Queensland gas industry primer

Chapter 02

In this chapter we cover:

- Queensland petroleum and gas overview
- Key gas facts
- Regulatory focus
- Queensland petroleum and gas policy

Current as of April 2019
Queensland petroleum & gas overview

The Surat and Bowen basins in southern and central Queensland respectively are a current focus for petroleum and gas exploration and production. Both regions are supported by pipeline and transport infrastructure.

Coal seam gas (CSG) from the Bowen and Surat basins represents 95% of the State’s total gas production. Many of Queensland’s known petroleum or coal basins also host potential shale gas, tight gas or CSG resources. These could include Laura, Maryborough, Eromanga, Cooper, Galilee, Adavale, Georgina, Millungera and the Isa Super basins.

Outside producing and known petroleum and gas basins on this map, many areas remain largely under-explored. The recent construction of a pipeline from Tennant Creek in the Northern Territory to a fertiliser plant south of Mount Isa is indicative of the demand for new gas supply in Queensland.

**DID YOU KNOW?** In ‘conventional’ geology, gas is found with other petroleum products such as oil. Coal seam gas (CSG) is released from cleats and fractures in coal. While location and production methods vary, the same gas product is produced by conventional and CSG fields.

**LANDHOLDER TIP:** Unless stated otherwise, the term ‘gas’ refers to natural gas, a naturally occurring hydrocarbon gas mixture consisting primarily of methane (CH₄).
**Key gas facts**

| 01 | Today, Australia’s $28 billion per year petroleum and gas industry contributes 58% of Australia’s primary energy, 2.5% of Australia’s gross domestic product, and almost $9 billion in direct tax payments. |
| 02 | Future CSG and shale developments are likely to see these numbers continue to increase. |
| 03 | Australia’s gas supply is growing in response to new technology that allows production from resources that were too difficult to access until recently. |
| 04 | Aside from shale gas, Australia has an estimated 819 trillion cubic feet (tcf) of known gas resources, which is sufficient to power a city of one million people for 16,000 years. |
| 05 | Australia’s first shale gas well was drilled in the Cooper Basin in 2012, but commercial production is yet to be achieved. |
| 06 | Petroleum and gas industry terms ‘conventional’ and ‘unconventional’ define the reservoir structure, not the physical properties of the gas itself. |
| 07 | An Australian Council of Learned Academies (ACOLA) report in 2013 found that Australia could have more than 1000 tcf in recoverable shale gas with Western Queensland among the more promising precincts. |

**DID YOU KNOW?** Liquefied petroleum gas (LPG) is a mix of propane and butane stored and transported in metal canisters (bottles) as a liquid. LPG is a by-product of conventional petroleum production and oil refining. Its most common use is as a fuel for barbeques and stoves.

Source: APPEA, 2018
The difference

Conventional gas well

- Well casing
- Confining layer
- Conventional gas reservoir

Typically up to 3000m deep

Unconventional (CSG) gas well

- Well casing
- Confining layer
- Coal seam
- Confining layer

Gas & water separator

Typically 200m to 1000m deep
‘By failing to prepare, you are preparing to fail.’

- Benjamin Franklin
Queensland’s sedimentary basins with gas resources

DID YOU KNOW? Natural gas for long-distance export is chilled to -161°C, at which temperature it becomes a liquid. Liquefied Natural Gas (LNG) occupies 1/600 of the space it does as a gas. Large volumes of LNG can be exported in purpose-built tanker ships and re-gasified on delivery.
Case study

BENEFICIAL USE OF WATER ON ARROW ENERGY’S THETEN FARM

Theten is a mixed cropping and grazing farm on rich agricultural land owned by Arrow Energy.

Arrow Energy uses Theten primarily as a research centre to test techniques and technologies that allow the agricultural and coal seam gas industries to coexist.

The farm has successfully grown chick peas, wheat, sorghum, corn, canola, barley, cotton and mungbeans under irrigation using treated coal seam water sourced from Arrow’s nearby Daandine wells – a first for the industry in the Western Downs.

Case study

A ROMA SUCCESS

Peter Sharpe decided to go into business in 1995 and apply his knowledge and experience built up during a successful career in the oil and gas industry.

He started the business on his own, confident that the gas industry was about to take off in the Roma area and the gas companies would be crying out for engineering support.

After a decade establishing the company’s basic capabilities, Peter employed a salesperson in a Business Development role and spent months building up relationships with the gas companies rather than just pushing them for sales.

By building a good reputation first, the business came to him.

Peter now employs 67 staff over 3 locations – Roma, Chinchilla and Brisbane along with a very substantial investment of plant and equipment.

That makes Sharpe Engineering one of the biggest employers in Roma and a success story that continues to grow.

Peter recognises gas and agriculture as being the main drivers for the region and says, “You can’t really have one without the other or the economy will suffer”.

“You can’t really have one without the other or the economy will suffer”

– Peter Sharpe, Sharpe Engineering
State government policy

Petroleum and gas are important economic contributors to Queensland and a key driver of economic growth and job creation in regional Queensland.

A comprehensive governance framework guides the sustainable development of Queensland’s onshore petroleum and gas resources, notably in relation to large-scale CSG extraction and an associated liquefied natural gas (LNG) export industry.

The laws are designed to protect rural landholders, communities and the environment while encouraging a sustainable petroleum and gas industry through:

- Detailed assessments of proposed projects
- Protection of the Great Artesian Basin, local water supplies and areas of regional interest
- Provision of fair conditions and compensation for affected landholders
- Ensuring petroleum and gas development is safe and sustainable
- Establishing a strict compliance and enforcement regime

The Department of Natural Resources, Mines and Energy (DNRME) offers a range of engagement, compliance, tenure management, gas safety, technical and geoscientific services provided by staff located throughout Queensland.

DNRME’s specialist offices include a dedicated Engagement and Compliance Unit and the Petroleum and Gas Inspectorate.

Other agencies and organisations contributing to the sustainability of the petroleum and gas industry in Queensland include:

- Department of Environment and Science
- Department of State Development, Manufacturing, Infrastructure and Planning
- Department of Agriculture and Fisheries
- Office of Groundwater Impact Assessment (OGIA)
- CSIRO’s Gas Industry Social and Environmental Research Alliance (GISERA)
- The University of Queensland’s Centre for Coal Seam Gas
- Office of the Queensland Chief Scientist.

**LANDHOLDER TIP:** A resource company must obtain the appropriate resource authority before any exploration or production activity is conducted.

Authorities are issued under the *Petroleum and Gas (Production and Safety) Act 2004* for:

**Exploration** – an authority to prospect (ATP) is granted to allow a resource company to explore for petroleum and gas. A potential commercial area (PCA) may be granted to allow additional time to explore areas that show some potential but still require further exploration.

**Production** – a petroleum lease (PL) is granted once exploration activities have been completed and a commercial petroleum and gas resource is known to exist.

**Infrastructure development** – petroleum facility license (PFL), petroleum pipeline license (PPL).

**Information gathering without an ATP or PL** – petroleum survey license (PSL), water monitoring authority (WMA) and data acquisition authority (DAA).
The regulatory framework

A REGULATORY FRAMEWORK COVERS THE FULL LIFECYCLE OF THE ONSHORE PETROLEUM AND GAS INDUSTRY IN QUEENSLAND FROM EXPLORATION TO PRODUCTION AND REHABILITATION.

Below is a list of the key legislation included in the framework. More details on how these contribute to the regulation of the petroleum and gas industry can be found on respective department websites or by visiting the GasFields Commission website.

www.gasfieldscommissionqld.org.au

Biosecurity Act 2014
Environment Protection Act 1994
Environmental Offsets Act 2014
Forestry Act 1959
Nature Conservation Act 1992

Petroleum and Gas (Production and Safety) Act 2004
Regional Planning Interests Act 2014

State Development and Public Works Organisation Act 1971
Waste Reduction and Recycling Act 2011
Water Act 2000
Water Reform and Other Legislation Amendment Act 2014
Petroleum Act 1923

Department of Agriculture & Fisheries
Department of Environment & Science
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Department of Environment & Science
Department of Natural Resources, Mines & Energy
Department of Natural Resources, Mines & Energy
Department of State Development, Manufacturing, Infrastructure & Planning
Department of State Development, Manufacturing, Infrastructure & Planning
Department of Environment & Science
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OTHER QUEENSLAND LEGISLATION
• Fisheries Act 1994
• Aboriginal Cultural Heritage Act 2003
• Queensland Heritage Act 1992
• Public Health Act 2005
• Transport Operations (Road Use Management) Act 1995
• Planning Act 2016

FEDERAL LEGISLATION
• Environment Protection and Biodiversity Conservation Act 1999
• Water Act 2007
• Native Title Act 1993
• Industrial Chemicals (Notification and Assessment) Act 1989
• Corporations Act 2001
• Australian Securities and Investments Commission Act 2001
• Fair Work Act 2009
“When both industries are operating together, which they are, it makes for a very strong economy within a region.”

– Peter Sharpe, Sharpe Engineering