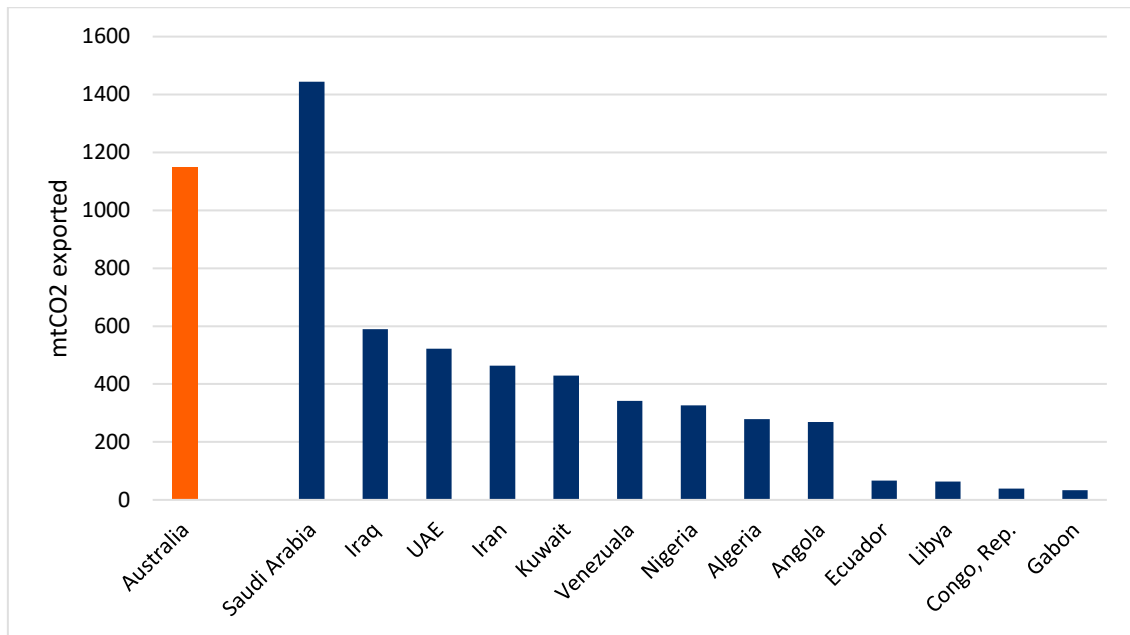
Source: IEA (2019) *World energy balances*; IPCC (2006) *IPCC Guidelines*, as described in text

EU countries are bigger exporters than they are producers, because many EU countries import crude, refine it and export it, especially to other EU countries. Around two thirds of EU country fossil fuel exports (by CO2 potential) are refined oil products. A third of the EU's refined oil exports come out of the Netherlands.

## VS OPEC

If Australia was in OPEC, it would have the second biggest carbon exports, behind only Saudi Arabia. Australia's CO<sub>2</sub> exports are twice as big as Iraq's, the second biggest OPEC exporter.

**Figure 31: Australia vs OPEC country fossil fuel exports – Mt CO<sub>2</sub> potential**

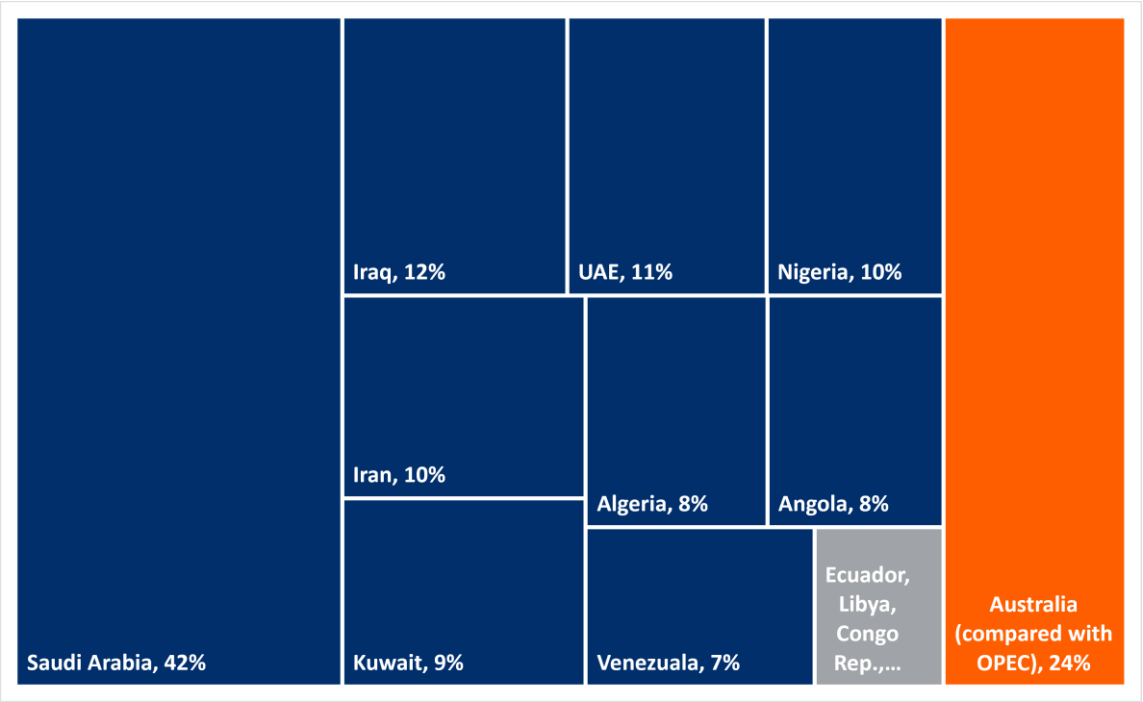


Source: IEA (2019) *World energy balances*; IPCC (2006) *IPCC Guidelines*, as described in text

Australia's carbon exports are 24% of the carbon exports from the 13 OPEC countries.<sup>23</sup>

<sup>23</sup> NB: Equatorial Guinea is also an OPEC country with small exports by comparison to most OPEC countries. It is excluded as its IEA data is unavailable.

Figure 32: Australia vs OPEC country fossil fuel exports – share of Mt CO2 potential



Source: IEA (2019) *World energy balances*; IPCC (2006) *IPCC Guidelines*, as described in text



# Why exports matter

For decades, climate policymakers have focused on reducing emissions within individual countries. Under UN emissions accounting, countries are responsible only for emissions from within their territory. Fossil fuels they mine and export are irrelevant.

This misses half the picture. Climate policy should cut with ‘both arms of the scissors’, addressing both fossil fuel demand *and supply*.<sup>24</sup>

Basic principles of economics suggest that increasing supply of a good puts downwards pressure on the price of that good. By increasing the supply of coal, coal power becomes cheaper. This encourages increased coal consumption in both the short-term (increased generation) and in the longer term (new coal assets or delayed retirement) over other energy sources that do not cause the same harms.

Conversely, efforts to reduce consumption of fossil fuels lower prices, encouraging consumption in other markets. This can cause rebound effects that increase emissions elsewhere, as well as a ‘green paradox’ where resource owners race to exploit resources ahead of constraints on demand.

Stopping new supply puts upwards pressure on prices. It therefore secures revenue and employment in existing operations, while allowing sensible planning for the end of existing operations.

Building new high carbon assets ‘locks in’ emissions, allowing their operation at marginal costs lower than required to justify construction. Stopping new supply infrastructure stops lock-in, prevents stranded assets and redirects capital to low carbon alternatives.

Implementing and administering supply side policy costs relatively little. It is easy to stop new coalmines and to tell whether a country is building new ones.

Supply policy is easy to understand and mobilise support around. It can mobilise support both from those who would be impacted by new projects, and the owners of existing fossil fuel assets, who stand benefit from higher prices.

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<sup>24</sup> This section summarises arguments in Green and Denniss (2018) *Cutting with both arms of the scissors: the economic and political case for restrictive supply-side climate policies*, <https://link.springer.com/content/pdf/10.1007%2Fs10584-018-2162-x.pdf>

Some countries and subnational jurisdictions have announced moratoria on new coal or oil production, including China and the US (both temporary and elapsed), France, New Zealand and Myanmar. There are moratoria on unconventional gas in many states of the USA and Australia.

Yet such supply side climate policy remains largely alien to official climate policy.

Words like ‘coal’ and ‘oil’ and ‘fossil fuels’ do not appear in the Paris Agreement nor in any previous treaties. There is no provision under the Paris Agreement for including supply side policies as part of Nationally Determined Contributions or ‘Paris pledges’. Indeed, there is no authoritative data set on the emissions from internationally traded fossil fuels.

On the economics of fossil fuels, official climate policy-making misses half the story – and for Australia, most of it.

## **MORE EXPORTS PUSH EMISSIONS DOWN?**

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Fossil fuel companies and most Australian politicians generally try to avoid talking about the climate implications of Australia’s exports. Pressed on the issue they have traditionally claimed either that the exports make no difference to world emissions or that they are not Australia’s responsibility.

Recently, many have changed approach. For example, the Minister for Energy and Emission Reduction welcomed rising domestic emissions from LNG exports because the gas will help countries transition away from coal.

The Australian government is now accepting the basic principle that what Australia does and does not export has an impact on world emissions. But this acceptance is selective and dubious.

Neither the government nor the gas industry have provided clear evidence as to whether and to what extent LNG is in fact displacing coal, rather than displacing other LNG producers, or renewables, or increasing overall energy consumption.

Moreover, Australian governments continue to reject responsibility for the vast scale of Australia’s exported emissions. Those arguing that LNG displaces coal have not supported a moratorium on new coal mines.

# Conclusion

Australian government ministers argue Australia's emissions are small on a global scale. They use this as an excuse for delaying effective action on climate. But on any reasonable assessment of domestic emissions alone, Australia is a large emitter and Australia's emissions are rising, not falling.

Australia is in the top 10% of global emitters, and our emissions are climbing. Australia's domestic emissions are larger than forty other countries that have larger populations.

However, Australia's role in fuelling the climate crisis is far greater than even its large and rising domestic emissions would suggest.

Australia's fossil fuel industries already make it the third largest fossil fuel exporter in the world, and it plans to increase its coal and gas exports.

The Australian Parliament ratified the Paris Agreement less than a year after it was signed (a record speed for Australia's Parliament)<sup>25</sup> and the Agreement continues to have the support of most Australians.<sup>26</sup> The Paris Agreement's global goal requires countries to increase ambition over time to achieve large emissions cuts in the next decade and reach net zero emissions by mid-century. The Agreement calls on developed countries like Australia to lead the way. And Australia is well positioned to do so.

Australia's economy is far more diversified and less dominated by fossil fuels than many other major exporting countries.

Australia has the opportunity, and obligation, to face up to the climate crisis through policies to limit its carbon exports, starting with a moratorium on new coal mines.

Those in the global community making efforts to confront the climate crisis must understand the scale of Australia's fossil fuel existing exports and policies to increase Australia's fossil fuel exports even further.

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<sup>25</sup> Foreign Minister Julie Bishop (2016) *Media Release – Paris Agreement Ratification*, [https://foreignminister.gov.au/releases/Pages/2016/jb\\_mr\\_161110a.aspx?w=tb1CaGpkPX%2FISOK%2Bg9ZKEg%3D%3D](https://foreignminister.gov.au/releases/Pages/2016/jb_mr_161110a.aspx?w=tb1CaGpkPX%2FISOK%2Bg9ZKEg%3D%3D)

<sup>26</sup> Bennett (2018) *Climate of the Nation Report 2018*, <http://www.tai.org.au/content/climate-nation-2018>