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Residential | Commercial | Industrial

20 September 2017.

Hydraulic Fracturing Taskforce
GPO Box 4396
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Dear Taskforce

My name is Bruce Holland, and I am the CEO of Elengas, which is an electricity and gas brokering service, primarily operating in South Australia.
I am writing to you in regard to the potential economic impacts which may manifest around an economic oil and or gas development in the NT.

1 Background

Prior to founding Elengas some 17 years ago, I had previously been employed in the oil & gas business, as well as the electricity generation/ retail industries.

I am commercially qualified, B Comm. (Econ) UNSW., have a Diploma of Management (AGSM - UNSW) and I am a graduate of the Australian Institute of Company Directors ("AICD"), and a Fellow of the Australian Institute of Energy (FAIE).

I am also Secretary and a founding member of The Norwood Resource ("TNR") which has a mission to get the facts about the impact of oil & gas exploration and production on the environment out into the public space. More about The Norwood Resource can be accessed from the web site https://thenorwoodresource.org.au/

I am not writing to you as a representative of TNR, as the content of this letter does not fit within TNR's mission. Rather, I am writing as an economist, who has worked in the electricity and the oil & gas industries for some 30 years.

2 NT Fracking inquiry – TNR submission

I have followed with interest the progress of your inquiry into fracking in the NT, and indeed, TNR has lodged a submission (dated 26 April 2017, submission #114) for your consideration. I endorse that submission, especially insofar as it encourages the Task Force to base its findings on evidenced based facts rather than misinformation, fiction, myths, scary stories and hearsay.

3 Economic Commentary

The motivation to write to you is I have noted that some of the presentations to you from 'expert economic" presenters professing knowledge in the economics of gas supply have made some extraordinary claims and assertions, and in my view, have made some erroneous broad sweeping statements in regard to the costs and the potential benefits which may flow to the NT economy from a gas development, be it unconventional or conventional or small or large.

Observing some of the presentations on potential economic benefits, it would appear the presenters advocate the 'do nothing' case rather than investigating more fully the potential economic benefits which may flow to local communities and the Territory wide economy. There was certainly nothing positive in their presentations which

would support any (or at most minimal) economic benefit of a potential development, and indeed, one presenter seemingly suggesting the cancellation of the construction of the NT gas pipeline to Mt Isa!

The specific presentations I refer to are;
The Australian Institute – Mr Rod Campbell, and
The Institute for Energy Economics and Financial Analysis – Mr Bruce Robertson.

Their observations, and negative outlook of the economic benefits for a potential development seem to be coordinated and ideologically driven rather than based on logic or fact.

4 Economic Benefits

In regard to the actual oil & gas development in other jurisdictions, there actually has been an economic benefit!

For example, on a local scale, the benefits which have accrued to the local community (principally Alice Springs) from Central Petroleum operations (see http://centralpetroleum.com.au/wp-content/uploads/2017/09/Centralian-Advocate-Embracing-the-Local-Spirit.pdf) where the investment by Central Petroleum of employing locals and training locals rather than continue with a fly in / fly out workforce, as well as sourcing supplies locally, (for example, a recent purchase of six vehicles from an Alice Springs business rather than from Adelaide) has delivered an estimated benefit to the local community in excess of $3.5m.

Also in the NT, the offshore gas fields supplying gas to the ConocoPhillips Australia LNG facility at Wickham Point and now the huge INPEX investment in the development of the offshore Ichthys field bringing gas onshore at its LNG processing plant at Blaydin Point (near Darwin) have been and will continue to be huge economic contributors to the NT economy. These developments have and will continue to use locally based personnel for direct and indirect roles, as well as sourcing many millions of dollars from local service companies, be they contract trades through to roads and facilities maintenance etc.

Another significant example is Moomba in SA, which I understand the panel has visited as well as having close experiences with frack fluid and the fracking operations in the Moomba area. The two presenters omitted to mention the vast economic benefits from the Moomba oil and gas fields, where fracking has been carried out for 40 years or more, all without any significant environmental impact.

Indeed, one would have to be pretty blind to miss tripping over the economic benefits from the Moomba oil & gas development. It is remote, but there have been billions of dollars spent on the plant, outlying satellites and field development, infrastructure (roads, airport facilities, water supply, accommodation etc) such that it is also a tourist attraction for those who like to travel well off the beaten track.

The Moomba development has provided jobs for hundreds of direct employees and probably thousands of indirect employees, sourced billions of dollars from local and Australian suppliers and provided the South Australian Government with many millions of dollars in royalties. It has also provided the foundation for many associated industries and hence indirect jobs and services as well.

The Moomba development from the early 70's onward has with the construction of the Moomba/ Sydney pipeline, and the Moomba/ Adelaide pipelines been an economic power for the east coast, providing gas to hundreds if not thousands of business, from fertiliser manufacture, plastics manufacture, to glass manufacture and cement making such that it is estimated over 300,000 employees along the east coast depend on the reliable supply of gas.

Further, for home heating and space heating, and hot water systems, gas provides millions of people on the east coast areas a safe, reliable convenient source of energy to power their homes, and in SA, gas has the highest penetration of gas for electricity supply of any State in the NEM. Of course, the economic benefits to the wider

community include royalties to the SA Govt which is able to fund its programmes, such as roads and hospitals and so on, at the same time reducing the tax burden on the State's population compared to achieving the same SA Govt spending programmes without a Moomba development.

Similar comments could be made about other remote developments, such as Jackson in South West Queensland, which has similar infrastructure to Moomba. Also on a much smaller scale (but also remote) is the Kenmore/Bodalla oil field in Queensland, which also has infrastructure, roads constructed etc. with royalties being paid to the Queensland Government.

Also, in Queensland is the hive of economic activity which commenced some 5 to 6 years ago around the Chinchilla and Roma areas for field development to support the huge CSG / LNG projects. Despite the construction of most of the field development ending, and some significant drops in local house prices and rents (as the work force reduced) the regional net economic benefit was enormous, compared to the 'do nothing' case advocated by the 'expert economists' presenters to your inquiry.

Whilst not purely economic, GISERA has conducted a number of 'Wellbeing research studies' of the Chinchilla area, and I commend the work that GISERA has undertaken over the years as to the impact (economic, social and wellbeing etc) the 'unconventional' oil & gas industry has had on this area.

Indeed, staying in Queensland, some ingenious tourist operators actually 'cash in' on the industry, such as 'The Big Rig' in Roma, which has generated an ongoing stream of tourists who then go on to visit other attractions in the local area. The other side benefit is that tourists can be better educated in actual practices in the industry by being able to have a unique first-hand experience on a drill rig floor. https://www.bigrigroma.com

In Western Australia, the economic benefits have been enormous, as they have been in Victoria, being offshore Bass Strait and the Otway basin's gas development. The Otway Basin is now one of the major gas sources for South Australia.

In Victoria, the offshore developments of Bass Strait have delivered huge economic benefits particularly in Australia's formative years of industrial growth in the Victorian economy. "Between 1967 and 2015 the Gippsland Basin Joint Venture (Esso / BHP) paid more than $89 billion in Australian excises, royalties and taxes (over $200 billion in 2016 terms)", and "Improved the real incomes (or economic welfare) of Australian residents by more than $640 billion (or $13.1 billion per year) or $780 per person per year" (Reference, ACIL ALLEN 'About the Gippsland Basin Joint Venture' (attached)).

Gas exports from Australia is now one of Australia's major export earners, and will continue to increase. Australian LNG export revenue reached a quarterly record of $6,463m in Quarter 2 (2017), up 88% quarter on quarter (source EnergyQuest Energy Quarterly Report September 2017).

It is difficult to not see the huge economic impact that gas has had in the local areas and the financial prosperity of Australia, but it seems the two 'economic presenters' were able to manage this.

5 Gas Royalties to the NT Govt.

One of the 'economic' presenters also made the point that the resource industry in the NT does not pay very much in royalties to the NT Government (stating a figure of $170m/a) and proceeded to say this was only 2 to 3 percent of the total revenue ($6b/a) to the NT Govt., also saying any increase emanating from royalties from a gas development in the NT would be 'tiny', a term he used numerous time to diminish any impact of a substantial increase in royalties from a gas development.

However, a more realistic comparison is to exclude the money provided by the Federal Government ($4b), which is a more pertinent comparison. Revenue raised by the NT from its own sources last financial year was $1.9b, and so the $170m is a contribution of around 9%

So, any significant increase in royalties (such as doubling this number) is certainly not 'tiny' but substantial!

6 Employment, direct and indirect

The claim that the oil & gas (extraction) industry does not have many direct employees, does not account for the associated and indirect benefits to communities and Governments etc. Direct employment is listed (oil and gas extractive industry) as being approx. 19.1 k employees for 2015/16 period on the ABS site. Bearing in mind this is the 'extractive' component of the industry and does not give the full picture of the benefits from a healthy and vibrant gas exploration and production industry, for example on the same ABS page (2016-16 Key Mining Industry Figures) the ABS also lists the 'sales and service income' for the 'Oil and gas extraction' business for the same period was $34.6b, and an EBITDA of $17.0b for the same period. (See attached extract from the ABS.) It may be a relatively low 'direct' employer industry, but a very strong revenue generator, of which the respective Governments and local communities benefit.

It should also be noted that the ABS categories are only listing the direct employees in the 'extractive' portion of the industry (excluding the downstream portion of the industry), whereas there are many indirect employment jobs and services that would not be undertaken save for a gas development project. For example, a chef on duty in the kitchens at Moomba is not classified as an oil & gas worker, rather as a hospitality employee. Similar, for the pilot and aircrew who flies the Moomba workers from Adelaide to Moomba (and back again) as his fulltime job (and may not be employed save for the Moomba project) is classed as being in the airline industry, and so on for many different 'support workers', ranging from lawyers, accountants to road maintenance etc.

So, the argument that the oil & gas industry is a low employer can be deceiving and is commonly used (seemingly deliberately) by anti-fossil fuel advocates, and their ilk to help tarnish the good corporate citizen name of the industry and demonise the industry.

I also noted that that one of the presenters was at pains to express (his opinion only) that there was virtually nil localised benefit to people (or communities) from a local gas development (such as road building), almost portraying a picture that there is little (if anything) through indirect employment benefits from a gas development, but he had to concede following questions from the Panel, that indirect jobs from a gas development can be both overstated and understated.

One does not have to look too far for evidence of indirect employment as outlined above. Indeed, one of the presenters to your Inquiry has described to you how he had to lay off around 12 personnel (as well as himself) following the announcement of a moratorium on fracking in the NT. (See Oilfield Connect P/L submissions, #174, #222, #293, #318, #339). So, a dozen people working in a machine shop producing pipe sections for the oil and gas industry were indirect employees of the industry. This is just a small example and makes a mockery of the so called 'economic presenters' assertion that there are virtually nil indirect employment opportunities.

7 East Coast Gas supply / Demand balance

The argument that there is 'oodles' of gas in Australia and the East Coast doesn't have a gas supply limited situation is shallow and facile. Quite frankly, if there was sufficient gas, Prime Minister (Malcom Turnbull) and the Opposition leader would not be involved in debates and strategies as to how to get more gas into the east coast domestic gas market, to help bring gas shortages under control and to bring the east coast gas price down.

There may be 'oodles' of gas (as one of your presenters stated) but he didn't say it was in the ground, and there are limits to how much one well can deliver at any one time. This is known as "deliverability" and is of paramount importance in the gas supply industry, since you can have many Trillions of cubic feet "Tcf" in the ground but still not be able to meet the market due to low deliverability.

This is an issue with all gas fields, in that as wells commence production, they decline in deliverability with gas being produced the reservoir pressure declines and then the deliverability reduces accordingly, and so more fields and wells have to be drilled (and / or fracked) and connected to increase the flow to meet the required market demand particularly for periods of peak demand.

As such we have a supply shortfall in total on the east coast, since the current gas available on the east coast is not meeting all of the demand (both domestic and export) in total. Indeed, there has been 'demand destruction' in the total NSW market over the last few years. That is, there has not been sufficient supply to meet the demand and so the demand has gone elsewhere (replaced by electricity or withdrawn from the market).

The assertion that increased gas supplies to the east coast will not have a material impact on prices, is basically flawed and plainly wrong, and this is evidenced by increased gas being made available recently for the east coast market (by Santos and Shell) and as a result, gas prices have fallen, such that Engie has entered into a supply arrangement with both Santos and Shell for the operation of the Pelican Point power station (approx. 480MW), the impact of which should have a downward impact on South Australia's electricity prices.

8 East Coast gas prices Vs Australian Gas priced in overseas markets.

One presenter also raised the comparison of Australian gas prices to those in Japan (which imports Australian LNG). A warning here, for a direct comparison, prices must be compared on a like for like basis, that is 'apples to apples' basis. The sort of comparison used in the presentation to the Panel (wholesale prices) may not be an 'apples to apples' comparison, since the comparison generally is a 'wholesale price' in Japan compared to delivered gas prices reportedly (in the press) offered to industrial customers on the east coast of Australia.

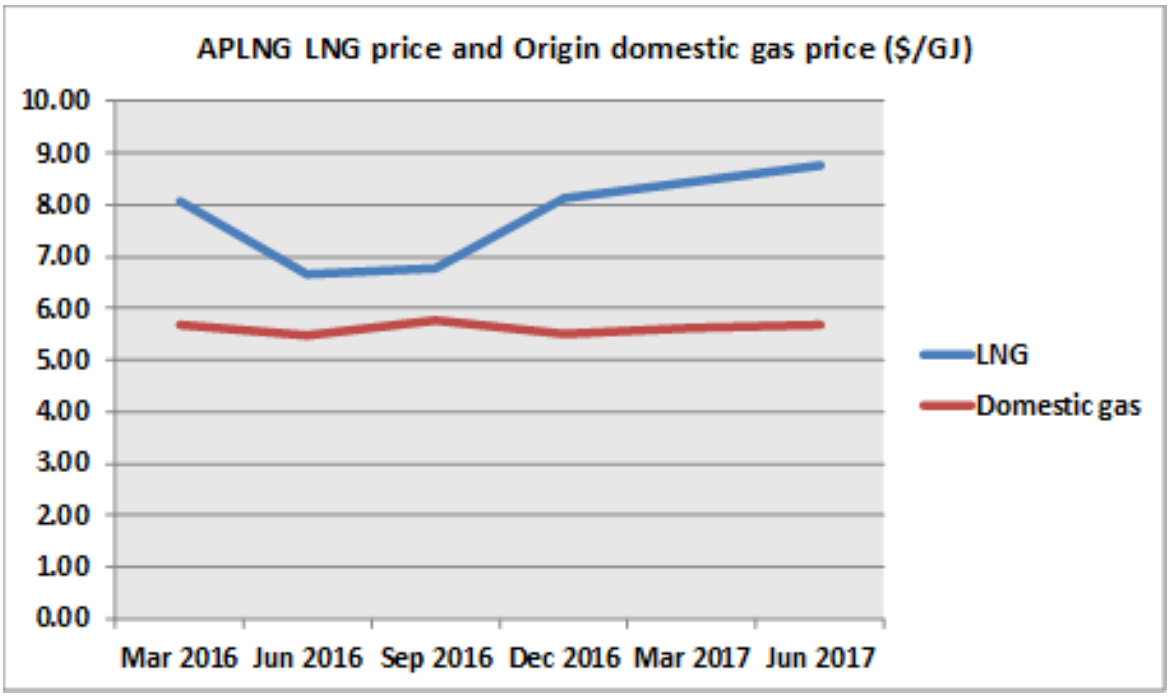
Generally, these comparisons of price are not a true 'apples to apples' comparison, since landed prices in Japan are not relevant to delivered prices offered to industrial users in the east coast of Australia, as the delivered east coast prices also have distribution / network costs and perhaps some other retailer mark ups of the delivered price etc . Strangely in these comparisons from anti fossil fuel activists they don't mention the delivered price for gas in Japan, which then could be used as an 'apples to apples' comparison.

It is interesting to note however, one of the presenters has been making this loose assertion (that Australian gas is cheaper in Japan than in Australia) for around the last 12 months, when in fact the opposite is the case.

The following points are from the EneryQuarterly September 2017 report provided by EnergyQuest.

- **Average domestic gas prices continue to be around $3/GJ lower than export prices**, on both west and east coasts (Figure 43). On the west coast the average NWS LNG price was $8.31/GJ, $3.23/GJ above the average domestic price of $5.08/GJ. Santos's average LNG price was $9.19/GJ, $3.07/GJ above its average domestic price of $6.12/GJ. Origin's average LNG price of $8.77/GJ was $3.09/GJ above its average domestic gas price of $5.68/GJ.
- In Q2 the short-term east coast gas prices netted back to Wallumbilla ranged between $0.26/GJ and $1.77/GJ below the LNG netback at Wallumbilla. This suggests that on a comparable basis, Australian short-term gas prices are below prices being paid by the Japanese, although not necessarily by much

Figure 44 APLNG LNG price and Origin domestic gas price ($/GJ)



Source: Origin Energy

- Reference –EnergyQuarterly September 2017. EnergyQuest

The above points and graphical representation of the domestic and export prices effectively destroys the baseless assertion that Australian gas is more expensive in Australian than in Japan!

9 Economics of NT Gas Development

It is also interesting to hear the presenters state emphatically that NT onshore gas developments (which Santos, Origin and Pangea may have in their plans) are sub economic, stating categorically that the 'wellhead' price is $7.50/GJ. Interestingly they both used this same number and cost point ('wellhead cost') of assessing the cost! One wonders where they dreamt up such a number.

Normally a gas price (cost) would be at the point of sale being 'ex plant', and certainly not 'ex wellhead'. This is primarily due to the composition of the raw gas from field to field (and perhaps well to well if different reservoir zones are produced) is likely to be different, and all gas requires processing through separators, dehydration, Co2 removal (if required) etc prior to having 'sale gas' composition ready for dispatch ex plant, which is the **custody transfer point** if a buyer is purchasing at this point, or prior to going into a pipeline for transport to end markets.

So, to claim a price (or cost) at 'ex wellhead' is not a viable or realistic base for comparing prices (or costs) at all, and is a red herring demonstrating the presenters limited knowledge of gas field and market economics.
Further, it is interesting to note, that both so called economic presenters claimed the 'wellhead' price being $7.50/GJ, and yet neither offered any supporting evidence or references to substantiate such a price, except to say NT gas was 'high priced' gas, using this number and unsubstantiated assertion to claim that additional gas ex the NT would have no impact on the supply / demand or price situation of gas on the east coast.

Indeed, one of the presenters claimed that the new ($800m) Northern Gas Pipeline will only transport $20m of gas per annum, and was therefore uneconomic!

Based on his estimate of 'wellhead' cost of $7.5/GJ this equates to approximately 2.5PJ/a, whereas, as reported in the press, Incitec Pivot are foundation customers, contracted to use around a third of the 33PJ/a capacity, that is approximately 10 to 11 PJ/a, vastly more than the 2.5PJ/a stated by The Australian Institute representative.

The claim the 'wellhead' cost is $7.50/GJ is strange, insofar that as pointed out above, there was no substantiation of this price offered. The actual cost will depend on many factors, not the least being the size of the resource, the deliverability of each well, the cost of each well (with or without fracking) and infrastructure cost and so on. A small, low deliverability development may be high cost and therefore remain uneconomic in many circumstances. However, a large resource, with high deliverability wells which then enables an averaging down of well cost and fracking and infrastructure costs will have an ex plant cost considerably less than the throw away term of $7.50/GJ 'wellhead cost', perhaps down to $2 to $4 /GJ. (even less) ex plant. Much depends on the resource, composition, flow rates etc.

Certainly, the response to the panels question of 'if the NT gas is high priced and uneconomic, why then are Santos, Origin and Pangea all lining up to undertake exploration and perhaps development?' The responses were, 'perhaps strategic' (stop a competitor getting control of the resource (TAI)) which is pretty lame, given these companies each already have their exploration areas awarded to them. The other explanation was they are 'chasing a rabbit down a hole'! meaning they will throw good money after bad to shore up supply to their 'loss making' LNG plants at Gladstone!
Both of these responses are highly speculative and there was no evidence tendered by either presenters to substantiate these statements, and not once did they consider that their $7.50/GJ 'wellhead cost' might be totally overstated!

In regard to project economics, something I am familiar with, as I have been involved in numerous major projects, and 'Project Director' for some significant projects. Major projects developments for gas production (conventional or unconventional) will obviously depend upon the size, cost, market and relative ease of development of an identified resource and a number of other factors. However, it is also important to understand that major projects such as gas developments in remote areas are for the long term generally (10 to 20 years plus) and the project economics for development approval will review multiple price and cost possibilities, and even current prices may not be the decider when making a decision to go ahead with a project.

For example, In the case of 'The Liquids Project' which was an expansion of the Moomba gas plant and field to produce gas liquids (condensate) and crude oil in 1981/2 was an investment of $1.3 billion dollars in dollars of the day, that is, 1981 dollars. This project was for a long term period, and certainly not a short term (5 years or so), as the prices at the time were not conducive for such a huge investment for such a quick 'payback'. And so it is with many projects, that is, they are long term economic and financial decisions, such as the major development of the Beetaloo basin resource which may become a long term project subject to further exploration and fracking of course.

10 SA Inquiry and the USA experience

One other point I would like to make is that around 3 years ago the South Australian Parliament requested the South Australian Natural Resources Committee investigate unconventional gas (fracking) in the South East of South Australia. The major term of reference was potential impact on groundwater. The Committee found after 2 years of review, presentations (many from the same groups that have presented to your Panel) and further review etc that "… **the specific process of hydraulic fracturing or "fracking" in deep shale, properly managed and regulated, is unlikely to pose significant risks to groundwater**, …".
An aspect of that inquiry that is clearly apparent from the evidence of 4 of the 6 so-called economic experts (2 each from The Australia Institute and The Institute for Energy Economics and Financial Analysis) is their anti-fossil fuels bias, including their failure to objectively note the economic benefits of natural gas development and production, such as Moomba.

For example, in the USA, as a result of increased gas supply from fracking of shale gas, the cost of natural gas over the last 7 years or so has been reduced from about US$12 to US$14/GJ to the current US$3/GJ. This has had hugely significant benefits for consumers and has created substantial employment opportunities as a result of major investments in gas based energy intensive industries, while at the same time as driving down their emissions over this time. In my view, this is the reverse of what is happening in the central and eastern states of Australia, in large part because of potential gas supply being constrained by bans/moratoria on both conventional and unconventional gas exploration.

In summary, returning to the economic presentations provided to the Panel one must question the economic credibility of these so called 'economic' presenters and the objectivity of their organisations must seriously be called into question, particularly in regard to the points made above, such that one must question their entire submissions and presentations.

I would be happy to discuss these issues with you in greater detail

Yours sincerely

Bruce Holland
CEO
Elengas
Mob [redacted]
[redacted]

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About the Gippsland Basin Joint Venture

The Gippsland Basin Joint Venture (GBJV), in which Esso Australia Pty Ltd and BHP Billiton Petroleum (Bass Strait) Pty Ltd each have a 50 per cent interest, is one of the most enduring partnerships in Australia's corporate history. This significant partnership began in 1964, with Esso Australia as the operator for oil and gas exploration off Victoria's Gippsland coast.

The GBJV drilled its first well in February 1965 and was Australia's first major offshore oil and gas well. That well and the offshore facilities that followed have supported production of some **4.7 billion barrels of oil and 8 trillion cubic feet of gas.**

In 1970, the then Prime Minister of Australia, Sir John Gorton described the Joint Venture as "an example of co-operative development" that could serve as a blueprint for undertaking risky, complex projects for mutual benefit.

> *"Great risks had to be taken in order to bring this to fruition. ... The risks were equally shared between an Australian and an American company. The rewards are not so equally shared. Because close to 50 per cent of profits made, rewards gained, flow directly to the Australian people in the form of company taxation or royalties or other payments. That silent partner gets that at once."*
>
> Sir John Gorton

The result was a resources boom that transformed the Australian economy and helped to fund our much heralded social innovations through the '70s and '80s. In the half century since the first discovery, **investments of around $32 billion** in real terms has funded infrastructure including 23 offshore facilities feeding a network of about 600 kilometres of pipelines.

The GBJV truly is a partnership that changed the nation with the discovery of the world-class Bass Strait oil and gas fields and created long-lasting benefits that have shaped Australia's economic prosperity.

For further information please contact:
Guy Jakeman: g.jakeman@acilallen.com.au, +61 (2) 6103 8202

www.acilallen.com.au

ECONOMIC CONTRIBUTION

Between 1967 and 2015, the GBJV has contributed:

- Production of **4.7 billion barrels of oil** and **8 trillion cubic feet of gas.**
- *Generation of gross revenues of over **$144 billion*** (over **$330 billion** in 2016 terms).
- More than **$89 billion** of payment in Australian excises, royalties and taxes (over **$220 billion** in 2016 terms).
- On average around **1,000 workers** per year have been directly employed.
- More than **$12.9 billion** of ongoing operations expenditures (**$31 billion** in 2016 terms).
- $10.7 billion of capital works (**$32 billion** in 2016 terms).

Over its life to date, the project has:

- Produced **54 per cent** of all of Australia's crude oil and liquids.
- Supplied over **40 per cent** of all of Eastern Australia's natural gas.
- Contributed an average of **2.5 per cent** of all Commonwealth Government tax receipts (with an average of **10 per cent** a year over the ten years between 1976 and 1985).
- Added **$570 billion** to the Gross Domestic Product of Australia (**$11.6 billion** per year).
- Improved the real incomes (or economic welfare) of Australian residents by more than $640 billion (or **$13.1 billion** per year) or **$780 per person per year.**
- Stimulated nearly **370,000 full time** equivalent (FTE) job years of employment throughout Australia.

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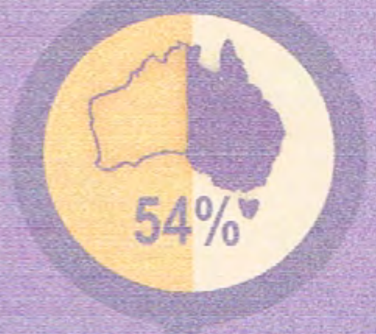
Between 1967 and 2015 the Gippsland Basin Joint Venture has...



Produced more than half of Australia's crude oil and hydrocarbon liquids.

Provided enough fuel to fill every car currently on the road in Australia 500 times.

Provided enough gas energy to power the MCG's lights for 3.3 million years.

Improved the real income of Australians by more than $640 billion. That is $780 per year for every person in this country.

Contributed an average of 2.5% of all Commonwealth Government tax receipts. That is over $220 billion (in 2016 terms), making it one of the largest Commonwealth revenue sources in history.

Paid the equivalent of 18% of total private and public hospital expenditure.

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Australian Bureau of Statistics

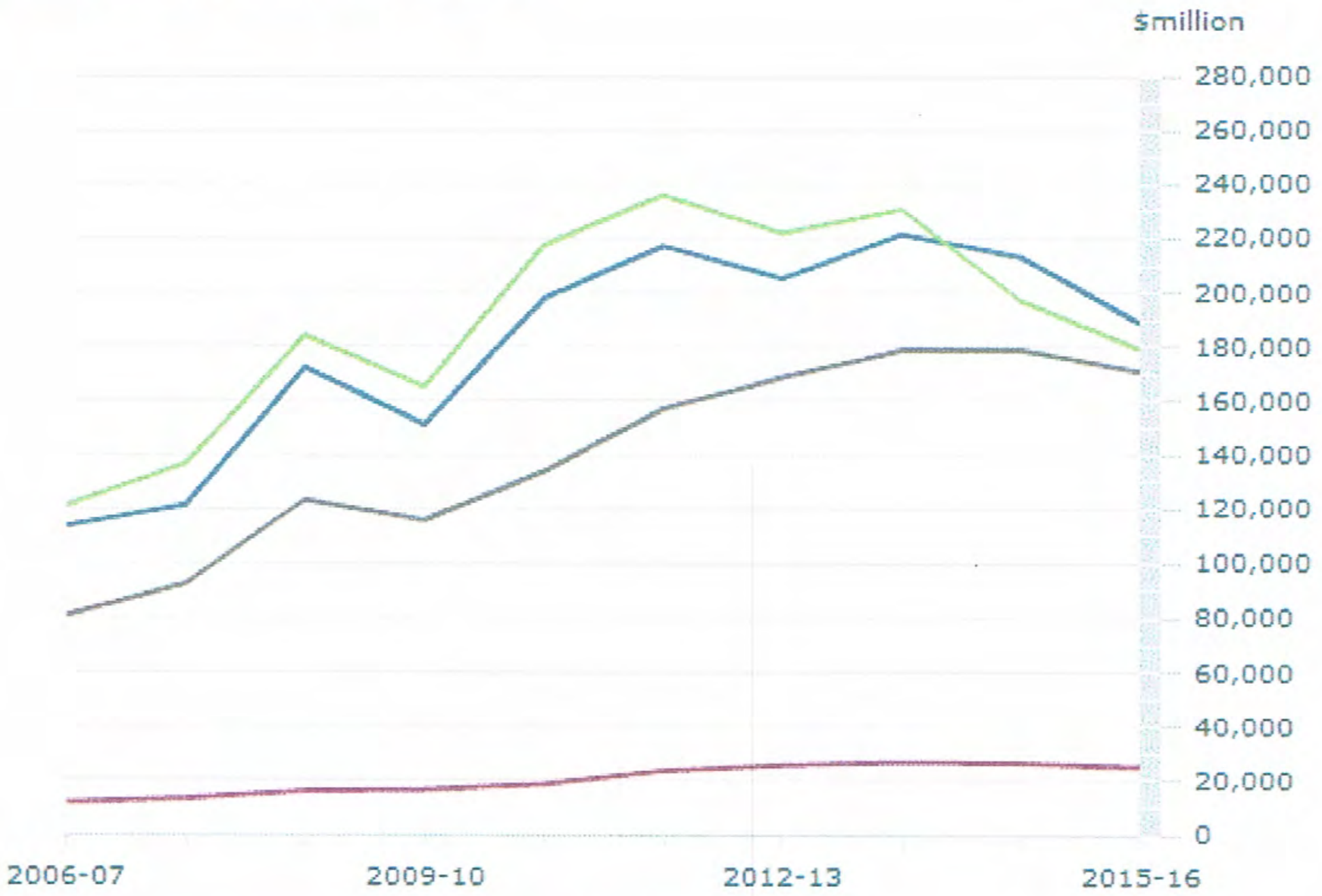
8155.0 - Australian Industry, 2015-16 Quality Declaration

Latest ISSUE Released at 11:30 AM (CANBERRA TIME) 26/05/2017

MINING INDUSTRY 2015-16

The **Mining** industry contracted across most key indicators in 2015-16. Earnings before interest, tax, depreciation and amortisation (EBITDA) decreased 17.5% ($12.9b) to $60.8b in 2015-16, with the largest decreases in **Metal ore mining** (17.3% or $7.3b) and **Oil and gas extraction** (27.8% or $6.6b) related to falling commodity prices. These price reductions caused the **Mining** division Export Price Index to fall by 17.3% between 2014-15 and 2015-16. Employment and wages and salaries also continued to decline over this period.

Mining industry, 2006-07 to 2015-16



Select a different graph

Income and Expenses

Save Chart Image

Australian Bureau of Statistics

Footnote(s): (a) Includes rent, leasing and hiring income. (b) Includes capitalised wages and salaries, salary sacrificed amounts and other remuneration; excludes the drawings of working proprietors. (c) Includes working proprietors and partners of unincorporated businesses.

Source(s): Australian Industry (cat. no. 8155.0)

2015-16 KEY MINING INDUSTRY FIGURES

	Employment at end June			Sales and service income			EBITDA(a)		
	2014-15	2015-16	2014-15 to 2015-16	2014-15	2015-16	2014-15 to 2015-16	2014-15	2015-16	2014-15 to 2015-16
	no.	no.	%	$m	$m	%	$m	$m	%
06 Coal mining	40 548	37 176	-8.3	45 869	44 117	-3.8	6 015	6 399	6.4
	22 760	19 147	-15.9	41 369	34 616	-16.3	23 594	17 043	-27.8

07 Oil and gas extraction									
08 Metal ore mining									
0801 Iron ore mining	31 584	30 807	-2.5	70 413	54 937	-22.0	33 856	25 237	-25.5
0803 Copper ore mining	5 913	5 297	-10.4	np	5 645	np	1 089	1 831	68.1
0804 Gold ore mining	14 218	15 226	7.1	13 306	14 975	12.5	4 299	5 016	16.7
0805 Mineral sand mining	3 694	3 385	-8.4	np	2 613	np	510	607	19.0
0807 Silver-lead-zinc mining	4 541	3 913	-13.8	np	4 937	np	1 175	1 423	21.1
0802, 0806, 0809 Bauxite, nickel and other metal ore mining	7 368	6 351	-13.8	8 258	7 294	-11.7	1 485	985	-33.7
Total 08 Metal ore mining	**67 318**	**64 978**	**-3.5**	**104 129**	**90 402**	**-13.2**	**42 415**	**35 098**	**-17.3**
09 Non-metallic mineral mining and quarrying	12 176	12 129	-0.4	6 094	6 089	-0.1	^992	^1 110	11.9
10 Exploration and other mining support services	34 868	30 054	-13.8	15 865	13 719	-13.5	**664	*1 109	67.0
Total mining	**177 670**	**163 484**	**-8.0**	**213 326**	**188 943**	**-11.4**	**73 679**	**60 760**	**-17.5**

^ estimate has a relative standard error of 10% to less than 25% and should be used with caution
* estimate has a relative standard error of 25% to 50% and should be used with caution
** estimate has a relative standard error greater than 50% and is considered too unreliable for general use
np not available for publication but included in totals where applicable
(a) Earnings before interest tax depreciation and amortisation.
Source: Australian Industry 2015-16 (cat. no. 8155.0)

Employment in the **Mining** industry fell by 8.0% (14,186 people) with this contraction spread across almost all components of the industry. **Exploration and other mining support services** fell the furthest, reducing by 13.8% (4,814 people), while **Oil and gas extraction** fell 15.9% (3,613 people) and **Coal mining** decreased by 8.3% (3,372 people).

Sales and service income and EBITDA in the **Mining** industry declined in 2015-16 by 11.4% ($24.4b) and 17.5% ($12.9b) respectively. In both cases the majority of the decrease came from the **Metal ore mining** and **Oil and gas extraction** subdivisions. Lower sales figures for **Metal ore mining** were mainly the result of a large fall in iron ore prices, illustrated by a 17.2% fall in the **Metal ore mining** subdivision Export Price Index between 2014-15 and 2015-16. Similarly falling oil prices had a negative impact on the sales and service income reported for **Oil and gas extraction**. The Export Price Index for **Petroleum, petroleum products and related materials** fell by 33.5% between 2014-15 and 2015-16.

The estimates in this publication are not adjusted for situations where businesses report to the ABS on an off-June reporting year and can be impacted by price fluctuations. This particularly impacts on estimates for the **Mining** industry where reporting largely reflects the calendar year 2015. For estimates adjusted to a June financial year basis, see the 'Off-June adjusted estimates by subdivision' data cube, and for more information about the impact of off-June reporting on estimates, see the Technical note on Off-June Year adjusted estimates in this issue.

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