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Oil and gas extraction in Australia

JANUARY 2017

The Australian oil and gas extraction industry is growing, and projections indicate that both production and export are likely to continue increasing. The industry by nature involves large, capital-intensive and complex plants and potentially volatile, often toxic products.

Export performance is directly correlated with industry performance

First things first: let's get some of the industry jargon out of the way. LNG (Liquefied Natural Gas) is formed when natural gas is cooled to a very low temperature, whereas LPG (Liquefied Petroleum Gas) is naturally occurring gas – such as propane – which is kept under pressure to keep it in liquid form. A condensate is a type of light crude oil that, when released as a gas from high-pressure wells, becomes liquid.

The oil and gas extraction industry mainly produces crude oil, natural gas or condensate from oil and gas deposits. Companies in the industry may purify natural gas, liquefy hydrocarbon gas or operate natural gas absorption or separation operations. Some produce LNG and LPG.[i]

These are the 'big guns', often household-word players, such as Woodside Petroleum, BHP Billiton, Chevron Australia Holdings, ExxonMobil Australia, Santos and Shell Energy Holdings Australia, not 'mom-and-pop' enterprises. And yet, the industry's health and performance affects, at least indirectly, every household and business in Australia.

Key factors

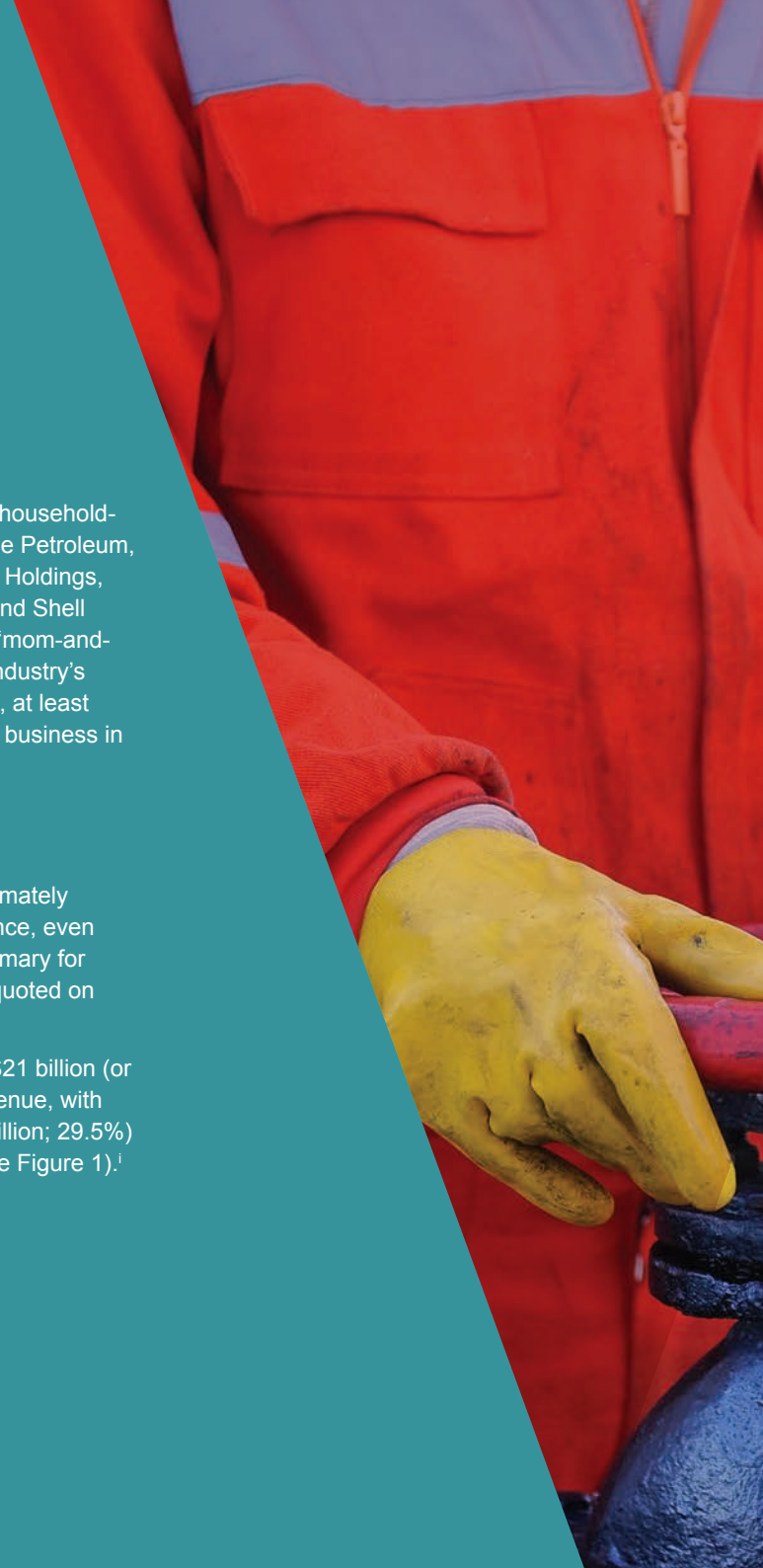
The vagaries of world oil and gas prices, the Australian dollar/US dollar exchange rate, the 10-year bond rate, domestic and export demand for the product, and production volumes are the main influences on the industry's performance.[i] Their impact is complex, which results in volatile revenues for the industry. Although the domestic industry output, measured in barrels of oil equivalent (BOE), has increased in the last five years and the global demand for LNG in particular has increased significantly in the same period, global oil and gas prices have both declined (this, despite the fact that until 2014, LNG prices remained buoyant as long as increased demand challenged supply volumes and a weaker Australian dollar supported export).[i]

An estimated three-quarters of the $38 billion in 2016-2017 revenues can be attributed to exports: LNG export dominates (57.8%), followed by crude oil (17.2%) and LPG (1.7%).[i] This speaks volumes about the industry's vulnerability to foreign demand for the commodity, trends in oil and gas output, the US-dollar price they can command and fluctuations in the value of the Australian dollar. Put simply, export performance is directly correlated with industry performance.

The strength of the Australian dollar against the US dollar has a direct effect on domestic industry revenue. For example, the relatively weak Australian dollar limited local price drops (and protected local revenue) when there was a global slump in oil prices during 2015-2016.

The global crude oil price is intimately linked to the industry performance, even for gas extraction, as it is customary for contracts for gas supply to be quoted on benchmark oil prices.

Natural gas accounts for over $21 billion (or 56.1%) of the total industry revenue, with crude oil and condensate (11 billion; 29.5%) leading the rest of the pack (see Figure 1).[i]



Products and services segmentation (2016-17)

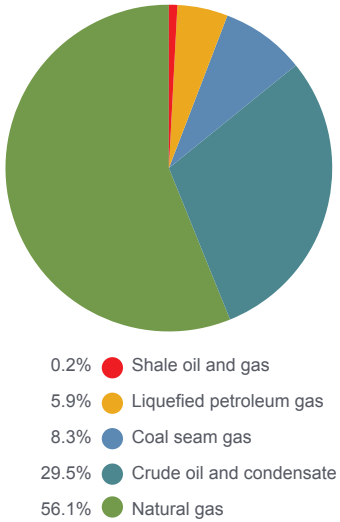


Figure 1. Products and services contribution to revenue (IBISWorld Industry Report B0700 *Oil and Gas Extraction in Australia* – September 2016)

Output (%)

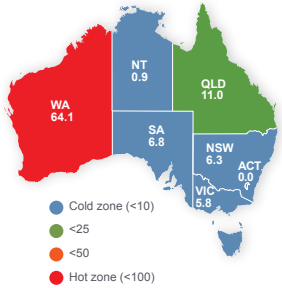


Figure 2. Geographical distribution of the oil and gas extraction industry (IBISWorld Industry Report B0700 Oil and Gas Extraction in Australia – September 2016)

The distribution of the industry is directly linked to the geographical location of the known and worked oil and gas fields (Figure 2); the emphasis, therefore, is on Western Australia (WA), which accounts for 64.1% of industry activity (including revenue, production, firms and employment). The other states lag far behind (Queensland [QLD] 11%; South Australia [SA] 6.8%; New South Wales [NSW] 6.3%; Victoria [VIC] 5.8%; Tasmania [TAS] 5.1%; Northern Territory [NT] 0.9%) or have no industry representation at all (ACT 0.0%).[i]

WA has dominated the industry since the discovery and development in the 1980s of rich offshore oil and gas deposits, known as basins. Today, the most important productive offshore basins are the Carnarvon and subsidiary basins (off WA; natural gas, LNG, LPG and/or crude oil), Gippsland basin (off VIC; oil, LPG and natural gas in declining volumes), and Bonaparte basin (off NT; oil and gas).

Onshore basins of note include the Cooper/Eromanga basin (shared by QLD and SA; oil is extracted on both sides of the border, while LPG and natural gas extraction is confined to the SA side); Perth basin (north of the city; limited oil and gas production); Canning basin (WA; small volumes of oil); Amadeus basin (NT; gas); Bowen-Surat and subsidiary basins (QLD; oil and/or gas); Adavale basin (QLD; natural gas) and Otway basin (VIC; natural gas and condensate).

NSW and QLD have large reserves of coal seam gas (CSG) – specifically, methane – the extraction of which is expected to increase over the next five years as the export of gas from QLD gains momentum. The development of CSG mining is dogged by controversy,[ii] blurred policy boundaries and regulatory constraints, however, and the extraction of CSG – known as fracking – continues to be a hotly debated topic among environmentalists, agriculture and community groups alike.

Going global: oil and gas extraction 2005-2016

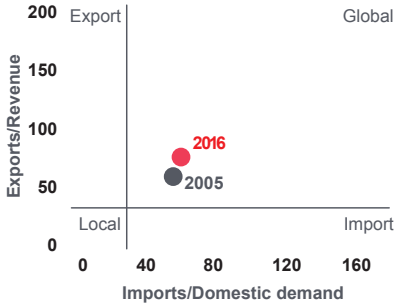


Figure 3. Globalisation in the oil and gas extraction industry (IBISWorld Industry Report B0700 Oil and Gas Extraction in Australia – September 2016)

There are six main players in the industry, namely (in order of market share) Woodside Petroleum (14.2%), BHP Billiton (12.1%), Chevron Australia Holdings (11.6%), ExxonMobil Australia (11.3%), Santos (11.0%) and Shell Energy Holdings Australia (10.8%). There is medium market share concentration, with the four largest companies accounting for 49.2% (and the top seven, approximately 75%) of 2016-2017 industry revenue.[i] Industry concentration has increased in recent years as major players have continued to increase their market share and benefit from economies of scale, while high barriers to entry (such as the high-risk nature of oil and gas extraction and the onerous capital investment) have limited external competition from new contenders.

Internal competition between oil and gas extraction companies is high and steady, however, and is largely based on price, rather than product differentiators.

The industry features high and increasing globalisation (see Figure 3). Foreign ownership (Shell, Exxon, Chevron) dominates local (Woodside) or part-local ownership (BHP Billiton) and the international trade of both exports and imports is a feature. Oil and gas exports are estimated to contribute more than 75% of industry revenue for 2016-2017 and this figure is expected to increase over the next five years as Asian LPG demands soar.[i]

Industry performance

Revenues are predicted to increase at a modest 1.4% for the five years to 2017 to reach $38.0 billion, with industry outputs barely offsetting the 2014-2016 falls in oil and gas prices.[i] Declining crude oil production from Australia's mature oil resources have negatively affected revenue growth, despite healthy LNG volumes over the last five years.[i] In fact, gas extraction has been the fastest growth nexus for the industry during this period, with increasing global demand driving prices up in a marketplace where few countries compete for international LNG trade.

The long lead-time to production (typically 10 years) of asset investment means that large projects currently under construction are due to come online in the next five years, further boosting production levels that have been increasing over the last five years. Furthermore, with established export terminals in WA, Australia is in a strong position to benefit from the burgeoning LNG demand from Japan, which has converted to gas-fired energy supply in the wake of the 2011 Fukushima disaster.[i]

Investments are typically long term in the oil and gas extraction industry; fixed production costs can be high; and the tax burden of producers has increased since 2012. All of these factors conspire to drive profits down.

Export growth in the industry is expected to soar in the short term in response to a surge in both global demand and domestic production: Australian output is pegged at 567 million BOE in 2016-2017, which represents an increase of 14.3% for the year.[i] This, combined with anticipated higher prices, means that industry revenues are expected to jump 16.8% for the same period.[i] Interestingly, despite industry consolidation reducing the number of enterprises, employment in the industry has risen markedly over the last five years in tandem with the growth in revenues and output.[i]

So-called unconventional resources (CSG, shale gas and shale oil) are subject to controversy and regulations vary between states; however, Australia is rich in these resources and output is growing from approved outlets. For example, LNG from Queensland CSG has been exported in increasing volumes since 2014-2015.[i]

The Australian oil and gas extraction industry is growing

Operating conditions

Capital intensity is high in the industry, with large amounts of capital being required to develop new – or upscale existing – fields. Wage costs, even considering a highly skilled and well-paid workforce, are relatively insignificant against capital costs.

All stages of production are heavily regulated. The Commonwealth controls mining beyond a three-mile nautical limit; the states control both the landward side of that limit and all onshore oil production. Both onshore and offshore operations are subject to a three-tier system: that is, an exploration permit, a retention lease preserving tenure on as-yet non-commercial discoveries, and a production licence.

Under a gas reservation policy, WA producers are compelled to reserve 15% of gas for domestic consumption. Since July 2012, an onerous Petroleum Resource Rent Tax (PRRT) of 40% has been levied on all onshore and offshore oil and gas production, including CSG operations that are not incidental to coal mining-

The industry receives no tariff – or direct non-tariff – protection, nor does it receive any government subsidies or grants.

Powering ahead…

The Australian oil and gas extraction industry is growing, and projections indicate that both production and export are likely to increase over the next five years to 2022. By 2021-22, revenue is predicted to reach more than $61 billion – even in the face of stabilising oil and gas prices – 85.7% of which will be contributed by a still-expanding export market. Production in 2021-22 is estimated to be 821 million BOE.

…yet always subject to operational risks

The oil and gas extraction industry, by its very nature, involves large, capital-intensive and complex plant and potentially volatile, often toxic products. The outbreak of fire on an oil or gas field is always a potential risk; pipe failure or an oil spill could have a devastating environmental impact; and equipment breakdown or failure could cause significant disruption or pose a risk of personal injury. Needless to say, scale of operation is no protection: even the largest operations are vulnerable.

Any one of these scenarios may cause business interruption, with potentially major loss of revenue – especially when oil prices are high – and perhaps damage to the company's reputation. Media and local community interest is readily piqued by visually dramatic oil spills, fires or explosion, and a company's ability to rapidly contain or limit the damage may prove vital for its ongoing image management.

Insurance may not prevent either disaster or business interruption, but it can provide peace of mind and may soften the financial blow if things go awry. A reputable insurance company should offer specialised risk engineering analysis of the site-specific operational risks, and should be able to offer practical advice on mitigating such risks. Appropriate insurance cover might include General Liability, Environmental Impairment Liability, Professional Indemnity, Directors' and Officers' Liability, Industrial Special Risks and even Cyber insurance.

i IBISWorld Industry Report B0700 Oil and Gas Extraction in Australia – September 2016.

ii St John, A, The coal seam gas debate, Parliament of Australia http://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/BriefingBook44p/GasDebate

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