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The Gas Supply Chain

Most natural gas is delivered to industrial, commercial and residential consumers through a supply chain involving: production, transmission, distribution and retailing.

Upstream (“Production”)

The ‘upstream’ natural gas production industry includes the exploration for and extraction of raw natural gas from petroleum reservoirs and, increasingly in Australia, coal seams. The raw gas is then processed either into pipeline quality natural gas for the domestic market or LNG for export. The ‘Producers’ typically sell the gas to user parties at this point.

Midstream (“Transmission”)

The ‘midstream’ gas transmission sector transports processed natural gas on behalf of the user parties through high pressure pipelines from the processing facilities to the ‘city gate’ (entry point to the distribution system) or major manufacturing or power generation customers. The pipelines typically have high operating pressure (typically 10,000 to 15,000 kPa) to optimise shipping capacity and as gas is compressible they are storage vessels as well as modes of transport. Gas pipelines are buried in ‘easements’ to prevent damage that could create safety issues or disrupt gas

supplies. In total, Australia’s gas transmission pipeline network is currently about 25,000km.

Considerable effort is devoted to ensuring gas transmission pipelines are safe, reliable and efficient; ensuring that supply is not disrupted. The Australian gas transmission industry sets a world benchmark for safety and undertakes considerable and wide ranging research. The industry-developed standard AS2885 is respected internationally and by other Australian industry sectors as a high-quality standard for the design, maintenance and operation of high pressure energy transmission pipelines.

Downstream (“Distribution” and “Retail”)

The gas distribution and retail sectors are the ‘downstream’ component of the gas supply industry. The gas distribution sector operates the lower pressure gas network (typically at pressures lower than [1000kPa]), transporting gas from city gate delivery stations to homes, offices and factories. There are currently over 80,000km of gas network pipelines in Australia. The gas retail sector then sells the delivered gas to end use customers.

Users of Gas

At a national level, natural gas consumption is dominated by the electricity generation and manufacturing sectors, as shown below, however, consumption varies widely between states:

Primary natural gas consumption by sector, 2007/08

Sector	Share of natural gas consumption
Electricity generation	31.1%
Manufacturing	27.8%
Mining	19.5%
Residential	11.2%
Commercial	3.6%
Other	6.8%

Price of Gas

Retail Price

Retail gas prices vary substantially between states. These variations result from a range of factors, including distance from sources and usage patterns. For example, an average residential user in Victoria annually consumes more than three times the gas consumed by an average Queensland residential user, while an average residential user in Perth is over 1500km away from the main sources of gas in that State. As a result, prices vary from around \$15.50/GJ in Melbourne to almost \$28/GJ in Brisbane¹.

Nevertheless, the components of the final retail price are relatively similar across States, with the four components of price relating to the separate sectors of the gas supply industry:

1. **Production.** The price component to produce the gas, which must cover the costs of exploration, development gathering and processing and accounts for 11-21% of the final retail price.
2. **Transmission.** The price component to transport the gas through high pressure transmission pipelines from the source to the market accounts for 2-7% of the final residential price.
3. **Distribution.** The price component to distribute the gas to consumers through low pressure distribution pipelines is significant, as a large infrastructure network is required to service each consumer. As a result, this component accounts for 38-58% of the final retail price.
4. **Retailing.** The price component to retail the gas, including marketing, customer service and revenue collection accounts for around 30% of the final retail price.

Manufacturing & Power Generation Price

The electricity, manufacturing and mining sectors typically do not require the services of natural gas distributors or retailers and, with their substantial volumes, pay significantly lower prices per unit for natural gas than do residential customers. Larger users will typically negotiate directly with producers to purchase gas, and then negotiate with a transmission pipeline for delivery of the gas. As the unit prices are lower for large users, transmission charges account for a higher portion of the price.

¹ ACIL Tasman, AER State of Energy Markets 2008

Observations regarding the gas supply chain

- The various components of the gas supply chain are distinct sectors that typically have specialist operators, different regulatory environments and legislation and unique issues.
- The distribution and retail sectors of the gas supply chain typically apply to residential and small commercial users. Depending on their geographic location, large users typically only deal with the production and transmission sectors. Economic regulation does not impact the gas supply chain evenly, with some transmission pipelines subject to regulation, whereas all distribution and most retail prices are subject to regulation. Production prices are not subject to regulation.
- The wholesale price of gas is subject to negotiation with the gas producers and may be different for each user. Wholesale gas price information is not made publicly available other than in Victoria with its unique infrastructure and 'market' carriage system.



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