

Economic and Employment Contribution of the Australian Gas Industry Supply Chain: 2020-21



Australian Gas Industry Trust

In partnership with



A E A S

Australian Economic
Advocacy Solutions

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REPORT PREPARATION

This report has been prepared by AEAS for AGIT in partnership with APGA, APPEA, ENA, GAMAA and GEA .

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Executive Summary

AEAS has been engaged by Australian Gas Industry Trust to analyse the employment and economic contribution of the Australian Gas Industry Supply Chain. The key finding of this report is that the gas industry supply chain is crucially important to Australia – creating employment opportunities and driving economic activity.

As a result of its domestic, commercial, industrial and export uses the Australian Gas Industry has a significant supply-chain both upstream and downstream with small businesses through to major international companies all supplying goods and services to create economic value from gas.

As at 30 June 2021 there were an estimated 46,833 businesses across exploration, extraction, processing and supply and the manufacturing, construction, transport, retail and wholesale and the professional and technical services businesses that also underpin the gas supply chain.

It is the aggregation of all of these individual businesses in the supply chain that collectively leads the Gas Industry to be an extremely important industry sector and employer in Australia providing \$55 billion in direct economic activity and over 165,000 jobs.

As at the 30 June 2021 the Australian Gas Industry Supply Chain directly:

- Employed 165,538 (FTE) Australians;
- Offered a pathway into the workforce for 2,223 younger Australians in apprenticeships and traineeships; and
- Further engaged 23,748 contractors across all States.

In the 2020-21 financial year the Australian Gas Industry Supply Chain directly:

- Provided \$14.9 billion in wages to Australians with an average livelihood \$90,200 and compares against Australian average annual earnings of \$67,902;
- Has a total turnover of over \$64 billion;
- Further supports Australian businesses with over \$27.4 billion in supply chain opportunity creating an additional 95,306 indirect jobs;
- Invested over \$11.1 billion annually in its own future providing for future jobs and community prosperity;
- Provided over \$18.2 billion in Commonwealth, State and Local Government taxes, rates, fees and royalties supporting frontline services and social infrastructure across all Australian states;
- Provided over \$55.1 billion in direct industry value add to the Australian Economy; and
- Has over \$265 billion in assets under management.

In summary:

- The Gas Industry Supply Chain directly employs 1 in every 54 Australians in the workforce.
- The Gas industry Supply Chain is directly providing 3 cents in every dollar of economic activity in Australia.
- The Gas Industry Supply Chain is enabling \$470 billion in economic activity in Australia each year as an essential energy source.

On the basis of jobs created per 100 jobs, cents provided in every dollar of economic activity, comparison against over industry sector employers and other industry sector economic contributors, the Australian Gas Industry Supply Chain is of major importance to the Australian economy and community and has higher importance than many other industry sectors such as private health care, building construction, food retailing, road transport, agriculture, telecommunication services, private hospitals and accommodation.

However the Australian Gas Industry Supply Chain is not only an economic one. In regional areas, the gas industry acts as a foundation for prosperity across many townships due to supply chain spend and the livelihood provided to employees and their spend that this delivers to local businesses. In short, the Australian Gas Industry Supply Chain represents a critical element for the viability for many regional communities.

This report concludes that the Australian Gas Industry Supply Chain delivers jobs and economic activity and as an essential energy source provides for everyday living and value add in Australia's economy. When fully understood the gas industry has a compelling 'social and economic licence'.

1.0 Introduction

Australian Economic Advocacy Solutions (AEAS) was engaged by Australian Gas Industry Trust (AGIT) to analyse the employment and economic contribution of the Gas Industry Supply Chain to the Australian community. The importance of the Australian Gas Industry can only be fully understood when holistically considered across exploration, extraction, processing and supply and the manufacturing, construction, transport, retail and wholesale and the professional and technical services businesses that underpin it together with valuable role it plays for society and industry as an energy source for economic activity.

Decision makers are largely unaware of the considerable contribution that this entire supply chain makes to the Australian economy and employment due to an absence of accurate and timely estimates of its contribution. The scope of this project fills that void. This report outlines the considerable direct economic and employment contribution of the Gas Industry’s extensive supply chain both upstream and downstream thereby assisting Australians to better understand how the gas industry benefits their community and everyday living.

Table 1: Definitions of Gas

Type	What is It
Natural Gas	Natural gas is a type of fossil fuel and is a naturally occurring hydrocarbon. It’s colourless, odorless and consists mainly of methane, but can also contain varying amounts of other gases such as propane and butane. Natural gas is found in several different types of rocks, including sandstones, coal seams and shales. Energy generated by natural gas is highly complementary to intermittent energy sources like wind and solar due to the fact that natural gas plants are especially fast-reacting and able to kick in quickly when intermittent sources are unable to cover demand.
Liquefied Petroleum Gas	Australia is a net exporter of LPG and around 80% of the LPG produced domestically is an output of natural gas processing. It is a mix of propane and butane gases and has a variety of uses. It’s most commonly used for space and water heating in Australian households and businesses, for cooking, especially outdoor barbeques, in industry and for fuelling vehicles.
Liquefied Natural Gas	Liquefied natural gas – more commonly referred to as LNG – is natural gas (primarily methane and ethane) which has been chilled to -161oC so that it becomes a liquid. Once it has been liquefied, the methane takes up much less space. In fact, LNG occupies about 1/600 the space of methane. In its liquefied form it can be exported in purpose-built tanker ships. LNG is also used in Australia, mainly for power generation in remote areas that require significant amounts of energy eg, mines, and as a marine fuel.
Compressed Natural Gas	CNG is natural gas compressed at various pressures. CNG is mainly used in Australian industry for a variety of purposes, including powering forklift trucks, and as a back-to-base transport fuel in applications such as city buses and delivery services.
Hydrogen	Hydrogen offers opportunities in many sectors and Australia’s gas infrastructure is well placed to decarbonise residential and commercial gas use by adopting hydrogen. While hydrogen is already produced commercially, its current role has been limited as a feedstock and not as an end use fuel in appliances.
Others	Biomethane and Renewable Gases

Source: AEAS and Energy Information Australia

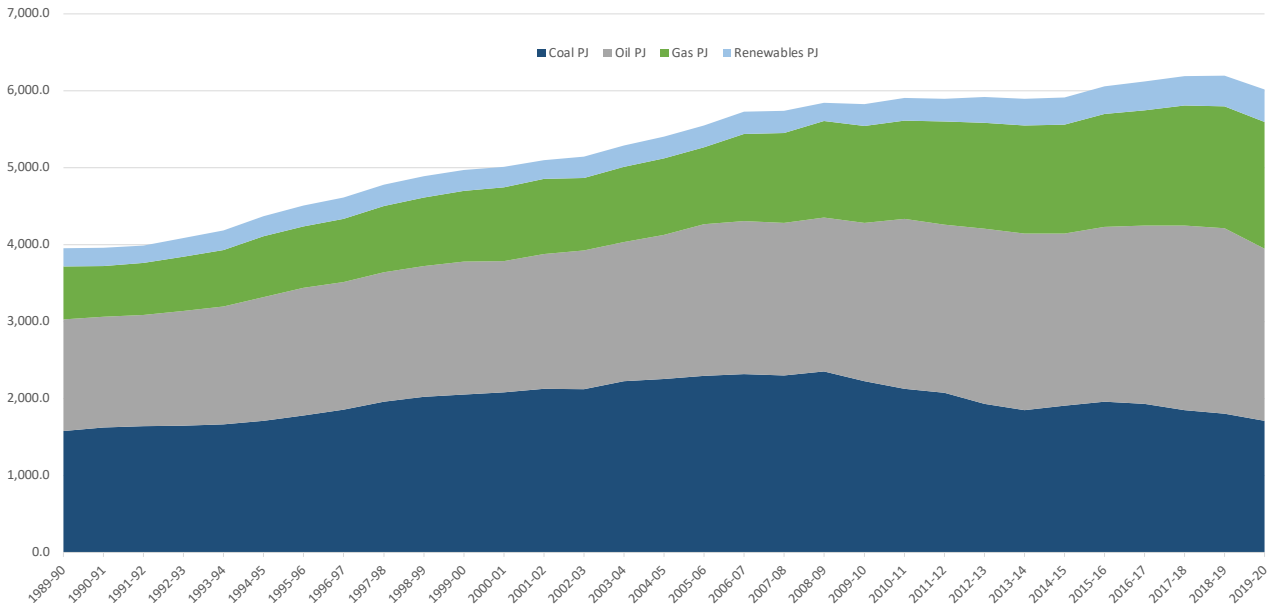
2.0 The role of Gas in Australia

Australia is gifted with abundant natural resources and the resulting gas Industry plays a critical role in supporting the community — not only in meeting our domestic energy needs but also generating considerable export revenues.

The importance of gas to Australia as an energy source has increased over the past two decades and now comprises 27.8% of Australia’s total energy consumption. This has steadily increased from only 17.4% in 1989-90. On average gas consumption over the past decade has grown by 2.5% each year and compares to average growth for all energy consumption of 0.3% (see figure 1).

This growth has been driven by the discovery of new world-class gas reserves and natural gas and is considered a key component of Australia’s goal of reducing the carbon intensity of our economy and helping Australia reduce its carbon emissions.

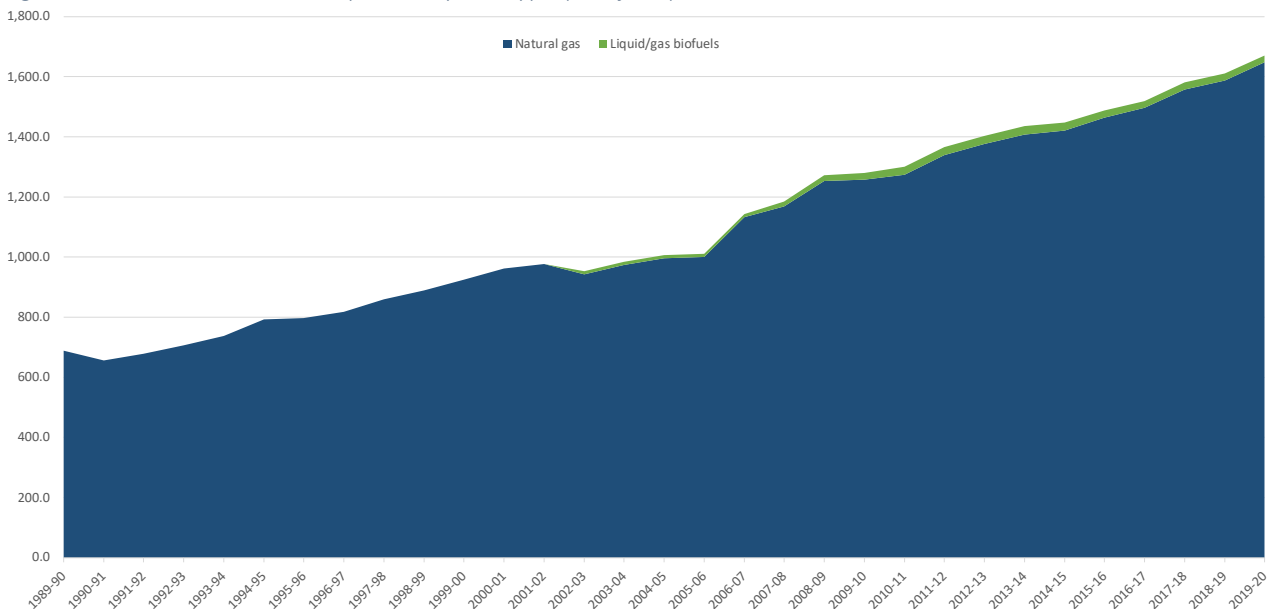
Figure 1: Australian Energy Consumption – by fuel type (Petajoules)



Source: AEAS and Department of Industry Science, Energy and Resources

The extent of Australia’s increase in gas consumption and the emergence of liquid gas in particular and biofuels is illustrated in Figure 2 below. Energy forecasts show that primary energy and gas demand will continue to grow to mid-century, in line with forecasted increases in population

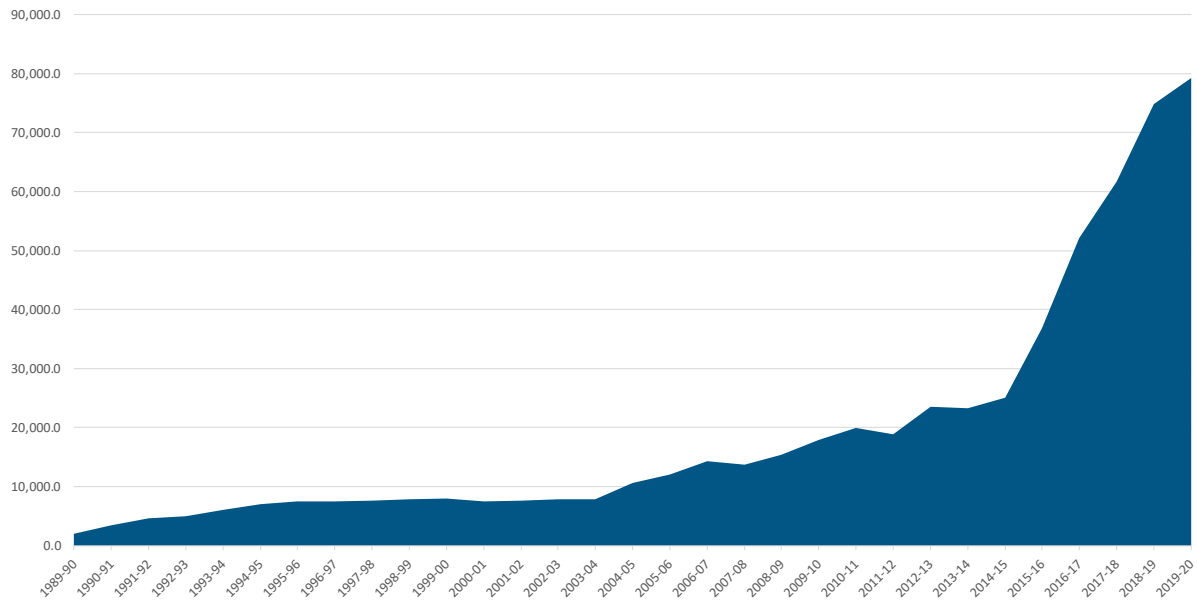
Figure 2: Australian Gas Consumption – by fuel type (Petajoules)



Source: AEAS and Department of Industry Science, Energy and Resources

Finally Australia’s Gas Industry has become a globally significant energy producer - the world’s second largest LNG exporter (see figure 3). Australia has been exporting liquefied natural gas (LNG) since 1989, initially from developing gas reserves offshore in Western Australia and the Northern Territory and now in Queensland. Australia is one of the world’s leading suppliers of LNG and has multiple operating LNG projects which are further creating employment opportunities, delivering export income and tax revenue.

Figure 3: Australian LNG Exports (kt)



Source: AEAS and Department of Industry Science, Energy and Resources

3.0 How Gas is Used in Our Economy and Community

The employment and economic estimates detailed in this report directly arise because of its essential role as an energy source to create and add value. Australians use gas every day to power their lives and economy.

3.1 Domestic Uses

In domestic application gas is used for heating, lighting and cooking. Temperature regulation is also one of the most popular applications of natural gas. It is an energy efficient and convenient approach to both heating and cooling, and like cooking it is easy to control the temperature. A number of appliances including stoves and ovens, gas heaters, water heaters, barbecues, outdoor lights, bar heaters, tumble dryers, pool heaters and fireplaces can be powered safely and efficiently by gas.

Figure 4: How Gas is Used In Manufacturing

Household products made using natural gas

As well as creating energy, natural gas provides the base ingredients for a broad spectrum of products including plastics, fertiliser and fabrics.

 Pharmaceuticals	 Mobile phones	 Safety glasses	 Car tyres	 Dental hygiene products
 Life jackets	 Fridges	 Cosmetics	 Art tools	 Musical instrument strings
 Insecticide & fertiliser	 Insect repellents	 Bandages	 Artificial limbs	 Tents

Source: Energy Information Australia

3.2 Commercial and Industrial Uses

The commercial applications of natural gas are similar to the residential uses. Gas is extremely efficient and economical and is used to create fertilisers and supply power plants that generate electricity for commercial and domestic users. The fuel is also used in manufacturing glass, steel, plastics, paint, fabrics and can power trains, cars, buses and trucks. Natural gas is also used to generate electricity.

Often it can be used in the same way as other fossil fuels as a cleaner alternative. Natural gas is a viable alternative fuel particularly useful in the transportation sector. Across the country, gas is also an essential component of industry, providing low or high temperature heating and is used as a feedstock like in ammonia production.

3.3 Gas Usage in Australia By Region

The main roles of gas vary by region. In Victoria and Southern NSW, gas is essential in providing heating to households during winter. More than 80 per cent of homes in these regions are connected to the gas network and gas delivers more energy to homes than electricity. In South Australia, Western Australia and the Northern Territory, gas is essential for power generation. Almost all power in the Northern Territory is generated from gas. In Queensland, Northern Territory and Western Australia, gas is important as an LNG export industry, providing many regional jobs and generating state and federal royalties and taxes¹⁷ that support many activities to benefit all Australians. Table 2 provides a qualitative assessment of the role of gas by region around the country. Gas clearly makes an essential contribution in every region.

Table 2: Gas Usage in Australia By Region

Region	Residential	Commercial	Industrial	Power Gen	Exports	Gas as % of Total Energy Consumption
NSW	✓✓	✓✓✓	✓✓✓	✓	NA	9.7%
VIC	✓✓✓	✓✓✓	✓✓	✓	NA	23.5%
QLD	✓	✓✓	✓✓✓	✓	✓✓✓	21.4%
SA	✓✓✓	✓✓✓	✓✓	✓✓✓	NA	54.6%
WA	✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓	35.2%
TAS	✓✓	✓	✓✓✓	✓✓	NA	7.2%
NT	✓✓	✓	✓✓	✓✓✓	✓✓✓	74.5%

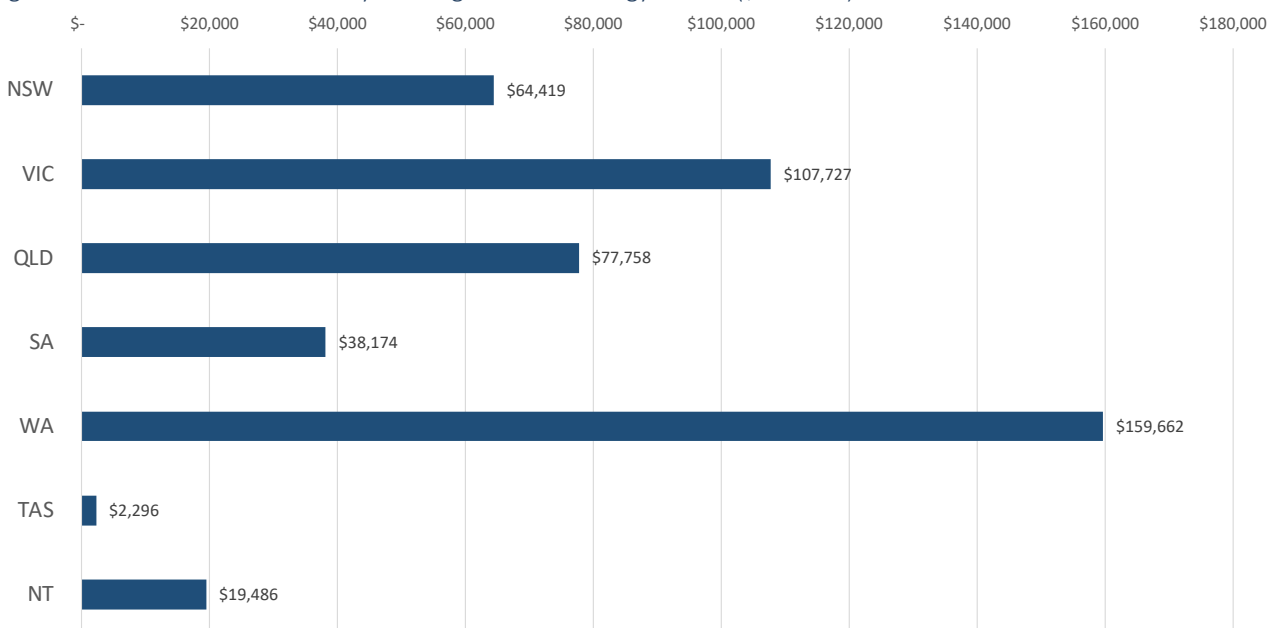
Code: ✓✓✓ = essential contribution ✓✓ = major contribution ✓ = minor contribution

Source: Gas Vision 2050 Delivering a Clean Energy Future September 2020 AGIT, AEAS & Department of Industry Science, Energy and Resources

3.4 Economic Value of the Australian Gas Industry Supply Chain’s Enabled Benefit

The industry, business and community's use of gas provides significant enabled economic activity for Australia. Estimates prepared by AEAS in 2019-20 of this enabled benefit are in the order of \$469.6 billion. A state breakdown of gas’s enabled benefit as an energy source is provided in Figure 5 below.

Figure 5: Enabled Economic Activity Utilising Gas as an Energy Source (\$ millions)



Source: AEAS and Department of Industry Science, Energy and Resources

4.0 Understanding the Gas Industry Supply Chain

4.1 The Supply Chain Explained

As a result of its domestic, commercial, industrial and export uses the Australian Gas Industry has a significant supply-chain both upstream and downstream with small businesses through to major international companies all supplying goods and services to create the economic value of gas. Utilising the Australian Bureau of Statistics' Australian New Zealand Standard Industrial Classification, mapping of the Australian Gas Industry Supply Chain includes the following activities:

Table 3: Types of Business in the Australian Gas Industry Supply Segment

Segment	Types of businesses
Mining	Mining includes gas exploration, natural gas extraction, petroleum gas extraction and other mining support services – including cementing oil and gas well castings; directional drilling and re-drilling; mining draining and pumping service; oil and gas field support services.
Manufacturing	Manufacturing includes gas oil manufacturing, liquefied petroleum gas (LPG) manufacturing, industrial gas Manufacturing including liquefied natural gas and hydrogen, pipe fittings, manufacturing, gas cylinder manufacturing, gas fittings and meter manufacturing, truck manufacturing, machinery and equipment manufacturing, gas appliance manufacturing – including stoves, BBQ's, heating, fridges, air conditioner & compressors etc, gas compressor manufacturing and gas cutting and welding equipment manufacturing.
Electricity & Gas	Electricity and Gas includes gas supply - including coal gas distribution through mains system; fuel gas distribution through mains system; liquefied petroleum gas distribution through mains system; liquefied petroleum gas reforming for distribution through mains system; and natural gas distribution through mains system, electricity generation using mineral gas, other electricity generation including biofuels, electricity transmission and distribution and electricity retailing.
Construction	Construction includes non-residential building construction eg buildings, pipeline construction, heavy and civil engineering construction – non pipeline and gas plumbing – residential and non-residential.
Wholesale & Retail Trade	Wholesale and Retail Trade includes liquefied petroleum gas (LPG) (in bulk or in containers), commercial vehicles, gas plumbing and fittings and gas appliance retailing – including stoves, BBQ's, heating, fridges, air conditioner & compressors.
Transport, Postal & Warehousing	Transport, Postal and Warehousing includes road freight including bulk gas, rail Freight including bulk gas, shipping Freight including bulk gas and pipeline operations.
Professional, Scientific & Technical Services	Professional, Scientific and Technical Services includes scientific research services, engineering design and engineering consulting services – including architectural, surveying, legal and accounting services, advertising services, management and consulting services, computer system design and related services, communication services, banking and insurance services and employment services - including placement; recruitment and labour supply.
Other Services	Other Services includes automotive repair and maintenance and machinery and equipment repair and maintenance.

Source: AEAS and Australian Bureau of Statistics

4.2 Estimated Number of Gas Industry Supply Chain Businesses

In total, there are an estimated 46,833 gas industry supply chain businesses operating as at 30 June 2021 (see table 4). The most significant numbers of businesses operating are in the wholesale and retail (14,105), construction (11,085) and transport (8,695) segments. By state, Western Australia (19,478) has the highest number of businesses in the gas industry supply chain followed by Queensland (8,861) and then Victoria (8,133).

Table 4 : Number of Businesses Operating in Gas Industry Supply Chain as at 30 June 2021

State	Value Chain Component	
	No	No
WA	19,478	Wholesale & Retail 14,105
QLD	8,861	Construction 11,085
VIC	8,133	Transport 8,695
NSW	3,984	Manufacturing 6,905
NT	3,114	Professional & Technical 4,700
SA	3,063	Electricity and Gas 589
TAS	199	Mining 426
		Other 327
AUS	46,833	TOTAL 46,833

Source: AEAS 2021& ABS Catalogue 8165.0

5.0 The Economic and Employment Contribution of the Gas Industry Supply Chain

5.1 Overview

Australia's gas industry supply chain is a key driver for the national and State economies. At a headline level there are many large-scale natural gas projects that have come onstream in recent years with billions of dollars in new investment to bring more gas into the market, supporting both domestic gas consumption and the export projects. However as indicated above the gas industry supply chain is considerably more than these headline projects. It is the entire supply chain both upstream and downstream that acts as the major contributor to Australia's economy.

Collectively the thousands of businesses in the supply chain are providing investment, job creation, regional development, export revenue and taxation receipts to government. Furthermore the economic activity and jobs provided by the gas industry supply chain are in rural and regional towns, providing a range of side benefits including upskilling and educational opportunities as well as creating stronger, more resilient local communities.

5.2 AEAS Estimates Methodology

AEAS estimates detailed in this report were developed through an electronic Industry 'Census' questionnaire circulated by AGIT for completion by members of organisations including:

- Australian Pipelines and Gas Association;
- Australian Petroleum Production & Exploration Association;
- Energy Networks Australia;
- Gas Appliance Manufacturers Association of Australia; and
- Gas Energy Australia

Through this process credible and actual data on the direct employment and economic contribution of the supply chain across the following areas were calculated:

- The contribution the supply chain makes to Australian GDP and State GSP in industry value add;
- The number of direct jobs created by the supply chain;
- The value of wages and salaries paid by the supply chain;
- Level of investments made in Australia by the supply chain;
- The value of Commonwealth, State and Local Government taxes, royalties and rates contributed by the supply chain;
- Total assets held by the supply chain in Australia.

The report seeks to solely capture the direct employment and economic contribution from the domestic Australian gas industry supply chain including supply chain for export markets.

All estimates are direct impacts - the first round of effects from direct operational expenditure on goods and services by the supply chain. The indirect production-induced (expenditure by supply chain businesses / organisations on goods and services supplied at a second level by other firms to the supply chain) and consumption-induced effects (expenditure of Industry workers' income on goods and services supplied by Australian businesses) of the supply chain were not calculated as these were considered outside the scope of the study.

Estimates are broken down by State and segment of the supply chain and are provided below. The report has not provided cross-tabulated estimates for value chain component by state, under agreement with participating organisations that provided information, in order to ensure confidentiality.

5.3 Gas Industry Supply Chain Full Time Equivalent Employees as at 30 June 2021

As at 30 June 2021 the Australian Gas Industry Supply Chain is estimated to provide 165,538 full time equivalent jobs. The main employment segments of the supply chain were in manufacturing (37,822), wholesale and retail (38,471) and electricity and gas (25,290). Western Australia (68,847) had the largest concentration of gas industry supply chain employees followed by Queensland (31,320) and Victoria (28,754).

Table 5 : Total Gas Industry Supply Chain Full Time Equivalent Employees as at 30 June 2021

State	Value Chain Component	
	FTEs	FTEs
WA	68,847	Wholesale & Retail 38,471
QLD	31,320	Manufacturing 37,822
VIC	28,754	Electricity and Gas 25,290
NSW	14,087	Transport 18,583
NT	11,008	Construction 18,320
SA	10,826	Mining 16,903
TAS	695	Professional & Technical 9,635
		Other 513
AUS	165,538	TOTAL 165,538

Source: AEAS 2021

5.4 Gas Industry Supply Chain Apprentices and Trainees

Very importantly the Australian Gas Industry Supply Chain provides an entry pathway into the workforce for 2,223 Australians in the form of apprenticeships and traineeships. The benefits to individuals who conduct an apprenticeship and traineeships accrue from improved earnings, better employment outcomes, higher mobility and higher job satisfaction after their training, compared with individuals who were not skilled. Research has consistently found that a worker with an apprenticeship can expect a wage premium of up to 44 per cent relative to a comparable un-skilled worker and are more likely to be in employment for longer.

Table 6 : Total Gas Industry Supply Chain Apprentices and Trainees as at 30 June 2021

State	Value Chain Component	
	Persons	Persons
WA	925	Electricity and Gas 536
QLD	421	Wholesale & Retail 356
VIC	386	Mining 337
NSW	189	Construction 336
NT	148	Transport 320
SA	145	Professional & Technical 191
TAS	9	Manufacturing 130
		Other 18
AUS	2,223	TOTAL 2,223

Source: AEAS 2021

5.5 Gas Industry Supply Chain Contractors

The Australian Gas Industry Supply Chain like many other industry sectors has a reliance on contractors. This practice offers a number of advantages including expertise and specialists in highly complex fields of work; flexibility in hiring for specific and individual projects; and cost and time effectiveness for supply chain companies. As at 30 June 2021 there were 23,748 contracts hired with the gas industry supply chain.

Table 7 : Total Gas Industry Supply Chain Contractors as at 30 June 2021

State	Value Chain Component	
	Persons	Persons
WA	9,877	Mining 8,657
QLD	4,493	Electricity and Gas 8,068
VIC	4,125	Wholesale & Retail 2,667
NSW	2,021	Manufacturing 2,144
NT	1,579	Construction 1,061
SA	1,553	Professional & Technical 580
TAS	100	Transport 520
		Other 51
AUS	23,748	TOTAL 23,748

Source: AEAS 2021

5.6 Gas Industry Supply Chain Wages and Salaries

The Gas Industry Supply Chain is estimated to have provided in excess of \$14.9 billion in wage and salaries to Australians in 2020-21 thereby provided a livelihood for individual and family necessities and lifestyle. The average salary provided to supply chain employees was \$90,200 and compares against Australian average annual earnings of \$67,902. In addition the gas industry supply chain is estimated to be providing each year an additional \$1.5 billion in superannuation contributions to their employees futures.

Table 8 : Total Gas Industry Supply Chain Wages and Salaries 2020-21

State	Value Chain Component	
	\$ millions	\$ millions
WA	\$6,213.6	Manufacturing \$3,428.1
QLD	\$2,826.7	Wholesale & Retail \$3,360.6
VIC	\$2,595.1	Electricity and Gas \$2,295.5
NSW	\$1,271.4	Transport \$1,683.9
NT	\$993.5	Construction \$1,660.5
SA	\$977.1	Mining \$1,594.0
TAS	\$62.7	Professional & Technical \$872.6
		Other \$45.0
AUS	\$14,940.2	TOTAL \$14,940.2

Source: AEAS 2021

5.7 Gas Industry Supply Chain Turnover

The Australian Gas Industry Supply Chain in 2020-21 had sales in excess \$64.3 billion. The largest sales segments were Mining (\$24.1 billion) and Electricity and Gas (\$17.3 billion). The largest markets were in Western Australia (\$26.8 billion), Queensland (\$12.2 billion) closely followed by Victoria (\$11.2 billion). For every \$1 million in sales in the Australian Gas Industry Supply Chain 3 jobs are created and compares to the Australian industry average of 3.2 jobs for every \$1 million in sales.

Table 9 : Total Gas Industry Supply Chain Turnover 2020-21

State	Value Chain Component	
	\$ millions	\$ millions
WA	\$26,765.0	Mining \$24,146.3
QLD	\$12,175.8	Electricity and Gas \$17,341.4
VIC	\$11,178.3	Transport \$7,072.3
NSW	\$5,476.6	Construction \$5,573.0
NT	\$4,279.6	Manufacturing \$5,097.8
SA	\$4,208.8	Professional & Technical \$2,561.8
TAS	\$270.3	Wholesale & Retail \$2,342.1
		Other \$219.7
AUS	\$64,354.3	TOTAL \$64,354.3

Source: AEAS 2021

5.8 Gas Industry Supply Chain Expenditure

The Australian Gas Industry Supply Chain expenditure (excluding labour costs) in 2020-21 was \$27.4 billion creating further economic and employment opportunities for their respective supply chain businesses. This is anticipated to create an additional 95,306 indirect jobs through indirect producer induced effects. AEAS has not included this estimate in its employment calculations in 5.3.

Table 10: Total Gas Industry Supply Chain Expenditure 2020-21

State	Value Chain Component	
	\$ millions	\$ millions
WA	\$11,400.0	Mining \$14,524.9
QLD	\$5,186.1	Transport \$3,538.2
VIC	\$4,761.2	Electricity and Gas \$2,919.7
NSW	\$2,332.6	Manufacturing \$2,863.9
NT	\$1,822.8	Construction \$1,875.2
SA	\$1,792.6	Wholesale & Retail \$1,014.9
TAS	\$115.1	Professional & Technical \$538.5
		Other \$135.3
AUS	\$27,410.5	TOTAL \$27,410.5

Source: AEAS 2021

5.9 Gas Industry Supply Chain Capital Investment

The Australian Gas Industry Supply Chain investment in its future is significant with over \$11.1 billion in capital expenditure in 2020-21. This investment primarily occurred in Mining (\$4.7 billion) and Electricity and Gas (\$2.0 billion) and in Western Australia (\$4.6 billion) and Queensland (\$2.1 billion).

Table 11: Total Gas Industry Supply Chain Capital Expenditure 2020-21

State	Value Chain Component		
	\$ millions		\$ millions
WA	\$4,639.2	Mining	\$4,724.8
QLD	\$2,110.5	Electricity and Gas	\$2,047.8
VIC	\$1,937.6	Transport	\$1,265.7
NSW	\$949.3	Construction	\$1,191.3
NT	\$741.8	Manufacturing	\$847.6
SA	\$729.5	Wholesale & Retail	\$538.7
TAS	\$46.8	Professional & Technical	\$493.2
		Other	\$45.7
AUS	\$11,154.6	TOTAL	\$11,154.6

Source: AEAS 2021

5.10 Gas Industry Supply Chain C/W, State and Local Government Taxes, Fees, Rates and Royalties

The Australian Gas Industry Supply Chain is a major provider of Commonwealth, State and Local Government Taxes, Fees, Rates and Royalties contributing \$18.1 billion in receipts to the three tiers of government providing frontline services such as hospitals, education, transport, roads and social infrastructure. Commonwealth Taxes included company tax and GST, State Taxes included payroll tax, duties, land taxes and royalties and Local Government included rates.

Table 12: Total Gas Industry Supply Chain – C/W, State and Local Government Taxes, Fees, Rates and Royalties 2020-21

State	Value Chain Component		
	\$ millions		\$ millions
WA	\$7,566.9	Wholesale & Retail	\$8,379.2
QLD	\$3,442.3	Manufacturing	\$6,782.0
VIC	\$3,160.3	Mining	\$1,356.1
NSW	\$1,548.3	Electricity and Gas	\$995.8
NT	\$1,209.9	Transport	\$458.3
SA	\$1,189.9	Construction	\$142.6
TAS	\$76.4	Professional & Technical	\$77.3
		Other	\$2.7
AUS	\$18,194.1	TOTAL	\$18,194.1

Source: AEAS 2021

5.11 Gas Industry Supply Chain Value Added

The Australian Gas Industry Supply Chain provided \$55.1 billion in direct value added to the Australian Economy. Value added for an industry is comprised of wages and salaries, gross operating surplus of business operating in the industry and indirect taxes.

It is the net contribution or value add that the industry provides to the economy. The primary means of providing this value add to the economy was through the Mining (\$11 billion) and Electricity and Gas (\$15.4 billion) segments. Western Australia (\$22.9 billion) and Queensland (\$10.4 billion) received the largest economic contributions from the gas industry supply chain.

Table 13: Industry Supply Chain Value Added 2020-21

State	Value Chain Component	
	\$ millions	\$ millions
TAS	\$231.6	Electricity and Gas \$15,417.5
SA	\$3,606.0	Mining \$10,977.6
NT	\$3,666.7	Wholesale & Retail \$9,706.4
NSW	\$4,692.2	Manufacturing \$9,015.9
VIC	\$9,577.5	Transport \$3,992.4
QLD	\$10,432.1	Construction \$3,840.4
WA	\$22,931.9	Professional & Technical \$2,100.6
		Other \$87.1
AUS	\$55,138.0	TOTAL \$55,138.0

Source: AEAS 2021

5.12 Gas Industry Supply Assets Under Management

The Australian Gas Industry Supply Chain in 2020-21 had \$265 billion in assets under management across assets including buildings, pipelines, refineries, drilling equipment, transport infrastructure, heavy and light vehicles, machinery and equipment and funds.

Table 14 : Total Gas Industry Supply Chain Assets Under Management 2020-21

State	Value Chain Component	
	\$ millions	\$ millions
WA	\$110,243.2	Electricity and Gas \$80,063.8
QLD	\$50,151.5	Mining \$41,656.1
VIC	\$46,042.9	Construction \$34,866.2
NSW	\$22,557.6	Wholesale & Retail \$32,558.7
NT	\$17,627.2	Manufacturing \$30,622.4
SA	\$17,335.7	Transport \$29,932.5
TAS	\$1,113.3	Professional & Technical \$15,263.0
		Other \$108.7
AUS	\$265,071.4	TOTAL \$265,071.4

Source: AEAS 2021

6.0 Contextualising the Gas Industry Supply Chain's Importance

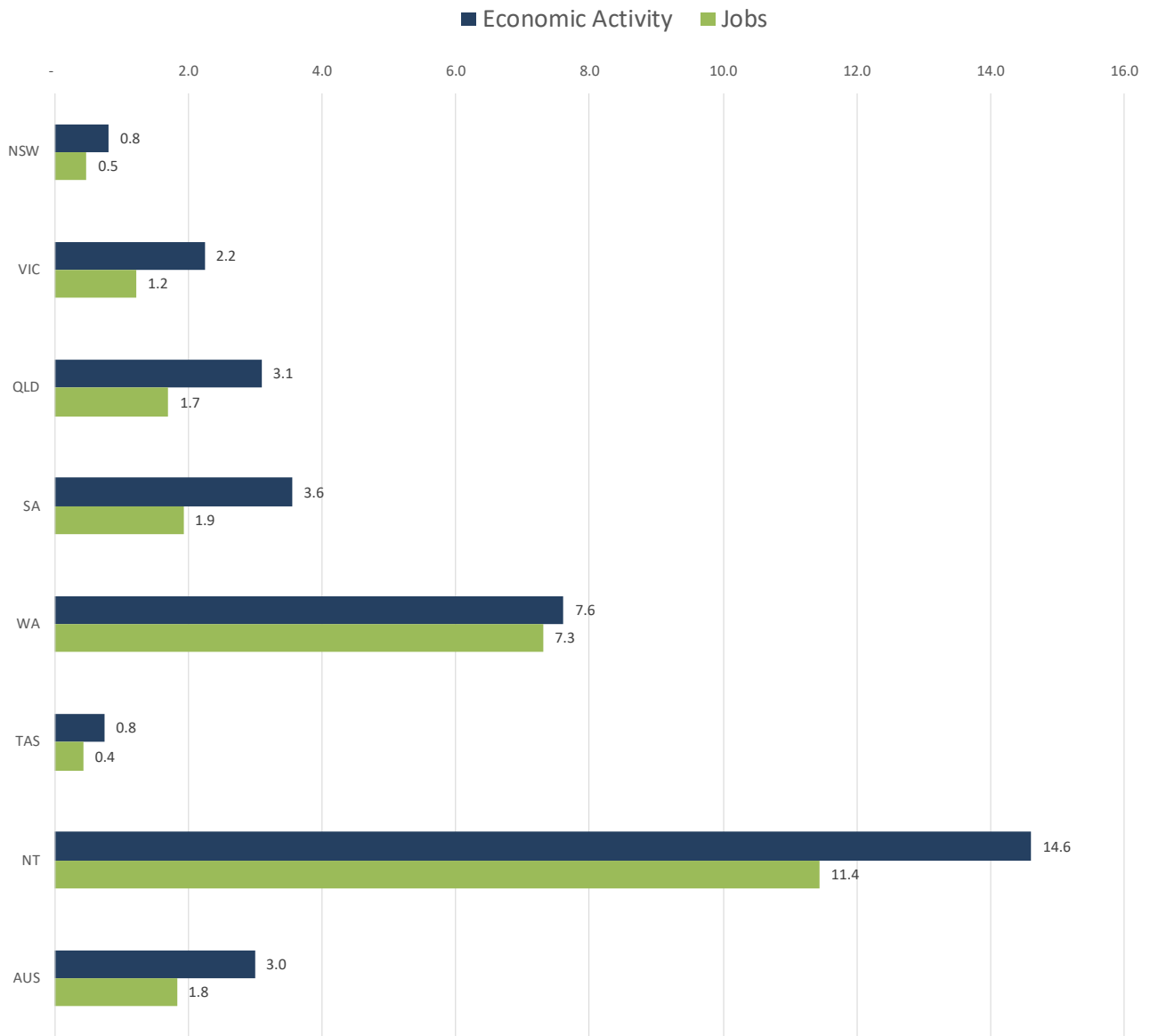
On their own the above estimates are considerable but it is important to contextualise them to establish how important the Australian Gas Industry Supply Chain is as both an economic and employment contributor.

6.1 Importance - Proportions of Total Economic and Employment

The Australian Gas Industry Supply Chain directly provides 1.8 in every 100 jobs in Australia, that is for every 54 jobs that exist in the Australian economy, the gas industry supply chain provides one of those (see figure 6). For the Northern Territory the gas industry supply chain is extremely important providing 11.4 jobs in every 100 jobs that exist and for Western Australia it is 7.3 jobs in every 100 jobs.

In addition, the Australian Gas Industry Supply Chain directly provides 3 cents in every dollar of economic activity in Australia. Again for the Northern Territory (14.6 cents) and Western Australia (7.6 cents) the gas industry supply chain is providing for a significant amount of that economic activity in that State. That is, these states have a very high reliance on the Gas industry supply chain for jobs and economic activity.

Figure 6: Gas Industry Value Chain - Jobs Created every 100 Jobs and Cents in Every Dollar of Economic Activity



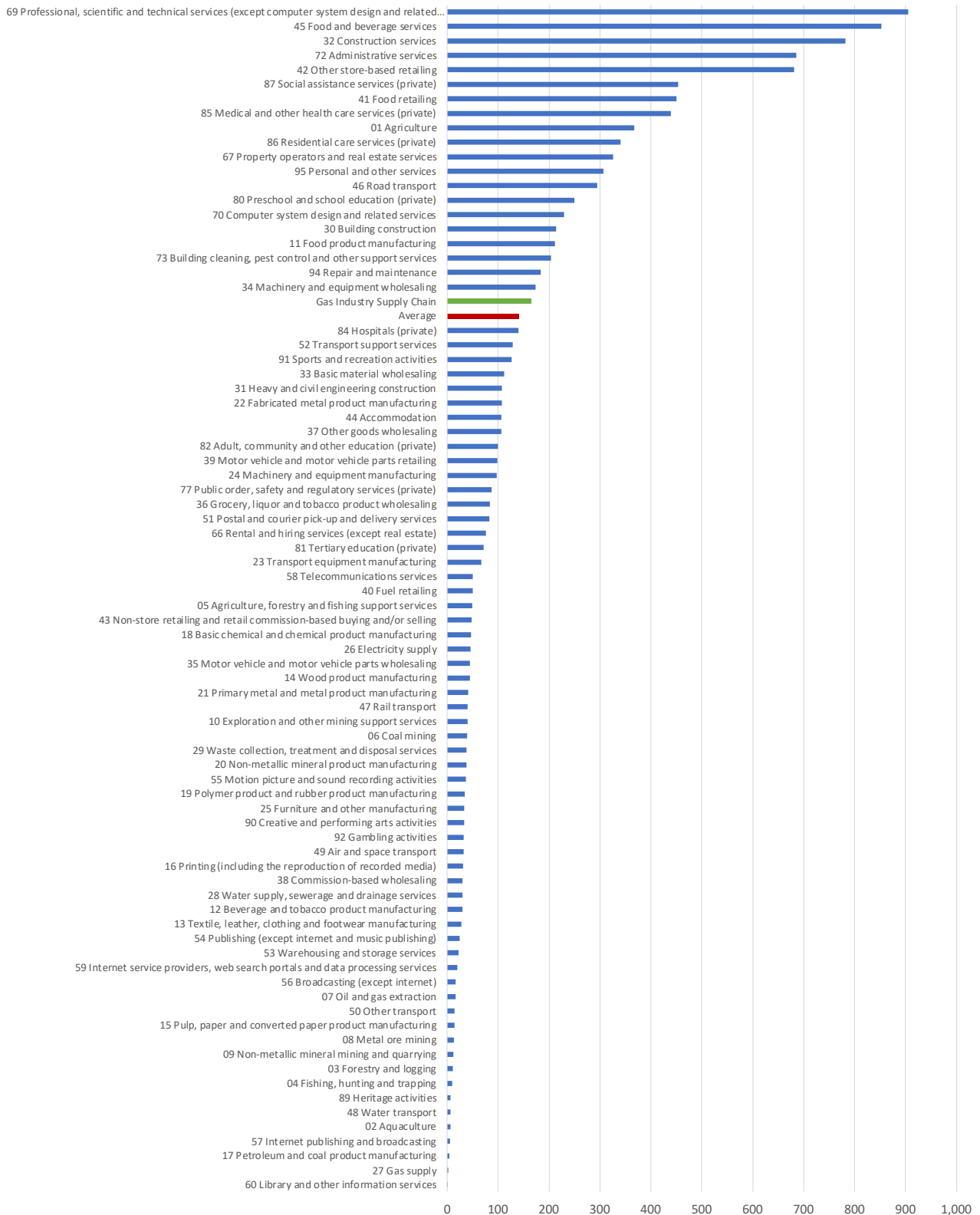
Source: AEAS and ABS Catalogues 5220.0 and 6202.0

6.2 Importance - Industry Sector Benchmarking

Further contextualising the importance of these estimates AEAS has compared the Australia Gas Industry Supply Chain compared to other industry sectors. The Australian Gas Industry Supply Chain’s 165,538 jobs places it just above the Australian industry sector average employment (140,000 persons) indicating that in relative terms it is a large and important employer (see figure 7).

This places the Australia Gas Industry Supply Chain above other industry sectors such as private hospitals, accommodation, private tertiary education and telecommunications services to name a few.

Figure 7: Industry Sector Employment (000's)

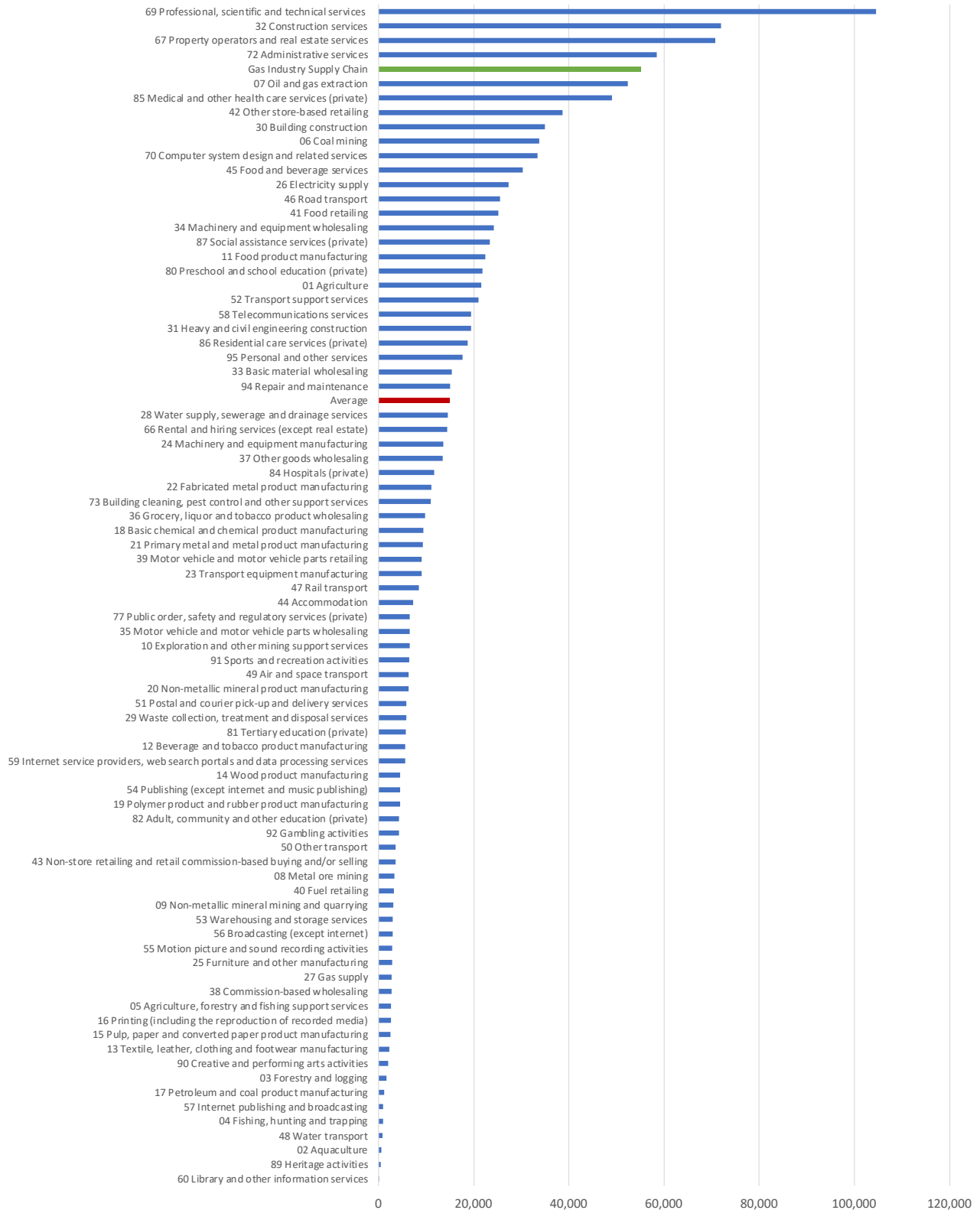


Source: AEAS and ABS Catalogue 8155.0

In respect to direct economic contribution of each industry sector, the Australia Gas Industry Supply Chain is the fifth largest industry sector in Australia - contributing \$55.1 billion and compares against the Australian industry sector average contribution of \$14.9 billion (see figure 8).

This places the gas industry supply chain above other industry sectors such as private health care, building construction, food retailing, road transport, agriculture, telecommunication services, private hospital and accommodation.

Figure 8: Industry Sector Direct Economic Contribution (\$ millions)



Source: AEAS and ABS Catalogue 8155.0

On the basis of jobs creates per 100 jobs, cents in every dollar of economic activity, comparison against over industry sector employers and other industry sector economic contributors, the Australian Gas Industry Supply Chain is of major importance to the Australian economy and community.

7.0 Economic and Employment Benefit by State

Estimates for the Gas Industry Supply Chain in each State are provided below. The general reliance of each state on gas for their energy needs as well as the supply chain for export markets generally determines the importance and contribution of the gas industry supply chain to that State. Accordingly Western Australia and Queensland have the highest contribution of the gas industry supply chain to their respective labour markets and economies.

Table 15: Gas Industry Supply Chain Human Resource Statistics – 30 June 2021

	FTEs	Apprentices and Trainees	Contractors	Wages (\$) \$ millions
WA	68,847	925	9,877	\$6,213.6
QLD	31,320	421	4,493	\$2,826.7
VIC	28,754	386	4,125	\$2,595.1
NSW	14,087	189	2,021	\$1,271.4
NT	11,008	148	1,579	\$993.5
SA	10,826	145	1,553	\$977.1
TAS	695	9	100	\$62.7
AUS	165,538	2,223	23,748	\$14,940.2

Table 16: Gas Industry Supply Chain Key Data 2020-21

	Turnover \$ millions	Expenditures \$ millions	Taxes \$ millions	Industry Value Add \$ millions
WA	\$26,765.0	\$11,400.0	\$7,566.9	\$22,931.9
QLD	\$12,175.8	\$5,186.1	\$3,442.3	\$10,432.1
VIC	\$11,178.3	\$4,761.2	\$3,160.3	\$9,577.5
NSW	\$5,476.6	\$2,332.6	\$1,548.3	\$4,692.2
NT	\$4,279.6	\$1,822.8	\$1,209.9	\$3,666.7
SA	\$4,208.8	\$1,792.6	\$1,189.9	\$3,606.0
TAS	\$270.3	\$115.1	\$76.4	\$231.6
AUS	\$64,354.3	\$27,410.5	\$18,194.1	\$55,138.0

Table 17: Gas Industry Supply Chain Investment and Assets 2020-21

	Capital Expenditure \$ millions	Assets Under Management \$ millions
WA	\$4,639.2	\$110,243.2
QLD	\$2,110.5	\$50,151.5
VIC	\$1,937.6	\$46,042.9
NSW	\$949.3	\$22,557.6
NT	\$741.8	\$17,627.2
SA	\$729.5	\$17,335.7
TAS	\$46.8	\$1,113.3
AUS	\$11,154.6	\$265,071.4

Source: AEAS 2021

8.0 Economic and Employment Benefit by Supply Chain Component

Estimates for each of the segments of the gas industry supply chain in are provided below. Wholesale and Retail and Manufacturing are the two largest segments of the gas industry supply chain when it comes to number of employees, apprentices and trainees, contractors and wages paid to employees. However, Mining and Electricity and Gas are easily the two largest segments in respect to turnover, industry value added and assets under management. These two segments are also the largest providers of taxes, rates and royalties to the three tiers of government in Australia.

Table 18: Gas Industry Supply Chain Human Resource Statistics – 30 June 2021

	FTEs	Apprentices and Trainees	Contractors	Wages \$ millions
Wholesale & Retail	38,471	356	2,667	\$3,360.6
Manufacturing	37,822	130	2,144	\$3,428.1
Electricity and Gas	25,290	536	8,068	\$2,295.5
Transport	18,583	320	520	\$1,683.9
Construction	18,320	336	1,061	\$1,660.5
Mining	16,903	337	8,657	\$1,594.0
Professional & Technical	9,635	191	580	\$872.6
Other	513	18	51	\$45.0
TOTAL	165,538	2,223	23,748	\$14,940.2

Table 19: Gas Industry Supply Chain Key Data 2020-21

	Turnover \$ millions	Expenditures \$ millions	Taxes \$ millions	Industry Value Add \$ millions
Mining	\$24,146.3	\$14,524.9	\$1,356.1	\$10,977.6
Electricity and Gas	\$17,341.4	\$2,919.7	\$995.8	\$15,417.5
Transport	\$7,072.3	\$3,538.2	\$458.3	\$3,992.4
Construction	\$5,573.0	\$1,875.2	\$142.6	\$3,840.4
Manufacturing	\$5,097.8	\$2,863.9	\$6,782.0	\$9,015.9
Professional & Technical	\$2,561.8	\$538.5	\$77.3	\$2,100.6
Wholesale & Retail	\$2,342.1	\$1,014.9	\$8,379.2	\$9,706.4
Other	\$219.7	\$135.3	\$2.7	\$87.1
TOTAL	\$64,354.3	\$27,410.5	\$18,194.1	\$55,138.0

Table 20: Gas Industry Supply Chain Investment and Assets 2020-21

	Capital Expenditure \$ millions	Assets Under Management \$ millions
Mining	\$4,724.8	\$41,656.1
Electricity and Gas	\$2,047.8	\$80,063.8
Transport	\$1,265.7	\$29,932.5
Construction	\$1,191.3	\$34,866.2
Manufacturing	\$847.6	\$30,622.4
Wholesale & Retail	\$538.7	\$32,558.7
Professional & Technical	\$493.2	\$15,263.0
Other	\$45.7	\$108.7
TOTAL	\$11,154.6	\$265,071.4

Source: AEAS 2021

Appendix One: Mapping of Gas Industry Supply Chain

Mining

- Gas, natural, extraction
- Natural gas extraction
- Petroleum gas extraction
- Gas Exploration
- Other Mining Support Services – including Cementing oil and gas well castings; Directional drilling and re-drilling; Mining draining and pumping service; Oil and gas field support service

Wholesale and Retail Trade

- Liquefied petroleum gas (LPG) (in bulk or in containers)
- Commercial Vehicle
- Gas plumbing and fittings
- Gas appliance retailing – including stoves, BBQ's, heating, fridges, airconditioner & compressors etc

Manufacturing

- Gas oil manufacturing
- Liquefied petroleum gas (LPG) manufacturing
- Industrial Gas Manufacturing including liquefied natural gas and hydrogen
- Pipe fittings, manufacturing
- Gas cylinder manufacturing
- Gas fittings and meter manufacturing
- Truck manufacturing
- Machinery and Equipment manufacturing
- Gas appliance manufacturing – including stoves, BBQ's, heating, fridges, airconditioner & compressors etc
- Gas compressor manufacturing
- Gas cutting and welding equipment manufacturing

Transport, Postal and Warehousing

- Road Freight including bulk gas
- Rail Freight including bulk gas
- Shipping Freight including bulk gas
- Pipeline operations

Electricity, Gas, Water and Waste Services

- Gas Supply - including Coal gas distribution through mains system; Fuel gas distribution through mains system; Liquefied petroleum gas distribution through mains system; Liquefied petroleum gas reforming for distribution through mains system; and Natural gas distribution through mains system
- Electricity Generation using mineral gas
- Other Electricity Generation including biofuels
- Electricity Transmission and Distribution
- Electricity Retailing

Professional, Scientific and Technical Services

- Scientific Research Services
- Engineering Design and Engineering Consulting Services – including architectural, surveying; Engineering design and consulting
- Legal and Accounting Services
- Advertising Services
- Management and consulting services
- Computer System Design and Related Services
- Communication Services
- Banking and Insurance Services
- Employment Services - including placement; recruitment and labour supply

Construction

- Non-Residential Building Construction eg buildings
- Pipeline construction
- Heavy and Civil Engineering Construction – non pipeline
- Gas plumbing – residential and non-residential

Other Services

- Automotive Repair and Maintenance
- Machinery and Equipment Repair and Maintenance

Appendix Two: Methodology

In order to assist in AGIT advocating effectively on behalf of the Industry, AEAS was commissioned to analyse the importance of the Australian Gas Industry Supply Chain to employment and the economy.

AEAS estimates were developed through an electronic Industry 'Census' questionnaire circulated by AGIT for completion by members of organisations including:

- Australian Pipelines and Gas Association;
- Australian Petroleum Production & Exploration Association;
- Energy Networks Australia;
- Gas Appliance Manufacturers Association of Australia; and
- Gas Energy Australia.

Through this process credible and actual data on the direct employment and economic contribution of the supply chain across were obtained and calculated for the following areas:

- The contribution the supply chain makes to Australian GDP and State GSP in industry value add;
- The number of direct jobs created by the supply chain;
- The value of wages and salaries paid by the supply chain;
- Level of investments made in Australia by the supply chain;
- The value of Commonwealth, State and Local Government taxes, royalties and rates contributed by the supply chain; and
- Total assets held by the supply chain in Australia.

All estimates are direct impacts - the first round of effects from direct operational expenditure on goods and services by the supply chain. The indirect production-induced (expenditure by supply chain businesses / organisations on goods and services supplied at a second level by other firms to the supply chain) and consumption-induced effects (expenditure of Industry workers' income on goods and services supplied by Australian businesses) of the supply chain were not calculated as these were considered outside the purpose of the study. That is the report seeks to solely capture the direct employment and economic contribution.

Estimates are broken down by State and segment of the supply chain and are provided below.

- New South Wales
- Victoria
- Queensland
- South Australia
- Western Australia
- Tasmania
- Northern Territory
- Australia

- Mining
- Manufacturing
- Electricity and Gas
- Construction
- Wholesale & Retail
- Transport
- Professional & Technical
- Other Services

Analysis was underpinned by data from the Australian Bureau of Statistics, Australian Energy Statistics 2021 Energy Update Report, online workshops with AGIT, APGA, APPEA, ENA, GAMAA and GEA and subsequent materials provided by these organisations.

This report merges the provided information, workshop content, economic analysis, literature research.

Appendix Three: References

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Appendix Four: AEAS Business Information

Australian Economic Advocacy Solutions delivers services in economic analysis, research and advocacy in Australia and was set up by Nick Behrens following two decades of experience applying these skills in the real world for Australia's business community. More specifically AEAS provides:

- Economic Contribution and Valuation Analysis;
- Data Analysis, Market research and Economic Modelling;
- Stakeholder Consultation; and
- Government Relations and Submissions.

AEAS delivers services nationally to exemplary organisations including Australian Industry Group, Australian Gas Industry Trust, BASF, Brisbane Airport Corporation, CCIQ, Canegrowers, IOR Petroleum, LifeFlight, Master Builders Australia, Natroads, Port of Brisbane, Property Council of Australia, Queensland Resources Council, RACQ, Remondis, Suncorp, VTA, Victorian Waste Management Association, unions, local government authorities, the Commonwealth and State Governments and many others.

We can be engaged for either a special project (for the entire project or just the parts our clients need help with) or on an ongoing basis. We will take the time to understand your unique challenge and create a partnership with you to tailor a solution specific to your budget. We engage with confidentiality and integrity. Choose AEAS for our expertise, professionalism and ability to work with our valued clients to achieve exceptional results.

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Across his professional career Nick has realised many outstanding outcomes to complex challenges for the business community. He possesses significant experience in gathering and presenting information, and leveraging that information to achieve results across a range of areas including economic, taxation, regulatory environment, workers compensation, employment legislation, population, infrastructure and planning issues. As Director of Australian Economic Advocacy Solutions (AEAS), Nick provides:

- Exceptional understanding of social, political and economic issues impacting on business and the economy;
- Considerable real-world application of project, business and economic research and analysis;
- Significant expertise in advocacy, including government and stakeholder relations;
- In-depth and firsthand knowledge of the workings of Government;
- Extensive networks in political, government, business and community sectors;
- Previous appointments on a number of high level Government committees; and
- Media commentator and public speaker.

Nick's representations are based on extensive research and his preferred approach to economic analysis, research and advocacy is to achieve results by working with stakeholders behind the scenes to secure positive and lasting outcomes. He places much emphasis on having a thorough and convincing evidence that is readily understood and in turn leads to real world application and solutions.

