



SHARED LANDSCAPES

INDUSTRY TRENDS

Shared Landscapes captures the key trends and footprint of two industries sharing the regional Queensland landscape – agriculture and gas.

Acknowledgments

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Technical experts:

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- Office of the Land Access Ombudsman
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- Queensland Resources Council
- Queensland Treasury
- Resources Safety & Health Queensland
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The GasFields Commission Queensland
PO Box 15266 City East QLD 4002

Phone: +61 7 3067 9400

Email: enquiries@gfcq.org.au

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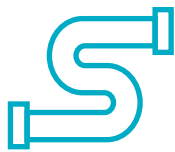
01

INTRODUCTION AND OVERVIEW



1900

Gas is first discovered by chance in Roma from a well being drilled for water



1968

Gas is piped to Brisbane via the Wallumbilla to Brisbane gas pipeline



1996

Commercial production of coal seam gas (CSG) commences in the Bowen Basin



2015

Liquefied natural gas (LNG) is exported from Gladstone

WHAT DOES 'SHARED LANDSCAPES' REPRESENT?

The concept of the Shared Landscapes report was born in part from the Commission's [statutory function](#) to obtain and publish information that can assist landholders and regional communities to increase their knowledge and understanding of Queensland's onshore gas industry.

The agricultural and resources sectors are two of the many contributors to the prosperity of Queensland's rural and regional communities and the State as a whole. This report acknowledges that while there are many different factors that relate to the prosperity of regional communities, the focus is the interrelationship between the agricultural and resources sectors.

Maintaining the social licence of Queensland's onshore gas industry and achieving sustainable coexistence with rural landholders and regional communities is essential for the industry's continued growth and prosperity. As Queensland's onshore gas industry continues to expand, it is important that trust, transparency, respectful communication and information sharing is facilitated between all stakeholders.

This Shared Landscapes report is the third comprehensive report that the Commission has produced since 2019. This iteration of Shared Landscapes encapsulates the current state of Queensland's petroleum and gas industry for the Financial Year ending in June 2021 (FY21). The purpose of the report is to define the current state of the petroleum and gas industry, including development areas, groundwater management processes, compliance and the economic contributions made to regional communities and the State. In FY21, Queensland's petroleum and gas industry spent over \$3.5 billion with Queensland based suppliers of goods and services, communities, and government payments, which also supported over 4,000 directly employed jobs.

This report also includes the compilation of data that demonstrates the joint economic contribution that both the agriculture sector and the gas industry deliver to the Queensland economy. The purpose of this additional information is not as a comparison, rather to

demonstrate how important the agriculture sector and the gas industry is to the entire Queensland economy. The ability for this economic contribution to be realised relies in part on the successful coexistence of the gas industry and the agricultural sector operating on the same land at the same time. This symbiotic relationship between rural landholders, regional communities and the onshore gas industry has developed over the past few decades and will continue for years to come. That is why coexistence between these two sectors is critical.

This report will describe the benefits and contributions that the petroleum industry provides to Queensland. It will explore further how the petroleum industry and agriculture sector can operate side by side and deliver benefits to landholders, regional communities, and all Queenslanders. The report is underpinned by facts and data obtained from government agencies, the petroleum and gas industry and industry representative bodies to provide accurate and meaningful information to stakeholders in regional communities, rural landholders and other interested groups.

QUEENSLAND'S ONSHORE GAS INDUSTRY

The onshore gas industry has been a part of Queensland's landscape since the first natural gas field was discovered by accident in Roma in 1900, with natural gas rising from a well that was being drilled for water. Queensland's first commercial petroleum and gas operations were developed in the 1960s in the Cooper Basin and Moonie oil fields.

The [conventional gas](#) industry has matured since the 1960s, with productive oil and gas fields in the Cooper Basin and around Moonie in the Surat. During the 1990's, as those gas reserves were depleting, the discovery of coal seam gas (CSG) reserves in the Surat Basin led to the growth of a new gas industry in Queensland.

Until the 2000s, gas had traditionally been developed in Queensland for use in the domestic East Coast Market. The discovery of significant CSG reserves and resources in the Surat Basin and the Bowen Basin led to the viability of exporting gas overseas to high value energy markets in Asia.

To achieve this vision required a significant undertaking and resulted in the development of a world first to convert CSG to liquid natural gas (LNG) for export.

The concept of converting CSG to LNG was realised in 2014 with the first export cargo from the Curtis Island LNG facilities. This shipment marked a world first of converting CSG into LNG, launching Queensland gas resources into global export markets.

The ability to convert CSG to LNG underpinned the commercial investments required to develop the CSG resources in Queensland. To continue to supply the export and domestic markets for decades to come, there is a need to discover and develop new gas reserves.

Gas exploration continues to be undertaken in new and emerging areas as well as targets in traditional fields like the Cooper Basin, the Surat Basin and Bowen Basin. These traditional areas are being explored for deeper and harder to reach targets such as basin-centred and tight gas in sandstones. As well as new targets in traditional areas, gas exploration is occurring in areas that have not yet seen significant gas activity such as the Galilee Basin and Adavale Basin.

In addition, frontier basins such as South Nicholson Basin and the Millungera Basin are in the early stages of potential exploration activities.

The ability to discover and liberate these emerging gas resources may require the deployment of new technology, new practices, new techniques and utilising innovative approaches. Some of these techniques include practices already used in Queensland such as deviated and directional drilling, hydraulic fracturing and artificial intelligence learning to reprocess existing data.

In the early days of the CSG to LNG sector in Queensland, the agricultural producers in the Surat Basin and Bowen Basin held serious concerns regarding the gas industry's surface impacts on established farming operations.

This included potential impacts to groundwater aquifers, as well as social and economic challenges.

Today, a large portion of landholder and community concerns center around CSG activities in high-value agricultural areas which are predominantly crop farming operations.

By improving management of surface impact, the gas industry has undoubtedly delivered benefits to the communities that host gas activity as well as the State of Queensland as a whole. These benefits include the opportunity for economic diversity in Local Government Areas (LGAs), direct contributions from gas companies to local sporting and community groups, procurement of goods and services in regional areas and the payment of royalties to the Queensland Government.

Gas is a critical contributor and creator of direct jobs, not only boosting Queensland's economy, but the positive flow-on effects are evident in the indirect jobs it enables downstream in the energy and manufacturing sectors.

Australia's manufacturing sector needs gas to operate and that's why it's so important there is a guarantee that they have a ready gas supply.

Similarly, gas is also needed as a vital energy source for power generation as well as for household use, primarily in cooking and heating (particularly in the colder southern states).

Gas production—both domestically and for export—will continue to be an essential part of Queensland's economy for the foreseeable future, and sound coexistence practices with rural and regional communities will be key to its delivery.

GASFIELDS COMMISSION QUEENSLAND

The GasFields Commission Queensland (the Commission) is an independent statutory body established by the Queensland Government in 2012 to manage and improve the sustainable coexistence of landholders, regional communities, and Queensland's onshore gas industry.

The Commission provides a range of support to landholders and regional communities, primarily through education and engagement activities.

It plays a key role in delivering information to landholders to help them understand their rights as they relate to gas development, along with advising government and other key stakeholders on issues of concern and opportunities.

The Commission also works to provide transparency and independent assurances that the onshore gas industry is being appropriately regulated and held to account when needed.

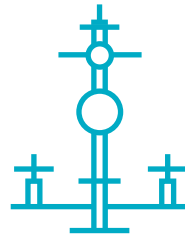


02 INFRASTRUCTURE AND ACTIVITIES



173M

hectares (ha) is the **total land area** of Queensland



16,499

As of June 2021, total of **16,499 CSG and petroleum wells** had been drilled in Queensland



10,986

CSG wells that are currently in production



3.5M ha

of Queensland is currently **under granted petroleum lease (PL)**



702 water bores

in the CMA are predicted to be impaired over the life of the CSG industry



108 IAA water bores

likely to be impacted between 2021 and 2024



5,036

Conduct and Compensation Agreements (CCA) were in place at the end of FY21, with more than **\$807 million** paid in total cumulative compensation



12,437 km

of **petroleum pipeline licences (PPLs)** that have been constructed and in operation



Make Good Agreements have been successfully negotiated for

135 of the IAA bores

Table 1: Land area under petroleum and gas tenures (as of 30 June 2021)

Tenure type and status	Area (ha)	Area (km ²)	% of Queensland Area
ATP granted	11,454,510	114,545	6.6%
ATP application	4,529,758	45,298	2.6%
PL granted	3,476,265	34,763	2.0%
PL application	843,396	8,434	0.5%
Total granted ATP and PL*	14,930,775	149,308	8.6%

* Total granted tenure area less than sum due to overlapping [application] tenures

Source: Department of Resources (This dataset captures all permit applications lodged with the department and permit grant decisions by the department to 30 June 2021)

Generally, exploration is far more widespread than production. There has been an increasing trend in exploration over the last 12 years, particularly in Banana, Central Highlands, Maranoa, Western Downs and Isaac LGA, with a sharp rise in Toowoomba since FY19. The sharp increase in Toowoomba can be attributed to the increase in activity associated with commencement of the Surat Gas Project. Baloon, Barcoo, Condiwindi and Quilpie showed no increase.

Table 2. The area of an LGA in percent covered by GRANTED petroleum lease (PL) tenures in Queensland for the period 1 July 2010 to 30 June 2021

LGA	LGA area (ha)	FY10	FY11	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20	FY21
Balonne Shire	3,107,494	1.5%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.8%	1.5%	1.5%
Banana Shire	2,854,864	5.7%	5.7%	5.7%	5.7%	6.2%	7.2%	7.5%	7.5%	7.5%	7.5%	8.2%	8.8%
Barcoo Shire	6,225,640	0.3%	0.3%	0.3%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%	0.4%
Bulloo Shire	7,323,489	6.6%	6.6%	6.6%	6.6%	6.6%	6.7%	6.7%	6.7%	6.7%	6.8%	6.8%	6.8%
Central Highlands Regional	5,983,558	2.1%	2.1%	2.1%	2.1%	2.1%	2.5%	2.5%	2.5%	3.0%	3.0%	3.8%	3.8%
Condiwindi Regional	1,928,080	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%
Isaac Regional	8,260,621	0.6%	0.6%	0.6%	0.6%	0.6%	0.7%	0.7%	0.7%	0.7%	0.9%	0.9%	0.9%
Maranoa Regional	5,871,000	12.7%	13.0%	13.1%	13.4%	13.3%	13.3%	13.7%	13.7%	15.9%	15.9%	17.2%	17.2%
Quilpie Shire	6,745,556	2.8%	2.8%	2.8%	2.8%	3.0%	3.0%	3.0%	3.0%	2.8%	2.8%	2.8%	2.8%
Toowoomba Regional	1,297,541	1.6%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	8.5%	8.5%	8.5%
Western Downs Regional	3,794,438	6.9%	8.1%	13.3%	15.4%	17.0%	19.8%	20.8%	20.9%	21.0%	26.3%	27.7%	27.7%

Area of LGA covered by PLs is calculated from the grants and relinquishments processed as of 30 June each year. Only Petroleum Leases with approval dates have been included. Where a PL had an approval date, but not a date at which it became non-current, it was treated as current if a renewal application had been lodged, but otherwise the expiry date was taken as the non-current date. Some LGAs have not had PLs granted within them and so do not show in the results tables.

The Maranoa and Western Downs LGAs, situated in the Surat Basin, host the majority of Queensland's CSG activities. The Barcoo, Bulloo and Quilpie LGAs host the majority of the Cooper Basin's petroleum development activities which have traditionally been focused on conventional oil and gas targets. As new and emerging areas develop further, increased activity can be expected in the Banana, Central Highlands and Isaac LGAs.

These and other emerging areas in the McKinlay and Bourke LGAs may host gas exploration activities that are associated with what is commonly referred to as 'unconventional' targets.

The terms 'conventional' and 'unconventional' refer to the techniques and technologies required to extract the gas from host rocks. Conventional resources are extracted using traditional methods, drilling wells directly into a subsurface reservoir where oil and gas is trapped in a geological structure. Unconventional resources are those that require greater than industry-standard levels of technology or investment to extract.

Find out more on the CSIRO website: [What is unconventional gas?](#)



Pipelines

For safety reasons all pipelines (large-diameter, high-pressure transmission pipelines and gathering lines that transport gas over long distances) are positioned underground. Only under certain circumstances will sections of pipeline be positioned above ground (such as for ongoing maintenance purposes).



Well pads

Well pads are typically comprised of well heads, separator, and compressors (this varies amongst resource companies). Well pads are easily visible due to their positioning on a well cleared area, typically measuring 100 m x 100 m in size¹ during drilling operations. For the purpose of this report, the well footprint refers to the area directly under a well pad.

¹ See page 61 of 'Gas Guide 2.0 – Full edition' (<https://www.gfcq.org.au/gasguide>) – Types of gas wells and well pads

Table 3. Cumulative petroleum well footprint area (ha) and percentage by LGA to 30 June 2021*

Local Government Area (LGA)	LGA area (ha)	Year	Total number of wells*	Area of well pads (ha)**	% Well footprint over LGA
Balonne Shire	3,107,494	2011	98	98	0.003
		2016	98	98	0.003
		2021	98	98	0.003
Banana Shire	2,854,864	2011	345	345	0.012
		2016	576	576	0.020
		2021	827	827	0.029
Bulloo Shire	7,323,489	2011	587	587	0.008
		2016	683	683	0.009
		2021	805	805	0.011
Central Highlands Regional	6,040,099	2011	107	107	0.002
		2016	184	184	0.003
		2021	368	368	0.006
Isaac Regional	8,260,621	2011	636	636	0.008
		2016	759	759	0.009
		2021	844	844	0.010
Maranoa Regional	5,871,000	2011	1,039	1,039	0.018
		2016	1,762	1,762	0.030
		2021	3,203	3,203	0.055
Quilpie Shire	6,745,556	2011	309	309	0.005
		2016	344	344	0.005
		2021	360	360	0.005
Toowoomba Regional	1,297,541	2011	135	135	0.010
		2016	135	135	0.010
		2021	181	181	0.014
Western Downs Regional	3,794,438	2011	1,186	1,186	0.031
		2016	4,829	4,829	0.127
		2021	6,427	6,427	0.169

Source: Department of Resources.

* The total number of wells include CSG and petroleum wells only (including exploration, appraisal and development wells), that have not been decommissioned.

** Area of well pads is typically 1 to 1.5 ha in area and provide the working area for drilling operations (GISERA, 2018), with most being closer to 1 ha.

1 ha is used here for simplicity. A well pad footprint is generally smaller once a well is constructed and in production.

Well footprint is taken to mean the area covered by well pads in Queensland and does not include any geomechanical impacts. Aggregate well footprint is estimated as the cumulative sum of the number of wells drilled each year, minus the number of wells abandoned each year, for the period July 1901 to June 2021.

Financial year totals from 2011 to 2021 are provided in separate columns. This data extract captures data submitted to the Department for the period to 30 June 2021.

Estimates of well footprint areas are approximate only. It is assumed that each well pad, on average, covers a footprint of 1 hectare (ha). It is also assumed that abandoned well sites are rehabilitated, hence plugged and abandoned wells are subtracted from the estimate. Note, however, that there was no requirement to notify the Department of abandoned wells prior to 2011.

Marked increase in trend over the last 12 years particularly Banana, Maranoa, and Western Downs LGA's has been experienced. This is due to the development of the CSG industry and subsequent incremental growth to maintain supply to the LNG trains at Gladstone. Increasing trends also seen in Bulloo, Central Highlands, Isaac Quilpie and Toowoomba.

At its highest peak (as of June 2021), CSG and petroleum well footprint covers approximately 0.17% of land surface in the Western Downs area (where there is an average of 17 wells per 10,000 ha). The density is even lower in the Maranoa LGA, where there is an average of around five wells per 10,000 ha. The density of development activities differs when comparing conventional and CSG field developments (see Figure 2).

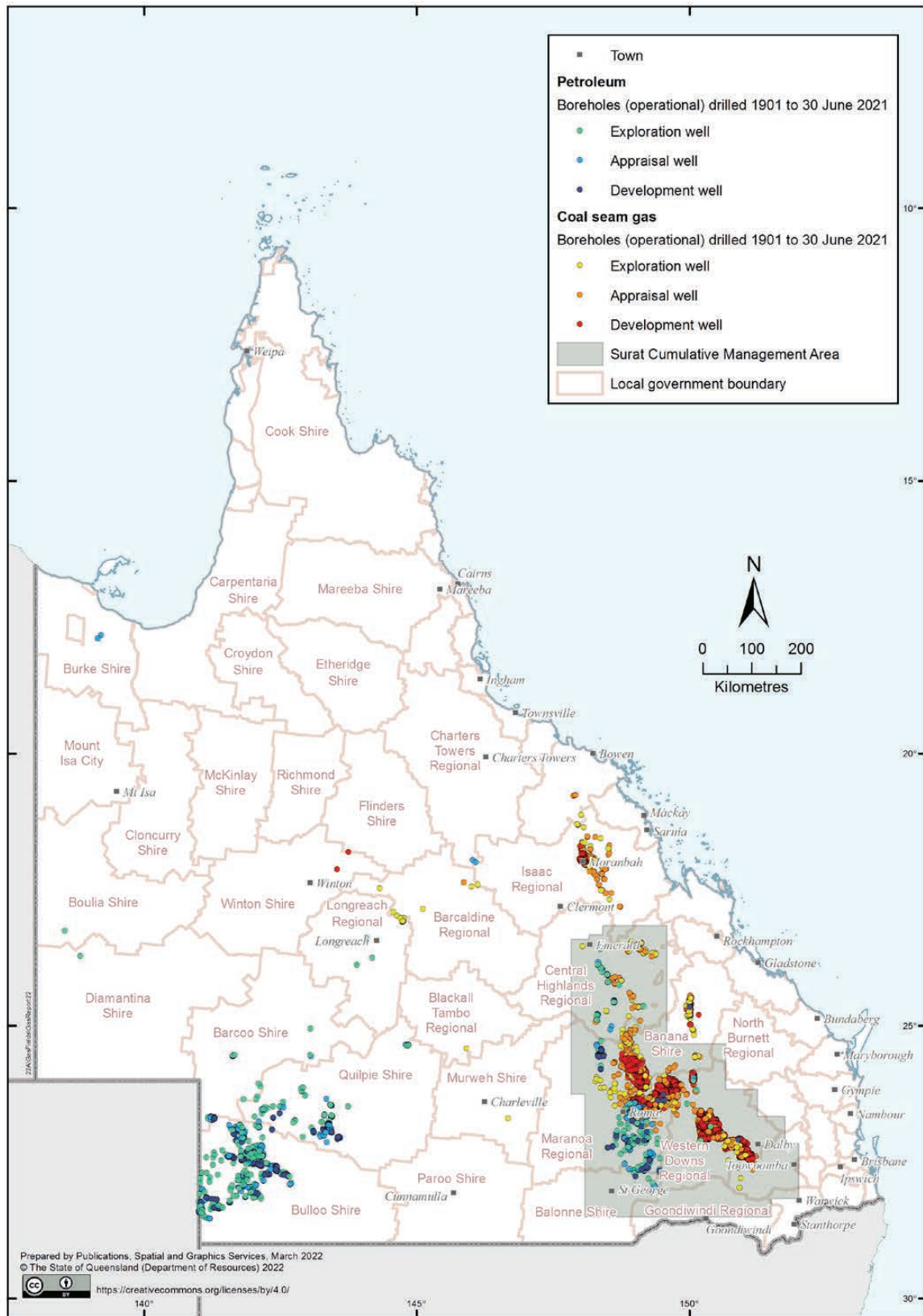
Typically, CSG production requires the depressurisation of the coal seams across a broad area to extract the gas from the reservoir. This requires wells to be drilled at an approximate spacing of 750 metres apart. As the development footprint expands, more wells need to be drilled to continue to extract the gas. Therefore, more wells are required to be drilled to extract the gas compared to the traditional conventional petroleum and gas targets.

Conversely, the techniques used to extract petroleum and gas from conventional reservoirs in Queensland requires the drilling of fewer wells.

The maturing of conventional petroleum and gas activity in the Cooper Basin means that the number of wells being drilled are declining, compared to CSG and other unconventional resources that are still developing, particularly in the Surat and Bowen Basins as seen in Figure 3.



Figure 2. The predominance of conventional activity in the west of Queensland compared to CSG activity in the east



Source: Department of Resources.

The Surat Cumulative Management Area (Surat CMA) was established by the Queensland Government in 2011 in response to coal seam gas development in the area. It covers the Surat, Southern Bowen and Western Clarence-Moreton geological basins.

Industry Production Area

Development and production areas are not static, they continuously change based on a range of factors that influence resource companies' development scenarios (e.g. reservoir dynamics, market demand, production performance, resource quality, capital investment, investment confidence). Typically, about 50 to 70%² of the total tenure area is used for production purposes with some parts of a tenure never being developed. Production areas are expressed in terms of existing areas (those areas already in production) and planned areas (those areas that are not yet in production).

Based on the 2021 Underground Water Impact Report (UWIR), the Office of Groundwater Impact Assessment (OGIA) reported the **total existing and planned production area** has increased by 8% to approximately 15,000 km² when compared to the 2018 development scenarios reported in May 2019.

The existing area of production has increased by 14% compared to 2018 which can be seen in the vicinity between Dalby and Miles, and

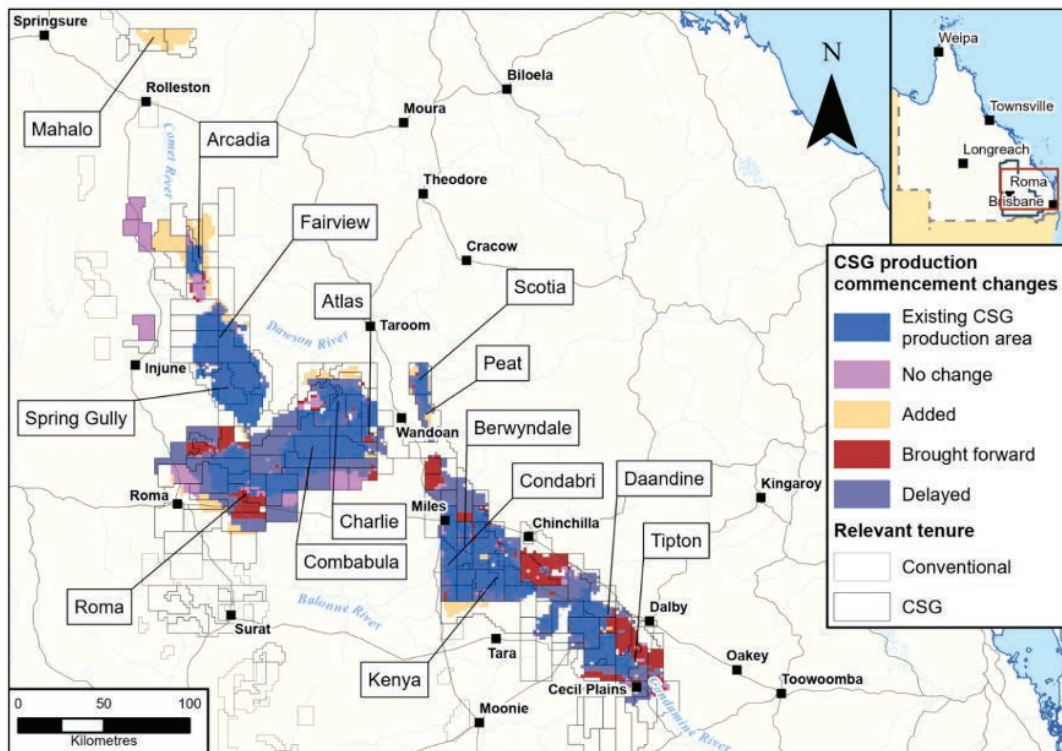
The expansion of the planned CSG production area includes the new Mahalo gas field, the re-establishment of Origin's Ironbark gas field, Santos' expansion of the Arcadia and Arcadia West gas fields, and the introduction of new area for the Arcadia field east of Rolleston.

Senex's planned production schedule has undergone major change as the Rhea, Dione, Phoebe and Pandora gas fields have all been rescheduled to commence at a later date.

Development between Dalby and Cecil Plains has generally been brought forward, as has the planned development south of Chinchilla while development area located north of Miles has generally been scheduled later, except for the northernmost part of this gas field which has been brought forward by up to 10 years.

According to the 2021 UWIR, despite an increase in the planned production areas over the longer term, there has been an overall slowing in the rate of development in the short term. The slowdown in development was likely a response to the market conditions related to the COVID-19 pandemic.

Figure 3. Development profile and planned production scenarios as of 2020



² [Underground Water Impact Report 2021 for the Surat Cumulative Management Area](#)

INSIGHTS

For the purpose of groundwater impact assessment, OGIA compiles the changes to the development profile within the Surat CMA on an annual basis and then uses this information to predict impacts and provide relevant commentary on changes.

The development profile is used by OGIA as the input scenario for the regional groundwater flow model for impact predictions, the development of various impact-management strategies and to provide relevant commentary on changes.³

The most recent statutory report from OGIA is the [Underground Water Impact Report 2021 for the Surat Cumulative Management Area](#) (UWIR 2021).

PETROLEUM AND GAS WELLS

Infrastructure associated with gas wells and well pads typically deliver the greatest surface disturbance.

As of **30 June 2021**, a total of **16,499 CSG and petroleum wells** had been drilled in Queensland (across all tenure types) since records began in 1901. Of these wells:

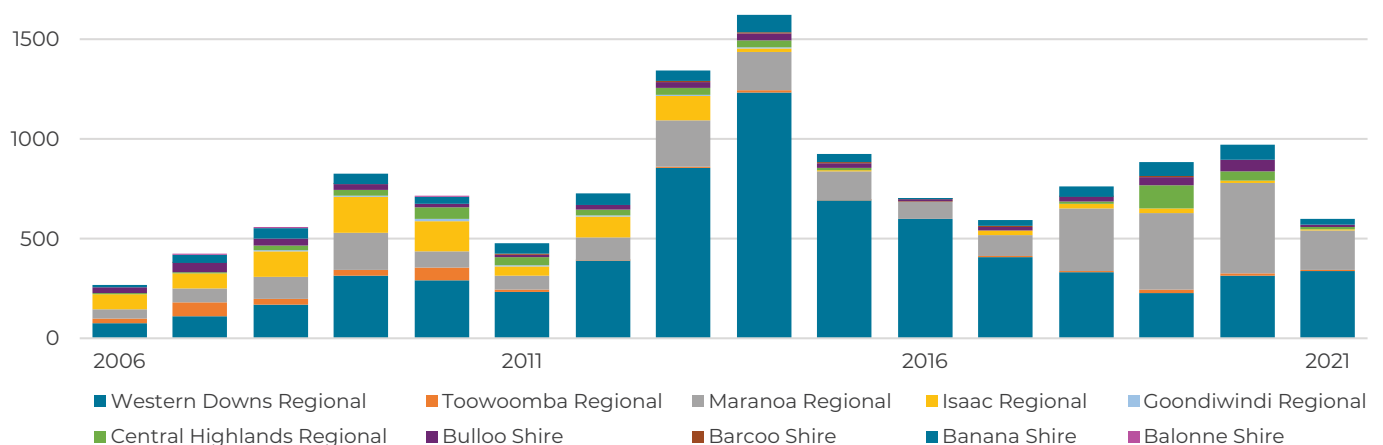
- 12,941 targeted CSG with 96% located within the Bowen and Surat basins, and the remainder (529 wells) located in other basins
- 3,558 targeted conventional and other unconventional resources (non-CSG), 48% of these are located in the Cooper-Eromanga basins; 44% in Bowen-Surat basins, and 8% located in other basins.

During FY21, a total of 585 CSG wells and 18 non-CSG wells were drilled throughout Queensland.

It is important to note that at any point in time, not all petroleum and or CSG wells that have been drilled are in production. Some wells have been decommissioned (plugged and abandoned), some have been repurposed (converted into water bores, reinjection wells, or monitoring bores) while others are capped/shut-in/suspended.⁴

Therefore, the total number of producing wells is far fewer than the total number of wells drilled.

Figure 4. Total petroleum and coal seam gas wells drilled in each local government area (LGA) for financial years 2006-2021



³ [Underground Water Impact Report 2021 for the Surat Cumulative Management Area](#)

⁴ The status 'capped/shut-in/suspended' refers to wells that are on standby to come into production. It can also refer to producing wells that have been turned off. This can happen for a number of reasons, e.g. waiting for a workover, uneconomic to produce, waiting for abandonment etc.

CSG AND PETROLEUM WELL STATUS BY LGA

The data presented below reflects the status of each well at the time it was entered into the [Geological Survey of Queensland's \(GSQ\) database](#).

A resource company can bring capped/shut-in/suspended wells back into production, or cap, shut-in or suspend producing wells at any time without notifying the Department of Resources (Resources). Therefore, the term "operational" in Table 4 encompasses those wells that are in production and those that are classified as capped/shut-in/suspended.

Table 4. Number of wells drilled and their status in FY21 as grouped by LGAs (also see Figure 8 and Figure 9)

Local Government Area (LGA)	Plugged and abandoned		Operational (producing and capped/shut-in/suspended)	
	CSG	Petroleum	CSG	Petroleum
Banana Shire	0	0	24	0
Bulloo Shire	0	1	0	12
Central Highlands Regional	0	0	12	1
Isaac Regional	0	0	3	0
Longreach	0	0	5	0
Maranoa Regional	2	0	195	3
Toowoomba Regional	0	0	4	0
Western Downs Regional	2	0	338	1
Total	4	1	581	17

Source: Department of Resources.

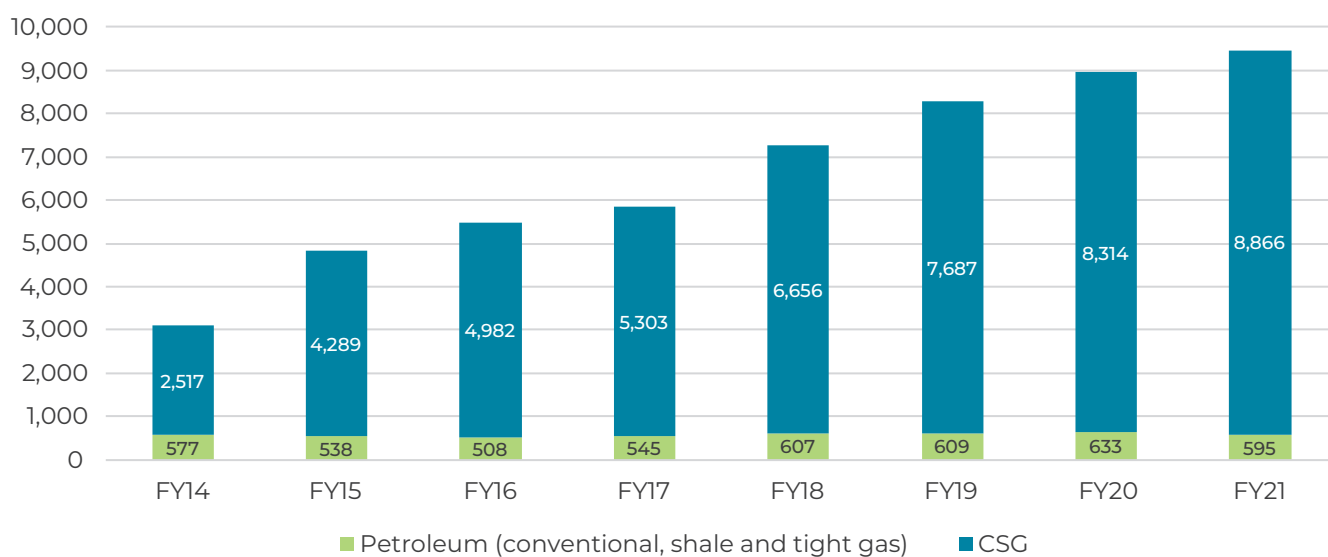
Producing Wells

As of 30 June 2021, there was a total of 9,461 producing petroleum and CSG wells in Queensland.⁵ The number of CSG wells in Queensland has grown rapidly since 2010 to support Queensland's growing LNG export industry.

The actual number of producing petroleum and gas wells is obtained from Resources Safety & Health Queensland (RSHQ), who collect and maintain a register of producing wells based on the safety and health fee paid by resource companies.

⁵ This is the number of petroleum and gas wells within petroleum leases that have produced petroleum and/or gas in each financial year and for which a safety and health fee was paid.

Figure 5. The growth in the number of producing CSG wells since FY14



Source: Resources Safety & Health Queensland.

INSIGHTS

As technology has improved over the years, many changes have occurred, particularly in the time it takes to drill wells⁶ and with resource companies adapting and introducing new practices to minimise the impacts and surface disturbance for landholders.⁷ These include the use of multi-well pads that allow multiple wells to be drilled on a pad,⁸ colocation and grouping of infrastructure, negotiating with landholders to locate infrastructure in areas that will least affect their existing farming practices, and increasing use of constraints mapping.



⁶ Page 63 of 'Gas Guide 2.0' (<https://www.gfcq.org.au/resource-hub/the-gas-guide/>) – Days development drilling

⁷ Page 65 of 'Gas Guide 2.0' (<https://www.gfcq.org.au/resource-hub/the-gas-guide/>) – Noise, light & dust

⁸ Page 61 of 'Gas Guide 2.0' (<https://www.gfcq.org.au/resource-hub/the-gas-guide/>) – Types of gas wells and well pads

FUTURE WELL PROJECTIONS WITHIN THE SURAT CMA

By the end of 2021, approximately 8,900 CSG wells were already drilled within the Surat CMA, 84% of which are located in the Surat Basin, with the remainder found in the southern Bowen Basin. Approximately 500 wells (used for exploration or testing purposes) are located outside CSG production areas.⁹

With the increase in the net production area footprint in the Surat CMA, the total number of projected wells has also increased slightly, from approximately 21,000 wells reported in May 2019, to approximately 22,000 wells by 2050 (Figure 6). Since 2012, when the gas fields increased production to supply the LNG facilities at Curtis Island, between 1,000 to 1,500 wells have been drilled and completed annually. This trend is forecast to continue until approximately 2023.

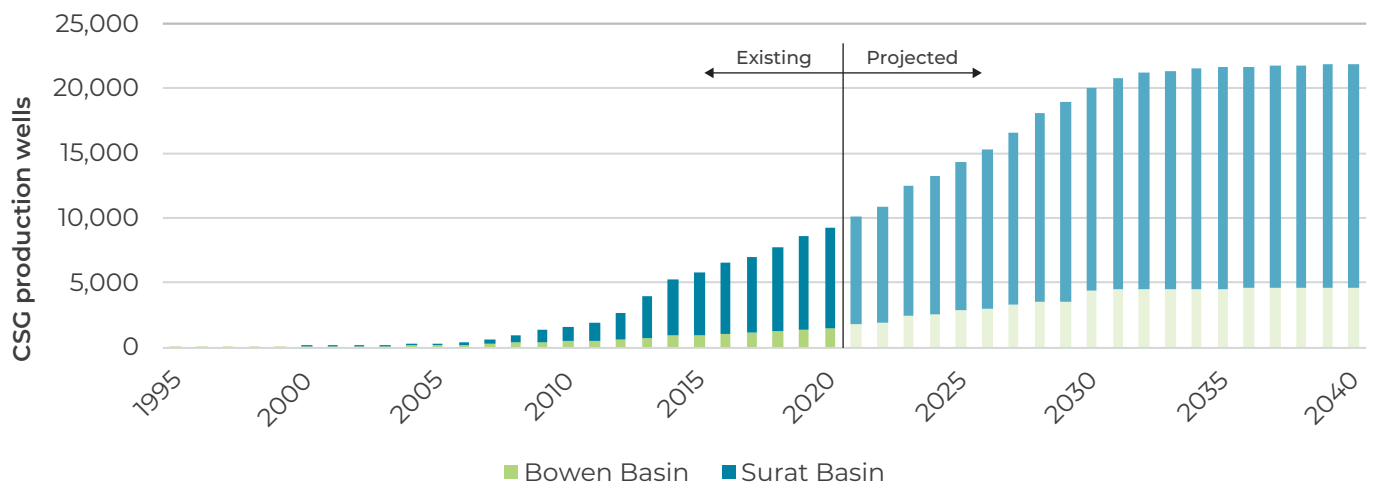
With technological advances, industry has deployed alternative drilling techniques to access petroleum and gas resources, including the use of directional and horizontal drilling.

There are approximately 730 directional or horizontal wells in 352 clusters, 314 in the Bowen Basin and 38 in the Surat Basin. Directional wells involve drilling a well at non-vertical and non-horizontal angles. Directional drilling allows a resource company to intersect target formations where vertical wells are not possible or practical. Directional wells are also used where multiple wells are drilled from the same well pad location, referred to as a multi-well pad.

Multi-well pads allow multiple wells to be drilled on a single pad. The benefits include a smaller over-all footprint per well, fewer well pads on a property, a greater distance between pads (up to 2.4km), less gathering pipelines and access required by the resource company, and the ability to locate pads in paddock corners/less productive areas for a better fit with existing farming practices.

Horizontal wells can be drilled along a target formation. This type of well typically involves drilling a vertical well to the desired depth and then steering the drill bit to travel horizontally along a target formation. The benefit of horizontal wells is that intersection with target formations is maximised, which reduces the overall number of wells required to be drilled.

Figure 6. Existing and projected CSG wells to 2050



Source: Office of Groundwater Impact Assessment

The number of petroleum and gas wells recorded in the GSQ Open Data Portal may be significantly higher than reported above because the portal includes non-operational, converted, and abandoned wells. OGIA infers the type of wells and their status based on contextual information such as their location, depth, tenure types and reported water production.

⁹ Underground Water Impact Report 2021 for the Surat Cumulative Management Area

HYDRAULIC FRACTURING

The process of hydraulic fracturing¹⁰ ('fracking' or 'fracing') is used to stimulate gas production from geological formations with a low permeability.

About hydraulic fracturing

Hydraulic fracturing is a post-drilling stimulation technique used in the oil and gas sector to enhance permeability (connected pore spaces) of an oil or gas reservoir (sandstone, shale or coal).

Permeability of petroleum reservoirs is the key parameter that determines the flow rate and recoverable volume of petroleum (oil or gas) that can be produced economically from a well.

In areas of low permeability, it is possible to artificially increase oil and gas flow rates by the hydraulic fracturing process, which involves pumping water under high-pressure to fracture a limited zone around the injection point in the reservoir.

Hydraulic fracturing is a high-cost activity and only undertaken when economic factors (i.e., improved gas/oil flow rate and volume) warrant its use.

In Australian CSG fields, a key determinant of permeability will be depth of the reservoir. In general terms, the deeper the target coal (or sandstone or shale in the case of petroleum) the lower the permeability.

As a consequence of the depth-to-permeability relationship, wells requiring hydraulic fracturing will be located in deeper parts of petroleum basins, which is generally towards the centre. The Bandanna Formation in the Northern Bowen Basin is an example of a region where hydraulic fracturing is used for these reasons. Conversely, for tenures near the margins of a basin where coals are shallower (such as the Walloon Coal Measures of the Surat Basin), stimulation is both unlikely to be required, and is technically and commercially unviable.

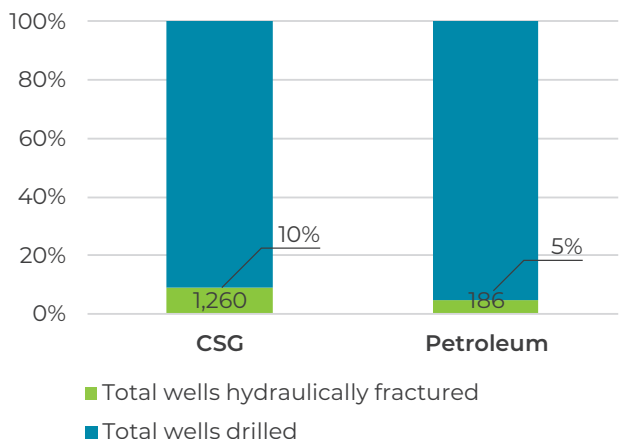
Hydraulic fracturing is a regulated activity in Queensland and before the practice can be deployed, a petroleum and gas company is required to obtain the appropriate approvals. Currently, only a small fraction of wells drilled in Queensland are hydraulically fractured, as this process adds significant expense to the cost of gas production.

As the gas exploration and production activity expands into geological plays that are technologically more difficult to extract, it could be expected that hydraulic fracturing of wells will become more prevalent especially in the emerging areas across Queensland where tight gas and shale gas are being targeted.



¹⁰ See FAQ 'What is hydraulic fracturing ('fracing'/'fracking'), what chemicals are used and how are they regulated?' via: <https://www.gfcq.org.au/resource-hub/faqs/>

Figure 7. Total CSG and Petroleum Wells drilled and % hydraulically fractured



Overall, as of 30 June 2021, 10% of CSG wells drilled in Queensland were hydraulically fractured, while 5% of petroleum wells drilled were hydraulically fractured.*

*Data presented in this section begins in FY2011

This data is based on PGGD-04 forms (Notice of completion of hydraulic fracturing activities), which were introduced in 2010; therefore, the data presented here begins in FY11. Some LGAs do not have hydraulically fractured wells within them, so may not be shown in these data tables. This data extract captures data submitted to Resources for the period to 30 June 2021 (as of 9 September 2021). The figure of number of wells hydraulically fractured represents the first instance a well was hydraulically fractured in its lifetime. A well can be hydraulically fractured a number of times at any point during its lifetime thereafter.

As of 30 June 2021, the following number of CSG and petroleum wells were hydraulically fractured compared to those that were not. This graph only includes LGAs where wells were hydraulically fractured.

Figure 8. CSG Wells

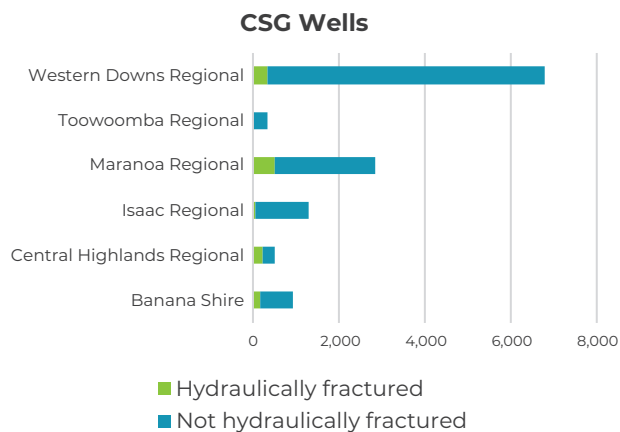


Figure 9. Petroleum Wells

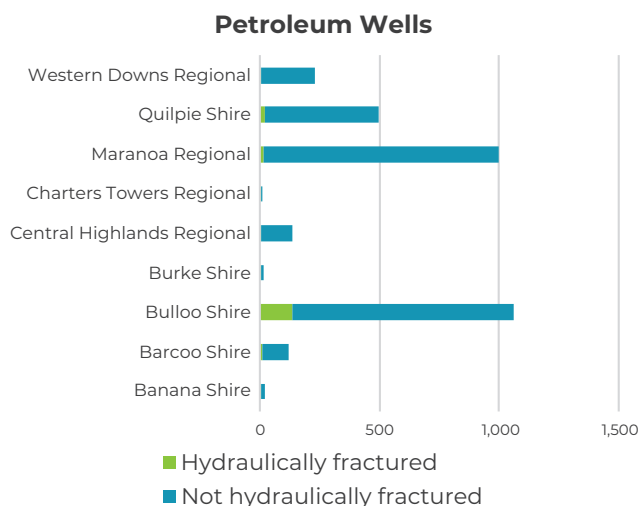


Figure 10. Percentage of CSG wells drilled in FY21 that were hydraulically fractured

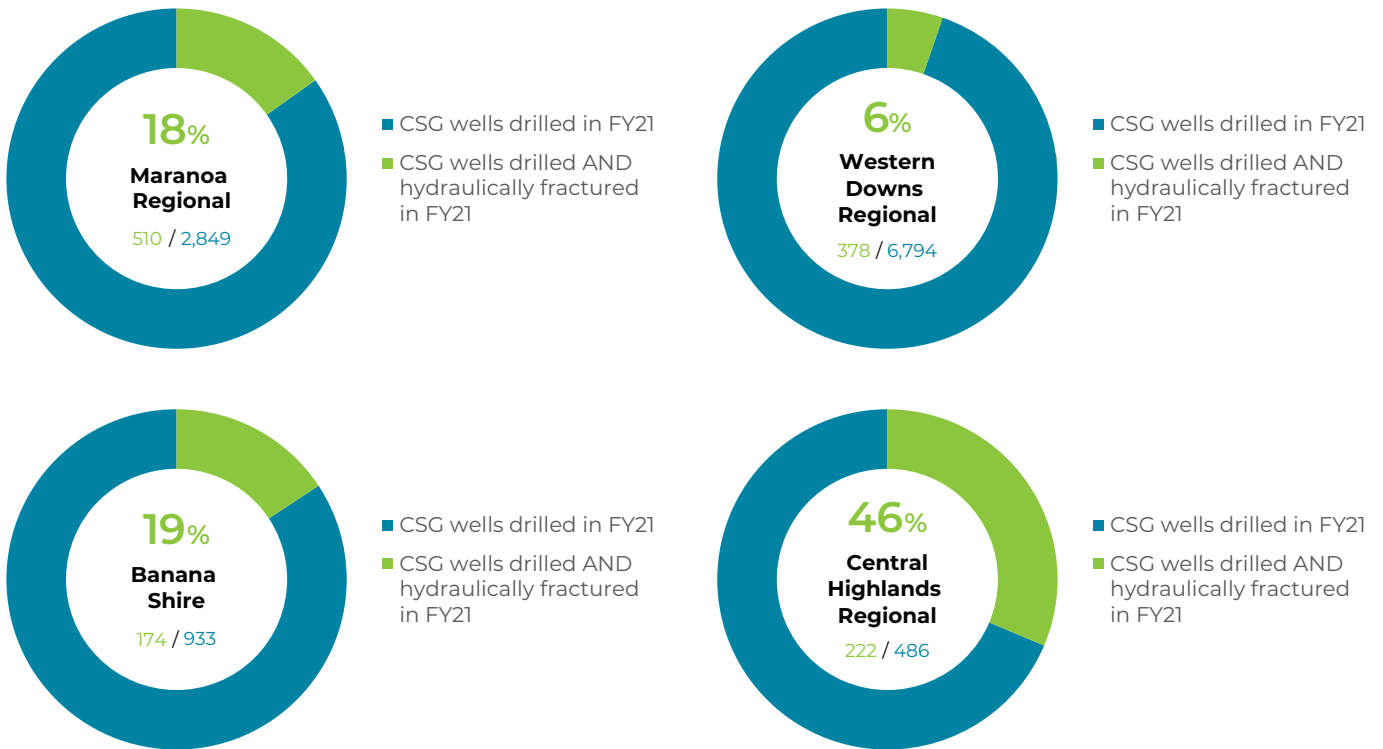
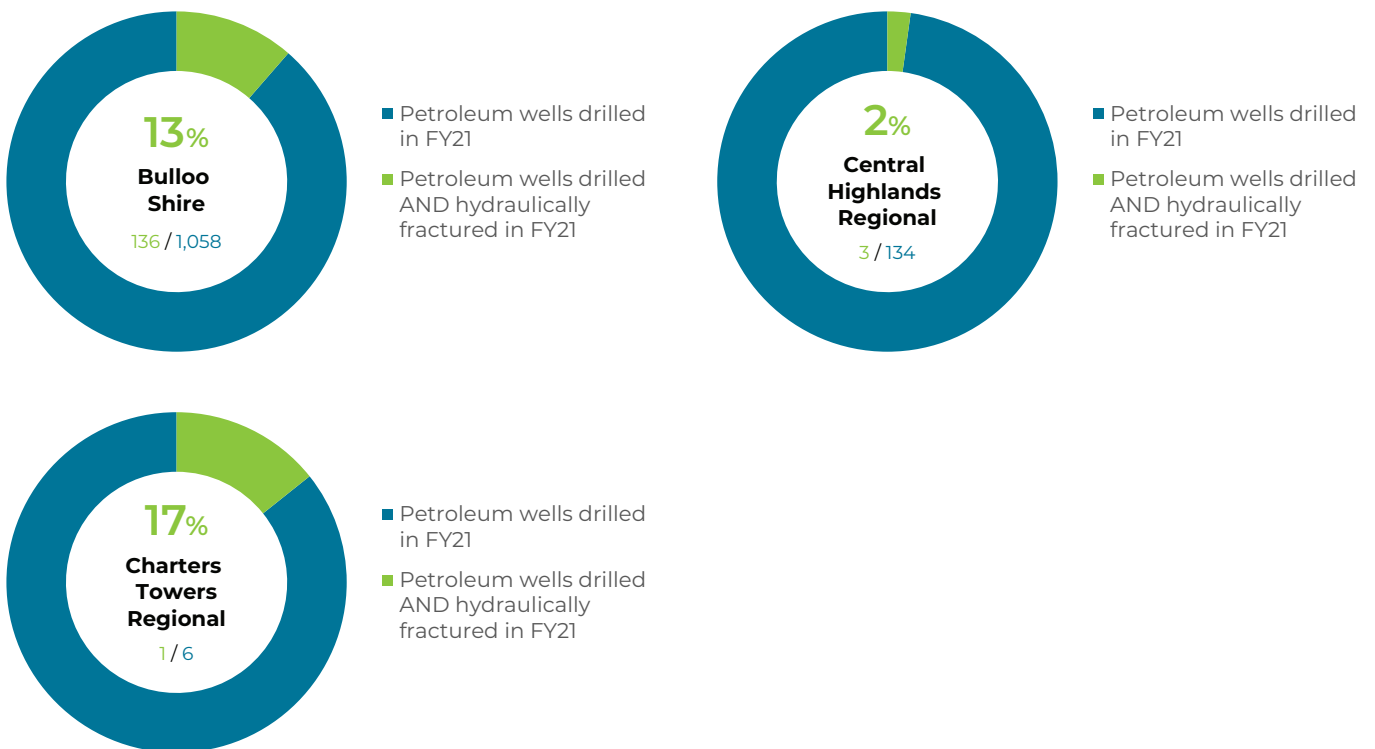


Figure 11. Percentage of petroleum wells drilled in FY21 that were hydraulically fractured



It is important to note that a well can be hydraulically fractured several times during its lifetime; however, for the purpose of this report, it is only counted once. The numbers represented here are the total number of wells that have been hydraulically fractured (at least once), not the number of times each well have been hydraulically fractured.

Hydraulic fracturing may have occurred at some point during the life of the well, and may or may not be in the year it was drilled.

AGRICULTURE AND INDUSTRY OVERLAP – LAND USE

Queensland has the largest area of agricultural land (83%) of any Australian state or territory and the highest proportion of land area in Australia dedicated to agriculture.¹¹ As the majority of land in Queensland is used for agricultural purposes, it can be expected that resource tenure overlaps with land used for agricultural purposes. While landholders have ownership rights to the surface of the land, the resources that lay in the subsurface are owned by the State on behalf of the entire community.

Petroleum and gas resources in Queensland are owned by the State and managed by the Queensland Government on behalf of the people of Queensland. The Queensland Government grants tenures that gives resource companies the right to explore for, produce and transport petroleum and gas.

Petroleum tenures are often on properties not owned by the tenure holder, and agricultural businesses are typically either leasehold or freehold property. As such, petroleum and gas tenures often overlap with other land uses. Before a resource company can access freehold or leasehold land, it must obtain the necessary approvals from government and comply with land access requirements.

Concerns about overlapping land uses are best resolved through land use government policies or civil means rather than applying bans or objections to resources activity on agricultural land. Leading-practice policies seek to balance the trade-offs between resources development and other land uses to maximise economic benefits for the community.

Table 5 shows the primary land use coverage by petroleum production tenures (granted and under application) for each land use category listed. The land use categories contain relevant sub-categories which were summed and merged to produce the Primary Land Use areas.



¹¹ [Queensland AgTrends 2019–2020](#)

Table 5. Primary land use coverage by petroleum production tenures as of 30 June 2021

Primary land use	Examples of related land use	Queensland land use areas (% of Queensland area)*	% of primary land use area overlapped by PL (granted and under application)**
Intensive uses	Residential and industrial areas, as well as intensive agricultural production such as feedlots and greenhouses. These also include manufacturing and industrial, residential and farm infrastructure, services, utilities, transport and communication, mining, waste treatment and disposal	1,200,000 ha (0.7%)	49,200 ha (4.1%)
Production from dryland agriculture and plantations	Cropping, non-irrigated pastures and plantation forests	3,500,000 ha (2.0%)	329,000 ha (9.4%)
Production from irrigated agriculture and plantations	Irrigated cropping, irrigated fruits and vegetables, including irrigated plantation forests	1,100,000 ha (0.6%)	86,900 ha (7.9%)
Production from relatively natural environments	Grazing native vegetation (e.g. in a state forest and on State owned land) including production from native forests	140,800,000 ha (81.4%)	3,660,800 ha (2.6%)
Water	Lakes/dams, rivers, estuaries and wetlands	7,200,000 ha (4.2%)	172,800 ha (2.4%)
Conservation and natural environments	National parks, stock routes and natural areas of defence land	19,200,000 ha (11.1%)	172,800 ha (0.9%)
Total		173,000,000 ha (100.0%)	4,471,500 ha (2.6%)

*Qld land use areas in ha are rounded.

**PL Granted and under application. This doesn't reflect the actual surface footprint of petroleum and gas infrastructure over these land use types (refer to Industry Footprint section).

Source: Department of Resources (2021) Areas of Regional Interest

Areas of Regional Interest

[Areas of regional interest](#) are identified under the Regional Planning Interests Act 2014. Each area of regional interest is identified based on its contribution, or likely contribution, to Queensland's economic, social and environmental prosperity. For the purposes of resources activities, areas of regional interest are considered to be 'constrained land'.

There are four categories of areas of regional interest:

- Priority Agricultural Area (PAA)
- Priority Living Area (PLA)
- Strategic Cropping Land (SCL)
- Strategic Environmental Area (SEA)

Before a resource activity can occur in areas of regional interest, a resource company must apply for and be granted a Regional Interest Development Approval (RIDA) as described under the *Regional Planning Interest Act 2014*. Alternatively, the resource company must demonstrate that it is exempt from the requirement to obtain a RIDA.

Table 6. Constrained land use under petroleum tenure as of 30 June 2021

LGA	Constrained Land type	Amount of LGA that is constrained land		Amount of constrained land covered by petroleum lease		Number of operational P&G wells within the constrained land
		Area (ha)	Percentage of LGA	Area (ha)	Percentage of constrained land type	
Balonne Shire	PAA	439,608	14.1%	0	0.0	0
	PLA	8,411	0.3%	0	0.0%	0
	SCL	693,171	22.3%	10,877	1.6%	11
Banana Shire	PAA	165,702	5.8%	21,529	13.0%	66
	PLA	19,586	0.7%	3,273	16.7%	7
	SCL	908,833	31.8%	76,781	8.4%	215
Barcoo Shire	SEA	1,463,309	23.5%	15,934	1.1%	2
Bulloo Shire	SEA	964,152	13.2%	162,013	16.8%	202
Central Highlands Regional	PAA	886,387	14.8%	83,064	9.4%	48
	PLA	27,871	0.5%	0	0.0%	0
	SCL	1,326,011	22.2%	111,024	8.4%	212
Goondiwindi	PAA	254,382	13.2%	0	0.0%	0
	PLA	13,055	0.7%	0	0.0%	0
	SCL	1,160,100	60.2%	710	0.1%	0
Isaac	PAA	14	0.0%	0	0.0%	0
	SCL	484,900	5.9%	611	0.1%	1
Maranoa	PLA	19,469	0.3%	11,689	60.0%	0
	SCL	990,483	16.9%	373,908	37.8%	1310
Quilpie	SEA	433,234	6.4%	27,680	6.4%	9
Toowoomba	PAA	1,025,514	79.0%	109,933	10.7%	173
	PLA	101,159	7.8%	2,361	2.3%	1
	SCL	639,090	49.3%	76,148	11.9%	21
Western Downs	PAA	743,571	19.6%	250,793	33.7%	1289
	PLA	33,944	0.9%	8,993	26.5%	33
	SCL	1,933,711	51%	467,257	24.2%	2458

Where a constrained land type is not present in an LGA, that row has been removed.

Areas with different constraints can not be summed. They are not additive because multiple constrained land types can overlap the same area.

The land use data was processed in ArcGIS to produce areas and calculate the number of wells within each LGA for each constrained land category. Processing involved spatial clipping, polygon intersections and reprojection to enable area calculations. This spatial manipulation and inherent polygon overlap errors may have introduced minor inaccuracies in area calculations. Only the final results are provided here.

Maranoa and Western Downs have the highest number of operation P&G wells within constrained land.

LAND ACCESS AND COMPENSATION

Under Queensland’s land access laws, resource companies have the right to access and undertake petroleum and gas activities on a landholder’s property provided that all legal requirements under the land access laws are complied with. The legal requirements depend on the type of activities that are to be carried out on the landholder’s property.

As of June 2021, there were 5,036 Conduct and Compensation Agreements (CCAs) recorded on Queensland land titles. The majority of these are associated with production lease and pipeline licence activities.

Preliminary activities such as walking the area, taking soil samples or survey pegging (minimal impact on landholders)	Advanced activities such as infrastructure construction (longer term and/or extensive impacts on landholders)	Decommissioning activities such as rehabilitation for wells or pipelines
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A Conduct and Compensation Agreement (CCA) is required for any advanced activities. This is a legally binding document that specifies the company’s activities and behaviours, respective obligations and protections. A CCA also ensures the landholder is compensated for the effects and impacts of the advanced activities.

All CCAs are registered on the property’s land title. If a property is sold, any registered CCAs are transferred with it.



Figure 12. Total CCAs registered by FY

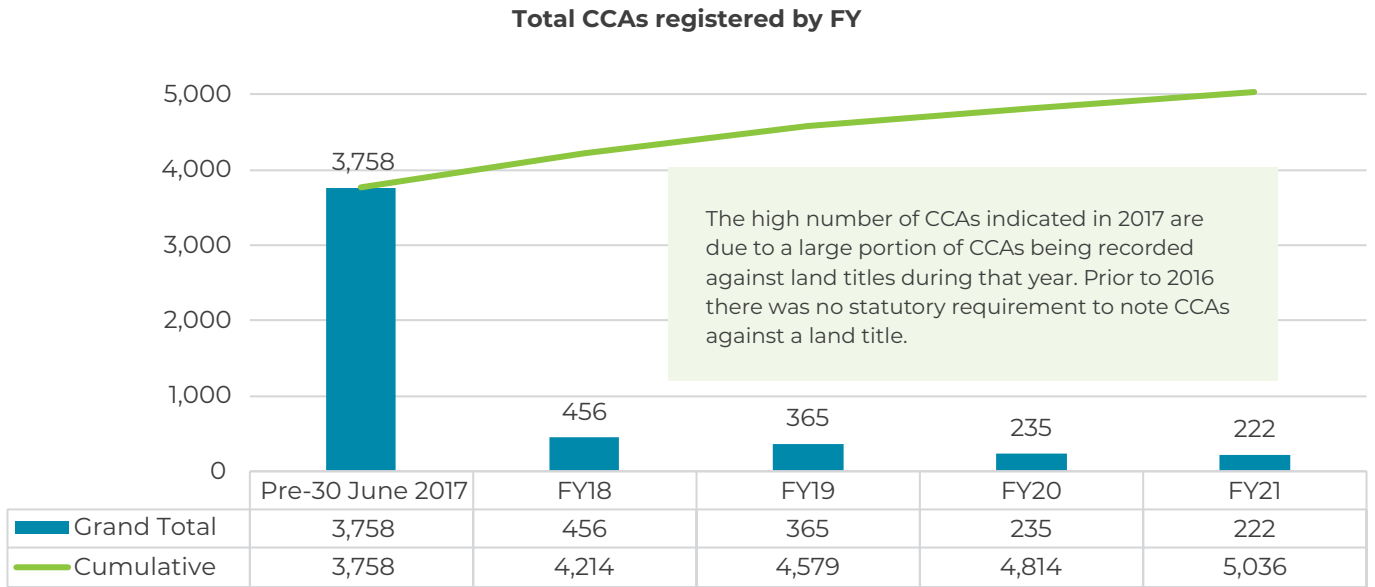


Figure 13. Total CCAs registered by LGA

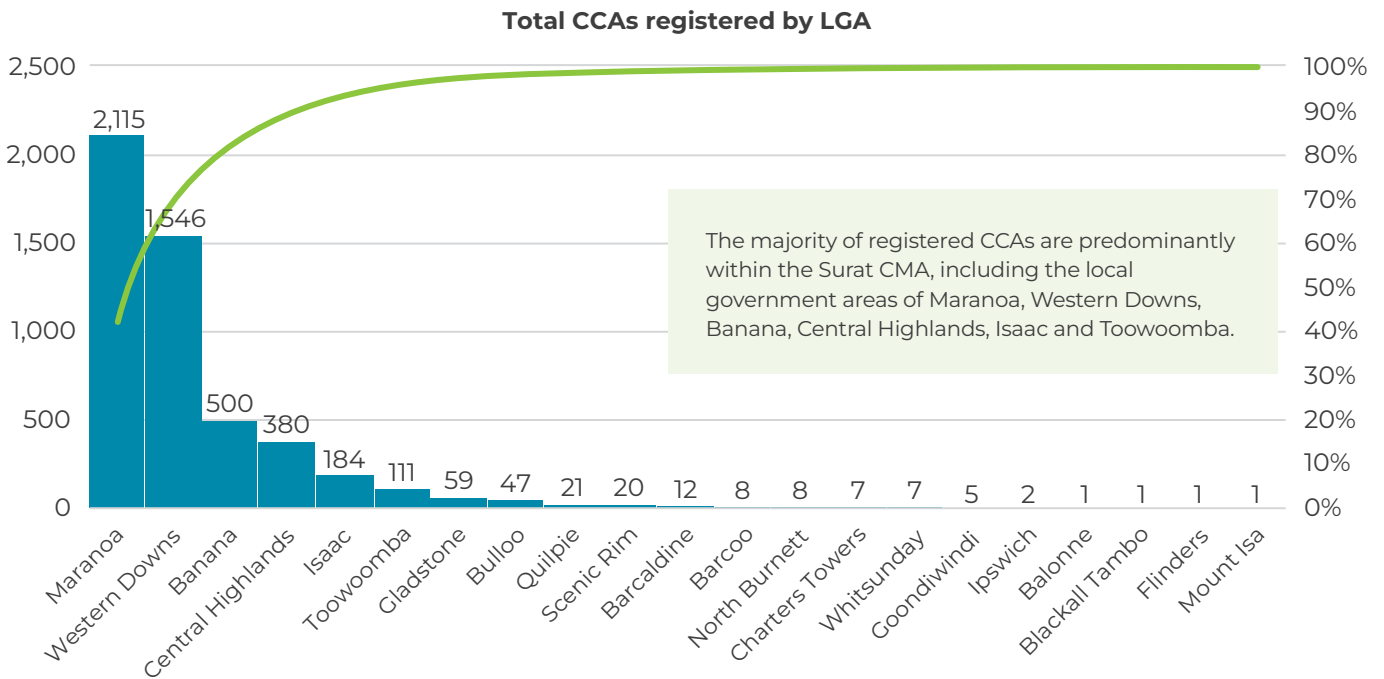
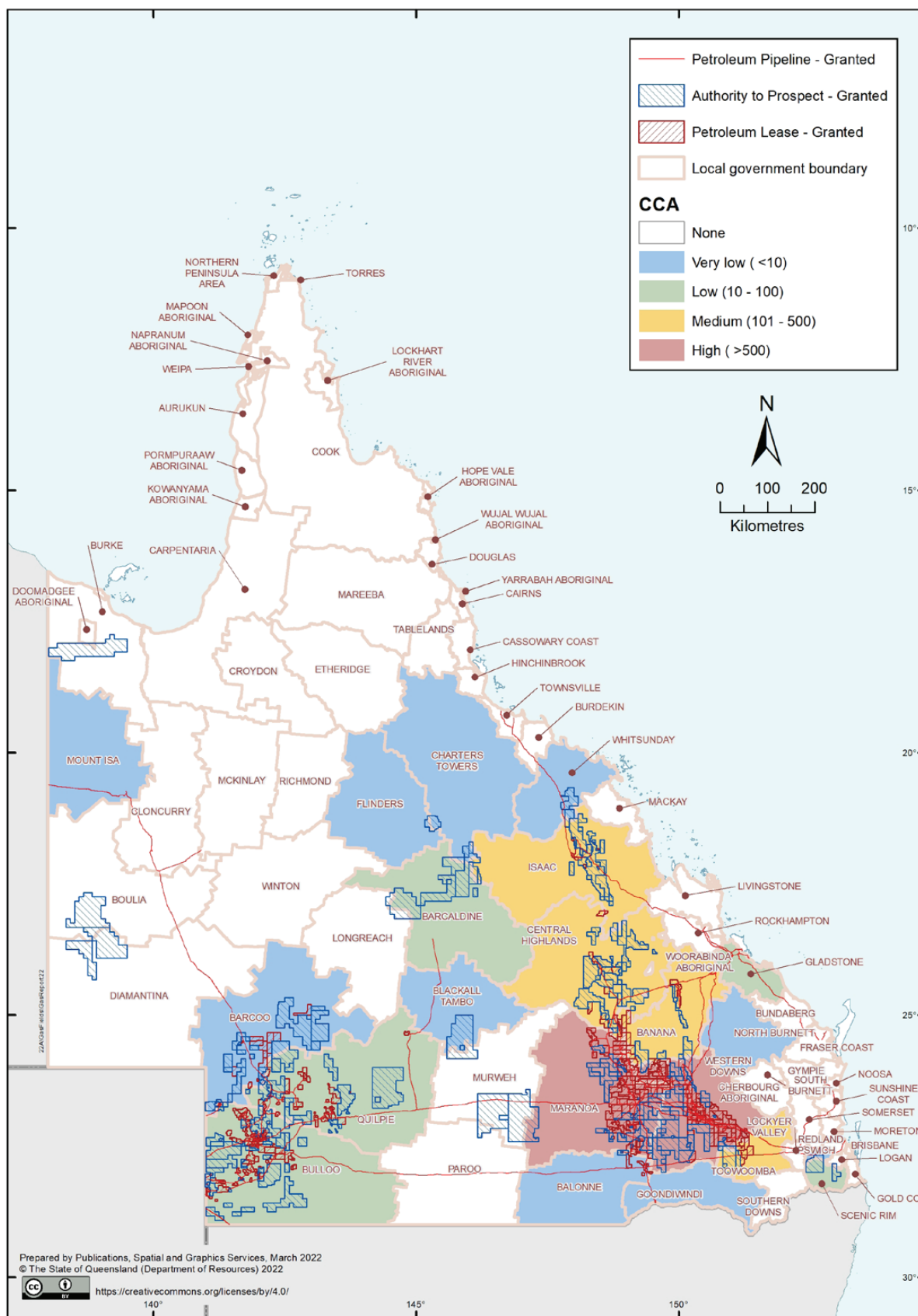


Figure 14. Landholders living in the Maranoa and Western Downs LGAs accounted for 72% of all CCAs



Based on the Commission’s research, the 5,036 CCAs recorded on title are registered across 2,491 different lot on plans. This indicates that some landholders hold more than one CCA.

INSIGHTS

A CCA that is registered on title is also referred to as a “dealing”. A lot on plan may have more than one dealing (CCA) and a dealing may have more than one owner registered on title. The registered owners (or landholders) on title are not limited to individuals, but may include other entities such as corporations, gas companies, regional councils, and the State of Queensland.

Because of this situation, it can be difficult to determine/calculate the number of unique landholders that have signed CCAs with the gas industry.

For example, when there are four people named on title for one lot on plan, there will be four owners party to the same CCA. Therefore, the title records will only register the one CCA, however, there will be four landholders who have a CCA with the resource company.

As a result, the Commission has determined that it will report on the total number of CCAs and the number of individual lot and plans only.

Table 7. Number of lot on plans with the corresponding number of registered CCAs

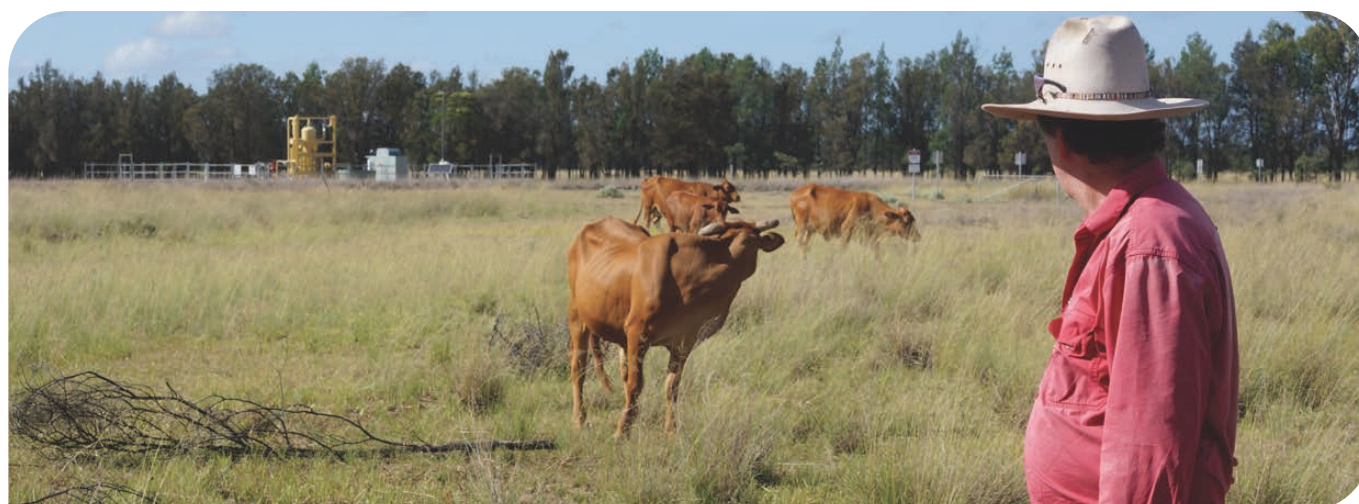
Number of CCAs registered against a lot on plan	Number of lot on plans with CCAs	Description
>10	48	48 lot on plans have more than 10 CCAs registered against it
4-10	198	198 lot on plans have between 4 and 10 CCAs registered against it
3	181	181 lot on plans have 3 CCAs registered against it
2	488	488 lot on plans have 2 CCAs registered against it
1	1,576	1576 lot on plans have 1 CCAs registered against it
Total	2,491	



Table 8. Number of CCAs on freehold and leasehold properties per LGA

90% percent of the CCAs are associated with freehold land.

Count of Dealing No	FREEHOLD	LEASEHOLD	Grand Total
Balonne	1		1
Banana	373	127	500
Barcaldine	4	8	12
Barcoo		8	8
Blackall Tambo	1		1
Bulloo		47	47
Central Highlands	344	36	380
Charters Towers		7	7
Flinders	1		1
Gladstone	58	1	59
Goondiwindi	3	2	5
Ipswich	2		2
Isaac	149	35	184
Maranoa	1,986	129	2,115
Mount Isa	1		1
North Burnett	6	2	8
Quilpie	1	20	21
Scenic Rim	20		20
Toowoomba	108	3	111
Western Downs	1,470	76	1,546
Whitsunday	2	5	7
Grand Total	4,530	506	5,036

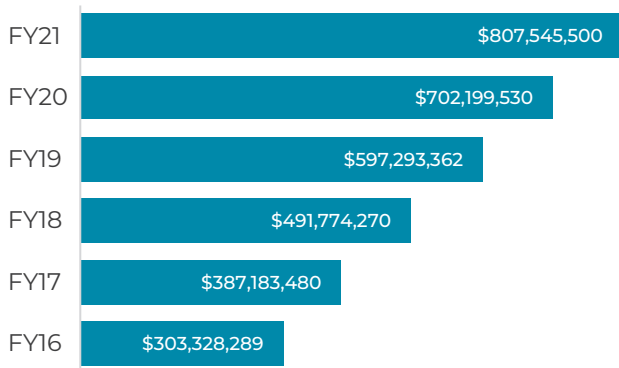


COMPENSATION PAID

In FY21, \$105 million in compensation was paid to landholders for the impacts resulting from petroleum and gas development activities on their properties.

The figure below shows the cumulative compensation that has been paid to date is more than \$807 million.

Figure 15. Cumulative compensation paid to landholders



Important considerations:

It is not possible to calculate an individual CCA value as each CCA is uniquely negotiated based on factors such as:

- every property, land value, business operation and profitability is different;
- the type and extent of company activity on each property and impact to a landholder’s operations is different.

Other considerations include:

- the total number of CCAs include agreements that are signed before the commencement of company activities, and payments are not yet due; and
- apportionment of payments vary significantly between agreements, from a large proportion of total compensation paid up front to annual compensation payments over the life of the agreement.

Other Notes

- There are agreements in place within and between resource companies. These agreements are regarded in the same ways as if they were another landholder. CCAs are required from a joint venture perspective to recover costs as part of the commercial arrangement.
- There will be a number of agreements for Queensland State Forests and other State Government owned land.
- There are also some CCAs in place with local government where infrastructure is placed on road easements or on land owned by the council – although in this case they are the public authority for the land under the legislation and do not require a CCA. Historically it has been done this way by some companies and the local government haven’t brought themselves up to speed with the process for accessing their land.
- There are other instances where the lessees and/or occupants of the land owned by and a separate CCA for the owner of the land (the State or Local Authority).

GROUNDWATER TAKE AND IMPACT MANAGEMENT

Queensland Groundwater take

The estimated total groundwater take from all aquifers across the petroleum and gas producing areas of Queensland for all purposes is approximately 390,000 ML/year.

Most of this is used for agricultural (includes stock intensive and irrigation use) and stock and domestic purposes.

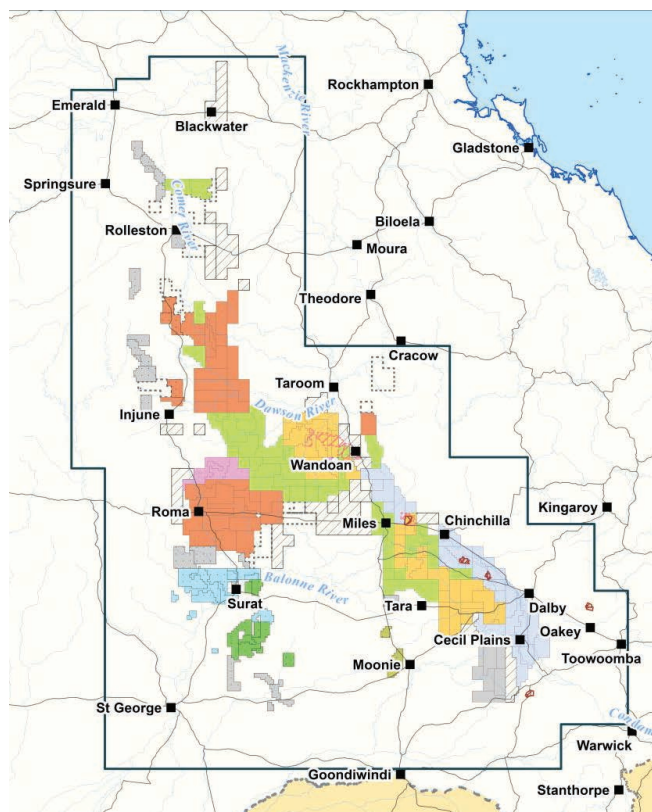
Of the total water take, approximately 134,000 ML/year (34%) is drawn from the upper alluvial and volcanic aquifers that overlie the Bowen and Surat basins for non-petroleum and gas activities.

Approximately 66,000 ML/year or 17% of the total water take is for petroleum and gas purposes.

Extracted groundwater is generally known by several different names, including 'CSG produced water', 'co-produced water', 'associated water' and 'CSG water'.

Associated water can be treated and re-used for a variety of applications including farm irrigation, town water supply, reinjection into aquifers and various industrial applications. Associated water extraction from CSG depressurisation and conventional oil and gas production is metered.

Figure 16. Surat Cumulative Management Area



Source: Office of Groundwater Impact Assessment – A summary of Underground Water Impact Report 2021 for the Surat Cumulative Management Area

Under Queensland's current regulatory framework, resource companies have the right to extract groundwater as part of the process of extracting petroleum and gas (underground water right).

The underground water right is provided to enable safe operating conditions in mines and to achieve the production of petroleum and gas. The right does not apply to other extraction of groundwater by resource tenure holders specifically for purposes such as camp water supply or road construction. Groundwater extracted for such purposes is referred to as non-associated water, the taking of which requires a water licence or water entitlement under Chapter 2 of the *Water Act 2000* (Water Act). Extracted associated water, however, can be used for other purposes, in accordance with the Queensland Government's CSG Water Management Policy which encourages the beneficial use of associated water.¹²

INSIGHTS

Resource companies operating outside the Surat CMA are required to submit a UWIR every three years, which includes an assessment of the water level decline in aquifers and any impacts to springs in both the long and short term. Within the Surat CMA, this responsibility rests with OGIA.¹³ The UWIR does not detail the bores that have been impacted, but rather identifies bores accessing water from an aquifer that is predicted to experience an impact or drawdown of more than the trigger threshold.¹⁴

¹² Underground Water Impact Report 2021 for the Surat Cumulative Management Area

¹³ Guideline - *Water Act 2000* - Underground water impact reports and final reports

¹⁴ GasFields Commission Queensland – Gas Guide 2.0

GROUNDWATER TAKE FOR PETROLEUM AND GAS ACTIVITIES

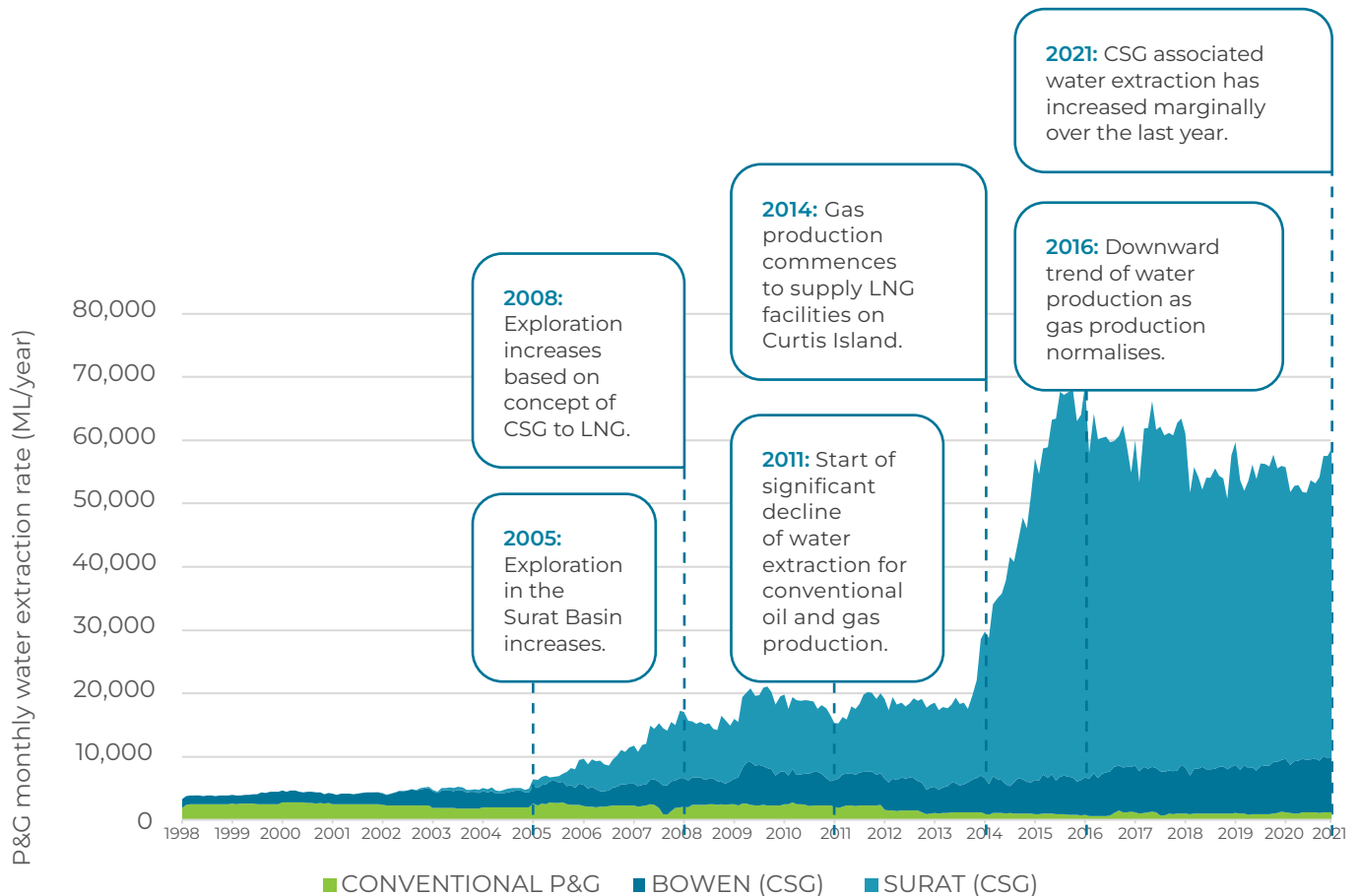
The recent UWIR reported that average predicted CSG associated water extraction has increased marginally to 54,000 ML/year due to changes in the development profile since the UWIR 2019. The total existing and planned production footprint has also increased by about 8% compared to the previous UWIR, but remains within the previously approved (2019) development footprint.

Conventional oil and gas production in the Surat CMA is in a mature phase. Water extraction has declined significantly since 2011 to the current level of around 1,000 ML/year, corresponding with declining oil production.

There has been a significant increase in associated water extraction since 2014 coinciding with the commencement of gas production to supply LNG facilities on Curtis Island peaking at 67,000 ML/year in 2015.

Overall, since 2016, the extraction rate has been progressively declining from a peak of around 67,000 ML/year – partially due to reduction in extracted water over time from existing wells and infilling of new wells in areas where partial depressurisation has already occurred.

Figure 17. Historical associated water extraction by the P&G tenure holders in the Surat CMA



About 95% of conventional associated water extraction is from the Precipice Sandstone and Evergreen Formation in the Moonie oil field. There is also some minor extraction from the Clematis Sandstone.

Summary of Surat CMA Groundwater Take for P&G purposes

The majority (45,000 ML/year) of extracted water is in the Surat Basin.

CSG water extraction in the Surat CMA has remained relatively stable in recent years, at around 9,000 ML/year (largest associated water extraction occurs from the Fairview, Talinga, Daandine, Kenya and Berwyndale gas fields).

Conventional oil and gas production in the Surat CMA is in a mature phase, with water extraction declining significantly since 2011 to the current level of around 1,000 ML/year, corresponding with declining oil production.

About 95% of conventional associated water extraction is from the Precipice Sandstone and Evergreen Formation in the Moonie oil field. There is also some minor extraction from the Clematis Sandstone

GROUNDWATER IMPACT

Under the regulatory framework, resource companies are required to manage the impacts of groundwater removal resulting from the gas extraction process. For example, resource companies are required to take a number of steps to ensure that water bore owners are not disadvantaged by their operations. This includes monitoring and identifying any potential impacts on water bores, to then negotiate the appropriate make good measure in a Make Good Agreement¹⁵ (MGA) for the affected water bore.

Predicted impacts account for all existing and proposed development over the life of the industry.

As a result of the associated groundwater take within the Surat CMA:

- **702 water bores** are predicted to be impaired over the life of the CSG industry of which 516 physically exist and are usable water bores, while 186 have now been decommissioned or proactively entered into MGAs. This is an addition of 109 bores compared to previously reported (593 bores), as a result of:
 - changes in the development profile;
 - integration of coal mining impacts;
 - changes in water bore information; and
 - additional water bores being identified that were not previously recorded in the groundwater database.
- **108 newly identified immediately affected area (IAA)** bores are likely to be impacted between 2021 and 2024, with 233 IAA bores previously identified in the previous UWIR. The total number of IAA bores to date is now 341.
 - The 108 IAA bores will require follow-up bore assessments by the resource tenure holders (assigned by OGIA for each of these bores based on rules established in the UWIR) to assess impairment of capacity. If a water bore's water supply is likely to be impaired, then the tenure holder will negotiate and implement an appropriate make good measure with the water bore owner.
- A further **361 water bores are predicted to be impaired over the life of CSG industry**. These are referred to as long-term affected area (LAA) bores.
- About **92% of water bores predicted to be impacted are for stock and domestic purposes**. The majority are in the Walloon Coal Measure targeted by tenure holders, or the Springbok Sandstone. Fewer than 1% are in recognised aquifers of the Great Artesian Basin and none are in the Condamine Alluvium.

¹⁵ Page 46 of 'Gas Guide 2.0' (<https://www.gfcq.org.au/resource-hub/the-gas-guide/>) – Make Good

Figure 18. Predicted impacts to water bores in the Surat CMA

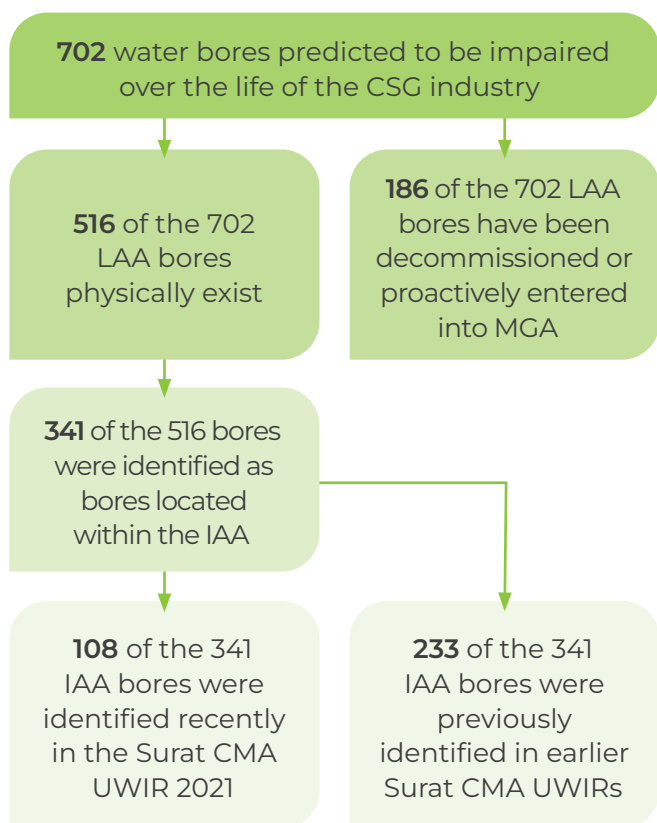


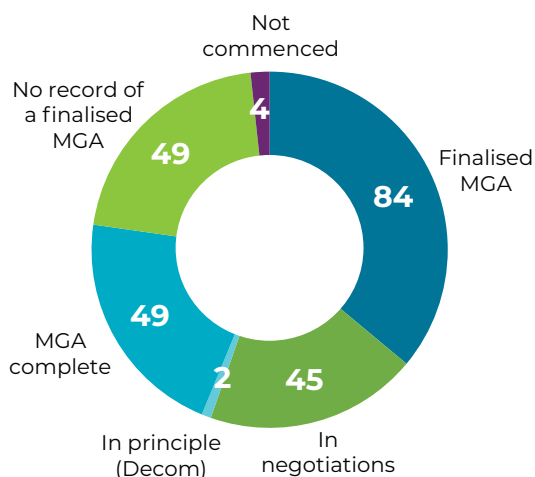
Table 9. Tracking of changes to IAA bores

Period	Added	Removed	Net IAA bores (running total)
UWIR 2012	85	-	85
Post-UWIR	10	25	70
UWIR 2016	57	-	127
Post-UWIR	1	6	122
UWIR 2019	100	-	222
Post-UWIR	13	2	233
UWIR 2021	108	-	341

Of the **233 net IAA bores**:

- Bore assessments have so far been completed for 170 water bores as the first step towards MGAs, while 45 bore assessments are outstanding.

Figure 19. Make Good status of the 233 net IAA bores



- MGAs have been successfully negotiated for 135 of the IAA bores. In some instances, MGAs were reached without bore assessments.

- Make good measures may include one or more elements based on specific circumstances relating to the affected water bore. Types of make good measures include ongoing monitoring, additional local-scale assessment, rework/ modification of existing water bore infrastructure, drilling of a replacement water bore in a non-affected formation, provision of an alternate water supply and financial compensation.

- Make good is currently under negotiation for 45 bores, while 53 are outstanding (not started/no record).
- 117 water bores have so far been decommissioned or agreed to be decommissioned primarily as a result of MGAs.
- A number of supplementary agreements have been signed through proactive initiatives by some resource companies for bores yet to be identified as IAA bores.

The type of MGA is based on individual circumstances. For example, for landholder bores that are distal to current operations, a monitoring agreement may be a suitable make good measure until (and if) impairment occurs. For landholder bores with no capacity, a no impairment (no make good measure) agreement is reasonable.

Details about prediction of impacts for a water bore located within the Surat CMA, including whether the water bore is an IAA or LAA bore, along with magnitude and timing of impacts, is provided by OGIA in a web based '[Bore Search Tool](#)'.

Outside the Surat CMA, underground water impact reports (UWIRs) are prepared by individual resource tenure holders. At the time of writing, 22 have been approved by DES and are available on their [website](#). In other areas where only exploration has occurred to date, UWIR is not required as the activity has not reached the stage of taking associated water during testing.

Groundwater monitoring data provides important information for impact modelling and predictions as part of UWIRs. Consistently obtained groundwater levels and quality measurements over time can provide valuable insights into how particular aquifers

are functioning, and collectively assess the groundwater system. Details of the existing groundwater monitoring networks can be viewed on the [Commission's website](#).

Beneficial Use

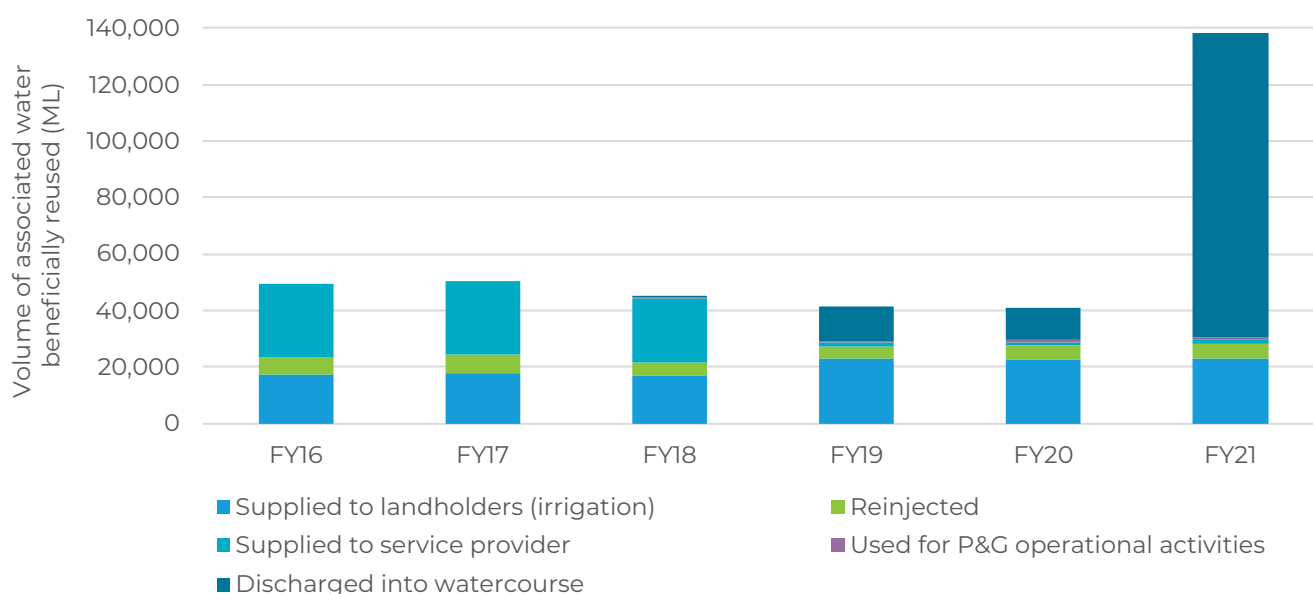
An estimated total of more than 365,000 ML of treated associated water has been beneficially used between July 2015 and June 2021.

Figure 20 shows the distribution of use of associated water over the last six financial years, with the dominant beneficial use being irrigation.

A small portion of associated water is used for purposes such as discharge into watercourses or used in petroleum and gas operational activities.

In FY21 the majority of associated water was treated and discharged into water courses for beneficial use.

Figure 20. Volume of associated water used beneficially for various purposes from FY16 to FY21



03 ECONOMIC AND SOCIAL CONTRIBUTION



In FY21 the gas industry's **direct contribution** to Queensland Gross Regional Product

\$9.3B



For the same period, the gross value of production of Queensland's agriculture sector was

\$18.47B



4,200+
direct jobs in the gas industry



74,000+
direct jobs in the agriculture sector



\$3.51B

spent by the gas industry on local goods, services, community contributions and government payments benefiting:

2,500 local businesses

279 community organisations



Agriculture exports equated to

\$8.54B

complementing LNGs export value of

\$9.51B

PETROLEUM AND GAS, AGRICULTURE SECTOR BENEFITS TO QUEENSLAND

The onshore gas industry is not a short-term guest in the shared landscape with agriculture and rural and regional communities.

The development curve of the gas sector is not fixed, it is constantly evolving; not only within existing areas, but also expanding into new greenfield areas.

The onshore gas industry has grown to become a major contributor to Queensland's economy and provides an increased and diversified range of economic development opportunities in the rural and regional communities in which it operates. This complements the traditional role and significant contribution of agriculture to these communities. The upward trajectory of the gas sector is evolving and expanding, raising new issues for receiving communities. Additionally, the agriculture sector is continuously evolving and adapting to the changing landscape and environment. Both sectors need to grow and interact together, sustainably.

Queensland's agricultural sector and the petroleum and gas industry are world renowned and contribute substantially to the state's function and economy. Both sectors provide essential goods and services to the state.

The agricultural sector provides food, textiles and numerous other products. The gas sector produces fuels that are used for cooking, heating, manufacturing and electricity generation. Agricultural landholders are stewards of the land, with stringent and successful biosecurity risk management programs. These sectors support regional communities through jobs and expenditure. Both sectors are largely export driven, with markets primarily in Asia.

Queensland has the largest area of agricultural land (83%) of any Australian state or territory and the highest proportion of land area in Australia dedicated to agriculture.¹⁶ Petroleum and gas tenures cover 8.6% of the state, but the surface footprint of the sector is much smaller. Petroleum and gas tenures exist in 27 local government areas (LGAs), while commercial agricultural activities occur in almost all LGAs except for some in Cape York.¹⁷

The coexistence between the agricultural and gas sectors fundamentally supports the Queensland economy. The gross value of production (GVP) for agriculture in Queensland was \$14.74 billion in FY21.¹⁸ First round processing for agricultural products added a further \$3.73 billion.

¹⁶ [Queensland AgTrends 2019–2020](#)

¹⁷ [Department of Agriculture and Fisheries – Queensland Data Farm \(Agricultural Exports\)](#)

¹⁸ [Department of Agriculture and Fisheries – Queensland AgTrends](#)

The Gross Regional Product for gas in Queensland was \$9.3 billion in FY21 according to Queensland Resources Council (QRC).¹⁹ It is noteworthy that a number of LGAs with the highest gross value of agricultural production also support Queensland's most productive gas fields.

In FY21, Queensland had the third highest value of agricultural commodities produced of all Australian states and territories.²⁰

In FY21, Queensland had over \$8.54 billion of agriculture exports and \$9.51 billion of LNG exports.

SURAT BASIN POPULATION

Local residents vs non-residents

Sharp increases in non-resident workers can place strains on regional communities. This was previously experienced during the initial CSG development²¹ as a result of CSG workers residing in regional towns that hosted gas development activity. In the current landscape, housing shortages in the Surat Basin local government areas are being attributed to people such as non-resident solar farm construction workers and people moving to the regions due to higher cost of living in cities. Local communities have reported that this is making it difficult for local businesses to secure workers.

A general measure of potential load upon regional communities can be inferred by looking at local residents vs non-residents. Statistics from the Queensland Government Statistician's Office include non-resident workers from all relevant sectors, not just the petroleum and gas industry. The non-resident population is the number of fly-in/fly-out or drive-in/drive-out workers who are living in the area of their workplace at a given point in time and whose usual place of residence is elsewhere. Statistics from the Queensland Government Statistician's Office therefore refer to the number of non-resident workers on-shift at a given point in time, not the total non-resident workforce.

Queensland Government Statistician's Office INSIGHTS

"The non-resident population of the Surat Basin was estimated at 3,625 persons at the end of June 2021, around 365 persons or 11% higher than in June 2020 (Table 10).

Most of the region's non-resident population was located in Western Downs (2,640 persons or 73%) as of June 2021. Around 25% was in Maranoa Regional Council (865 persons or 24%), with the remainder in Toowoomba Regional Council (120 persons or 3%).

The non-resident population of Western Downs Regional Council grew by 585 persons or 29% in FY21, driven by a significant increase in renewable energy project construction and supported by CSG development and operations activity. In Maranoa Regional Council, the non-resident population fell by 210 persons or 20%, with fewer non-resident workers engaged in CSG activity.

The non-resident population of Toowoomba Regional Council was almost unchanged, falling by 10 persons or 9% between June 2020 and June 2021. Compared with the other LGAs, Toowoomba Regional Council has a much smaller non-resident population, which largely comprised workers engaged in CSG activity and power station maintenance, as well as road and rail workers."²²

¹⁹ [Queensland Resources Council](#)

²⁰ [Australian Bureau of Statistics – Value of Agricultural Commodities Produced, Australia](#)

²¹ [CSIRO publication – Local economic impacts of an unconventional energy boom](#)

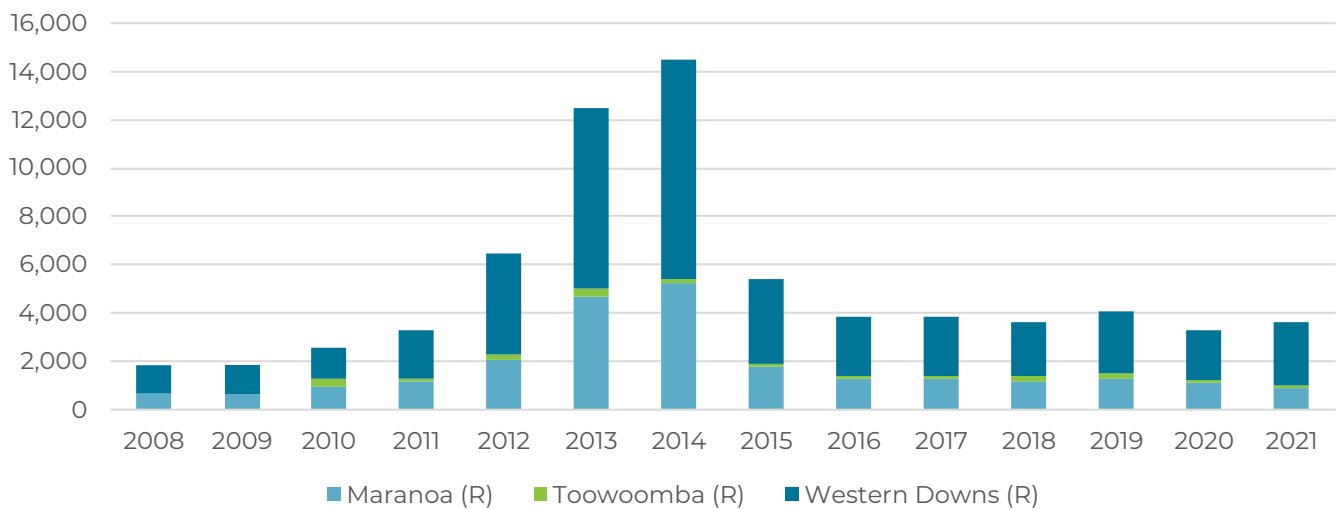
²² [Surat Basin population report, 2021](#)

Table 10. Local Residents and non-residents in the Surat Basin LGAs, as of FY20 and FY21

LGA	2020			2021			Non-resident Change	
	Resident	Non-resident		Resident	Non-resident		Persons	%
	Persons		%	Persons		%		
Maranoa	12,615	1,075	8.52%	12,695	865	6.81%	-210	-20
Toowoomba	170,375	130	0.08%	171,425	120	0.07%	-10	-9
Western Downs	34,750	2,055	5.91%	34,660	2,640	7.62%	585	29
SURAT BASIN TOTAL	217,740	3,260	1.50%	218,780	3,625	1.66%	365	11

Source: Queensland Government Statistician's Office estimates
 Figures in tables have been rounded to the nearest five.

Figure 21. Non-resident population, Surat Basin LGAs as at June



Source: Queensland Government Statistician's Office estimates
 Estimates for 2008 do not include Toowoomba (R). Data for the Surat Basin was not collected in 2009 and estimates are extrapolated from 2008 data.



AGRICULTURAL SECTOR CONTRIBUTION TO QUEENSLAND

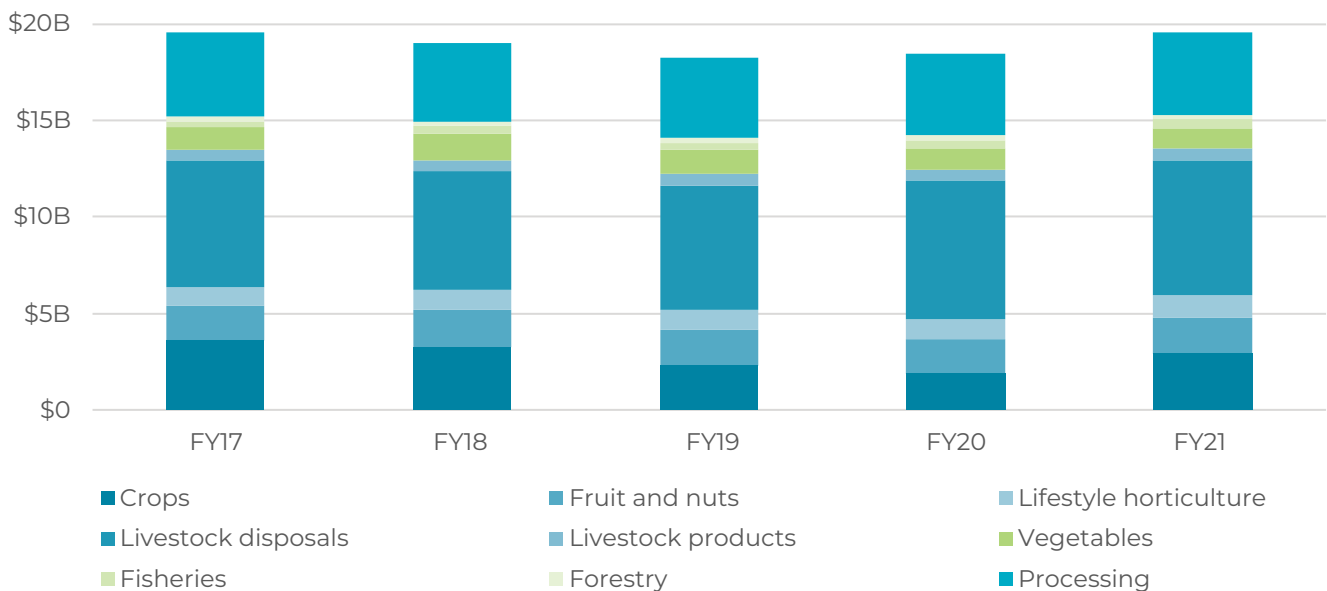
The total value of Queensland's primary industry commodities is made up of two components, the GVP for unprocessed primary commodities, and value of first-stage processing (value-added production). The GVP is the value of recorded production at wholesale prices realised in the marketplace (e.g. cattle sold at saleyards, sugarcane at the mill door, fruit and vegetables at the wholesale market). It is derived by multiplying the output from each primary industry by the average wholesale price paid to producers. The Department of Agriculture and Fisheries (DAF) 'Queensland AgTrends 2020-21 Report' specifies that GVP only relates to the output of primary industry commercial operations.

For simplicity, the following sections of Shared Landscapes specifically focus on GVP for unprocessed primary commodities that are within the agricultural sector, i.e., livestock disposals, livestock products, vegetables, fruit and nuts, lifestyle horticulture, and crops.

In FY21, the GVP to the farm gate in Queensland was \$14.74 billion. First round processing which includes meat processing, sugar processing, fruit and vegetable processing, flour milling and feed processing, cotton ginning, and milk and cream processing adds a further \$3.73 billion in production value for Queensland.²³

The Department of Agriculture and Fisheries (DAF) recorded FY21 as the second consecutive year on year growth in total value of production following declines after the sector experienced one of the worst droughts in over 100 years. Agriculture to the farm gate employed approximately 74,300 people in FY21. While this represented a modest decrease from FY20, the annual average growth rate over the past 5 years is 20.7%.

Figure 22. Gross value of production



²³ [Department of Agriculture and Fisheries - Agricultural exports](#)

Every Queensland resident benefits from the resources sector. Resource royalties help pay for government services like schools, hospitals and roads, as well as police, teachers and healthcare workers. This is in addition to supporting thousands of regional businesses and jobs, and generating export revenue that grows our economy. The people who work in Queensland's resources sector also spend a portion of their wages/salaries purchasing such things as produce that is farmed in Queensland.

It is not possible to track where every dollar generated by the gas industry is spent, but this chapter provides an overview of the gas industry's economic contribution to the State. Queensland's petroleum and gas industry is a significant contributor to the State's economy.

Queensland's Gross State Product (GSP) is an aggregate measure of the total economic production of goods and services, including international and interstate trade, that is reported quarterly.

Much of the data that informs this section has been sourced from the Lawrence Consulting report [Economic Impact of Minerals and Energy Sector on the Queensland Economy 2020/21](#), which was prepared for Queensland Resources Council. In this report, data is reported for commodities according to groupings: coal, coal seam gas/liquefied natural gas, metalliferous, and other (non-metallic mineral mining, including mineral sands, energy generation and magnesia operations). Where data is sourced from the Lawrence Consulting report, the industry referred to is "CSG/LNG" rather than "petroleum and gas".



QUEENSLAND PETROLEUM ROYALTIES

Compared to coal, petroleum royalties make up a smaller share of total royalties, though petroleum royalties have grown strongly as the export industry has matured. Most of the LNG produced in Queensland is sold under long-term contracts linked to oil prices, while the production level of the three major LNG plants is expected to be relatively stable.

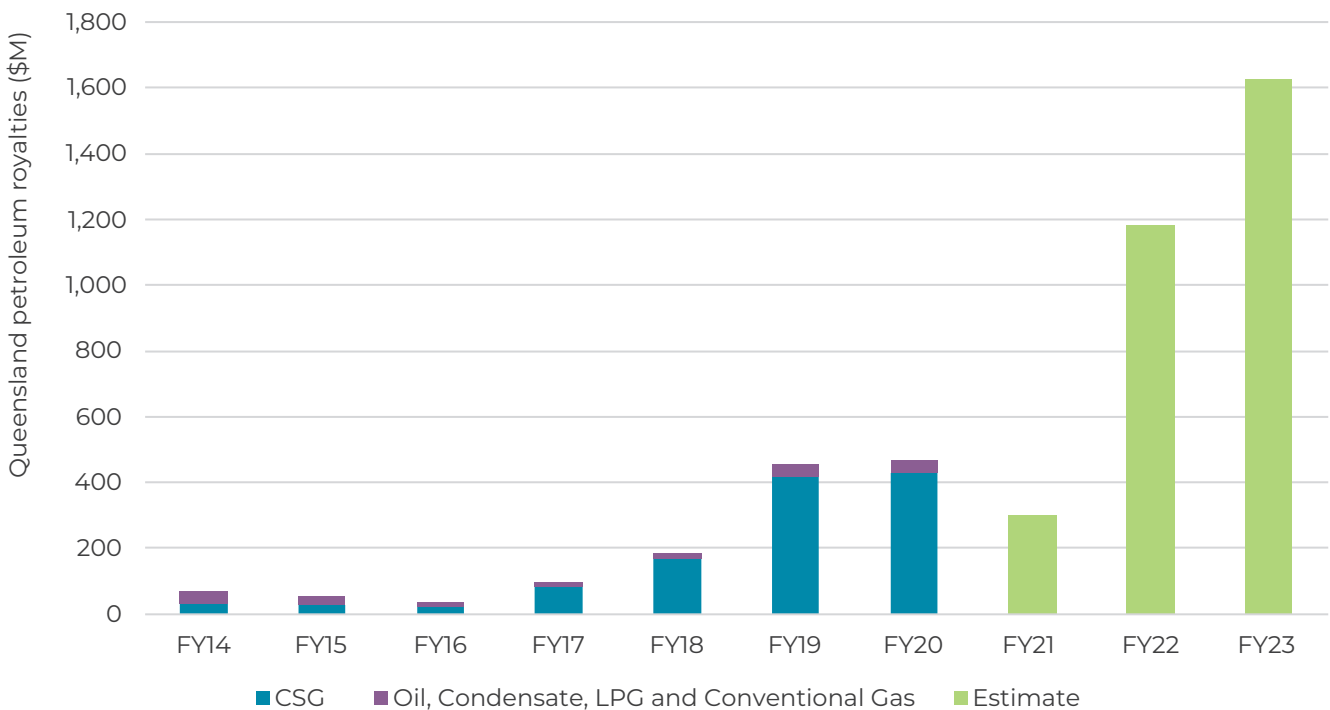
Petroleum royalties (which include CSG, oil, condensate, LPG, and conventional gas) represent approximately 10% of the total royalties collected in Queensland. These royalties are then shared across Queensland’s education, health, transport and roads, and policing sectors.

INSIGHTS

From 1 October 2020, Queensland’s petroleum royalties transitioned to being calculated based on applying a tiered royalty rate to the volume of petroleum produced (rather than the previous system of royalties being calculated as 12.5% of the determined ‘wellhead value’ of petroleum disposed of), with a rate based on the reference price for the producer.

As the industry transitioned to the new royalty calculation method, there was a short term decline in royalties earned from the petroleum sector. Royalty revenue for the FY22 is a total of \$1.184 billion, this is driven by the recent surge in oil prices, which rose from a low of US\$6 per barrel on 21 April 2020 to over US\$100 per barrel in 2022.

Figure 23. Queensland Petroleum Royalties



DIRECT VS INDIRECT JOBS IN THE PETROLEUM AND GAS INDUSTRY

Lawrence Consulting were contracted by the Queensland Resources Council to compile the contribution statistics for Queensland’s oil and gas industry in FY21.

It was established that the gas industry employed 4,246 direct FTEs in FY21, equating to 0.2% of total state employment and \$730 million in wages. Indirect employment was estimated to be 23,044 FTEs, bringing the total direct and indirect employment to 1.1% of total state employment and an additional \$1.99 billion in wages and salaries. It is estimated that the total direct and indirect gas industry wages and salaries for FY21 were approximately \$2.72 billion.

Table 11. Gas industry employment, wages and salaries Queensland in FY21

Employment	Employment (FTEs)	Wages and salaries (\$ million)
Direct	4,246	730
Indirect	23,044	1,993
Total (Type I)	27,290	2,723

Source: Lawrence Consulting ‘Economic Impact of Minerals and Energy Sector on the Queensland Economy 2020/21’

COMMUNITY CONTRIBUTIONS

The petroleum and gas industry invests in the communities in which they operate, and relationships have evolved over the years. In addition to local jobs, spending and procurement, the petroleum and gas industry seeks innovative ways to add value. From the LifeFlight Surat Gas Aeromedical Service, to the Heart of Australia mobile medical program, and the camel races, resource tenure holders support their local communities through various avenues.

However, as previously mentioned, it is not always possible to track and see where every dollar is spent across the State. The data provided below is a summary of where the gas industry is making direct contributions to the LGA in which they operate.

Whilst it has always been an important aspect of the gas industry’s social licence to operate, the data below is intended to demonstrate a wholistic and cumulative representation of the economic contributions the gas industry makes to the LGAs across the State.



Petroleum and Gas Industry – FY21 Direct Expenditure by Region

Queensland's petroleum and gas industry direct expenditure included \$3.1 billion spent on local goods and services, benefiting 2,497 local businesses and 279 community organisations across Queensland.

Table 12. Direct impact of gas industry by region

Region	LGAs mentioned in this report within the region	Residing employees (FTE)	Associated salaries (\$ million)	Number of Businesses	% of total	Business purchases, community & government payments (\$ million)	Total direct spending (\$ million)
Brisbane		2,546	457.7	1,454	58.23%	2,025.4	2,483.1
Central West	Barcoo	n/a	n/a	254	10.17%	8.9	9.2
Darling Downs	Toowoomba, Western Downs	446	72.8	51	2.04%	523.1	595.9
Far North		17	2.4	22	0.88%	10.5	12.9
Fitzroy	Banana, Central Highlands	502	87.7	327	13.10%	181.9	269.6
Gold Coast		131	22.1	3	0.12%	80.7	102.8
Mackay	Isaac	37	5.5	41	1.64%	5.9	11.4
North West		n/a	n/a	62	2.48%	0.1	0.1
Northern		18	3.1	8	0.32%	22.6	25.8
South West	Balonne, Bulloo, Maranoa, Quilpie	115	17.4	44	1.76%	183.9	201.3
Sunshine Coast		233	38.8	182	7.29%	13.1	51.9
West Moreton		33	5.4	47	1.88%	10.6	16
Wide Bay-Burnett		78	13.2	2	0.08%	28.6	41.8

Only for those companies that provided supplier details (n.p. not publishable data). Duplicates were removed to the best extent practicable to ensure an accurate estimation of the number of businesses supported at both state and regional level.

Petroleum and Gas Industry – benefits to local businesses and community organisations

In FY21, the CSG/LNG industry supported 2,497 businesses in Queensland. By far the largest number of these (1,454 businesses supported) were in Brisbane. This was followed by the Darling Downs Region (327), Fitzroy Region (254), and South West Region (182).

The CSG and/or LNG industry made a total of approximately \$3.51 billion in business purchases, community and government payments in FY21.

CASE STUDY: QGC HELPING COMMUNITY GROUPS IN THE WESTERN DOWNS

For the past three years Kate Bradley has helped 157 community groups across the Western Downs region of Queensland gain access to various grants and funding in her role as Community Grants Writer.

Kate's role is funded by Shell QGC's business²⁴ and delivered by the Murilla Community Centre.²⁵ Kate is based across the region's community centres, helping to research, identify and access funding opportunities. She also works with community groups to build their grant-writing capabilities so they can secure additional investment.

Since August 2019, Kate has helped the region reach a significant milestone, with almost \$4.5 million in community grants achieved for the Western Downs region. Some of the successful grants include:

- upgrades to facilities for the [Wandoan Show Society](#);
- a new administration building for the [Chinchilla Polocrosse Club](#);
- securing a ride-on mower for the [Dalby Pioneer Park Museum](#);
- Community Drought Support Program for the [Tara Neighbourhood Centre](#), [Murilla Community Centre](#) and [Chinchilla Family Support Centre](#); and
- traineeship program by [Chinchilla Community Centre](#) for the long-term unemployed and marginalised groups.

\$ Geographic distribution of community groups' successful funding

📍 Number of community groups who have received advice (total = 157)



Kate's focus is on helping community centres/groups identify how to turn priorities into activities, prepare documents, manage budgets and detail what's needed to ensure successful delivery of a project. She has more than a decade's experience developing funding proposals and managing projects from conception through to delivery, most recently at the Queensland University of Technology.

"To be able to help community centres and community groups and contribute to the growth of the region, I couldn't pass it up," she said.

Murilla Community Centre's, Cecily Brockhurst said having access to someone with Kate's experience and expertise was a huge positive.

²⁴ Shell's QGC – KATE'S READY TO HELP COMMUNITY GROUPS IN THE WESTERN DOWNS

²⁵ Murilla Community Centre – Community Grants Writer

“The need for a grants writer came out of community discussions with Shell’s QGC business and it’s great to see them listen and work with us to respond to that need,” Cecily said.

“Community groups are made up of volunteers who often aren’t sure where to start when looking to access funding to support their project. To have Kate available to help build up that capacity is a real win for our region.”

If you’re from a community group from the Western Downs region and are needing some extra help finding a grant opportunity or getting your funding application across the line, contact Kate via: mccmgrants@bigpond.com.



Community Grant writer, Kate Bradley assisting a community group member with their grant application

Table 13. Breakdown (includes community groups and community centres)

26 August 2019 – 30 June 2022	\$ Amount	# Applications
Submitted	\$7,528,075	324
Successful	\$4,499,405	195
Unsuccessful*	\$1,883,261	82
Pending	\$1,145,769	47

CURRENT SUCCESS RATE IS 77%

*Includes 23 applicants that were unsuccessful due to external factors (e.g., COVID-19, applicant unknowingly ineligible, advised disregarded). These are not included in calculated success rate.

COEXISTENCE VIDEO CASE STUDIES



Ali Davenport — CEO Toowoomba and Surat Basin Enterprise

▶ [Play video](#)



Trevor Kehl — Property Owner

▶ [Play video](#)



Rob Fraser — Property Owner

▶ [Play video](#)

04 COMPLIANCE



123 Community reports and company self-reporting of incidents were received by DES in FY21



21 Enforcement actions undertaken by DES in FY21



318 petroleum leases were audited in the Surat and Southern Bowen Basins by the Department of Resources



173 Petroleum and gas enquiries and complaints were received by the Department of Resources since FY21

2181 Petroleum and gas enquiries and complaints have been received by the Department of Resources over the last 9 years



1,209 inspections were performed by the petroleum and gas inspectorate

78 Audits were performed by the petroleum and gas inspectorate

REGULATION OF THE PETROLEUM AND GAS INDUSTRY IN QUEENSLAND

The effective regulation of petroleum and gas activities is essential to ensure that landholders, regional communities, and the onshore gas industry can coexist, with both the benefits maximised and risks managed and mitigated. Regulators have a range of compliance and enforcement options to address non-performance across the petroleum and gas industry.

Petroleum and gas activities in Queensland are regulated by a number of Queensland Government agencies, including:

- Department of Resources (Resources) with respect to tenure and land access;
- Resources Safety and Health Queensland (RSHQ) which is an independent statutory body that regulates the safe operation of the resources sector;
- The Department of Environment and Science (DES) which protects and manages the State's environment and natural resources;
- Department of State Development, Infrastructure, Local Government and Planning (DSDILGP).

These regulating agencies manage and monitor risk through a range of assessment, compliance, investigation and enforcement activities.

Department of Environment and Science

DES's compliance strategy is based on a targeted and transparent approach, supported by a strong and contemporary enforcement capability. DES publishes compliance and enforcement-related information via its Environmental Regulatory Update newsletter.²⁶

Compliance Planning

As part of its compliance planning, DES prepares and publishes its [Annual Strategic Compliance Priorities](#). During FY21, one of the strategic focus areas targeted CSG industry activities in relation to storage, management, and treatment of associated water,²⁷ the re-injection of groundwater, [management of salt and brine waste](#), hydraulic fracture stimulation and air quality monitoring.

The outcome of the compliance and enforcement activities for FY21 are detailed in the [Annual Strategic Compliance Priorities 2020-2021 Report](#) and details specific to CSG can be viewed in the [2020-2021 CSG Compliance and Enforcement Report](#).

90 compliance activities



DES issued 21 enforcement actions where non-compliance was identified from these reports and notifications



²⁶ [Department of Environment and Science - Environmental Regulatory Update newsletter](#)

²⁷ See Glossary – 'Associated Water'

In November 2021, DES released its [annual strategic compliance priorities](#) for FY22. The priorities identify three key focus areas that DES's regional compliance staff include in their work program:

1. Waste management and levy compliance;
2. Coal Seam Gas compliance; and
3. Great Barrier Reef compliance.

Figure 24. The Department of Environment and Science's approach to compliance

DES's **approach to ensuring compliance** with its legislation is to:

- educate individuals, industry and governments about the laws and how to comply with them
- encourage voluntary compliance (see Figure 25) with obligations
- monitor compliance
- reward good performers
- respond to breaches of the legislation with consistent and proportionate enforcement action.

REACTIVE

In response to a complaint or incident.

PROACTIVE

Planned activities including set clear expectations, publishing guidance material and supporting information.

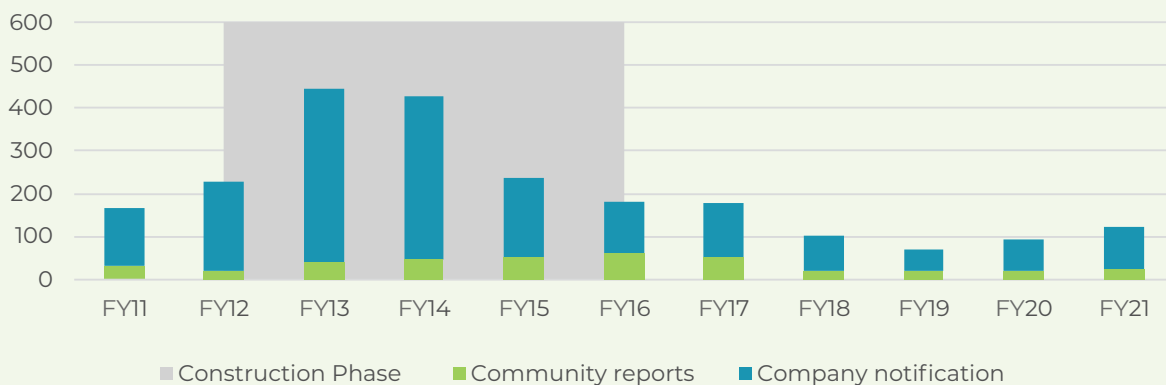
Source: Department of Environment and Science.

It is the responsibility of environmental licence or permit holders to comply with the strong environmental standards and obligations required by law and—where a potential environmental risk has been identified—to have appropriate and effective control measures in place to minimise the potential for environmental harm.



Figure 25. Community reports and resource company notification

Illustrates the number of community reports and resource company self-reporting received since FY11. The reports from resource companies and landholders illustrate a correlation with construction activity for major infrastructure such as pipelines (collection headers, laterals and export), gas processing and water treatment facilities, water storages and construction camps. Many community reports and notifications during the construction or rehabilitation stages involve the disturbance of environmentally sensitive areas, watercourse crossings, and failures in erosion and sediment control measures. These types of reports are occurring less frequently now that the peak construction phase has passed.



Source: Department of Environment and Science.

Drilling of wells and completion activities may result in community reports about noise or light intrusion (environmental nuisance). However, these activities are often subject of a CCA or alternative arrangements between the Environmental Authority (EA) holder and landholders.

Following completion of construction work for major infrastructure items, reports are more likely to relate to associated water released from failed water pipeline valves, vents and well head separators and seals. As resource companies have identified items at higher risk of failure, strategies have been applied to replace those items or implement improved servicing and maintenance procedures to minimise this risk.

Enforcement Measures

Enforcement measures can range from education activities, working with resource companies to rectify potential non-compliance matters and issuing warnings, through to prosecution (details can be found in the [DES Enforcement Guidelines](#)).

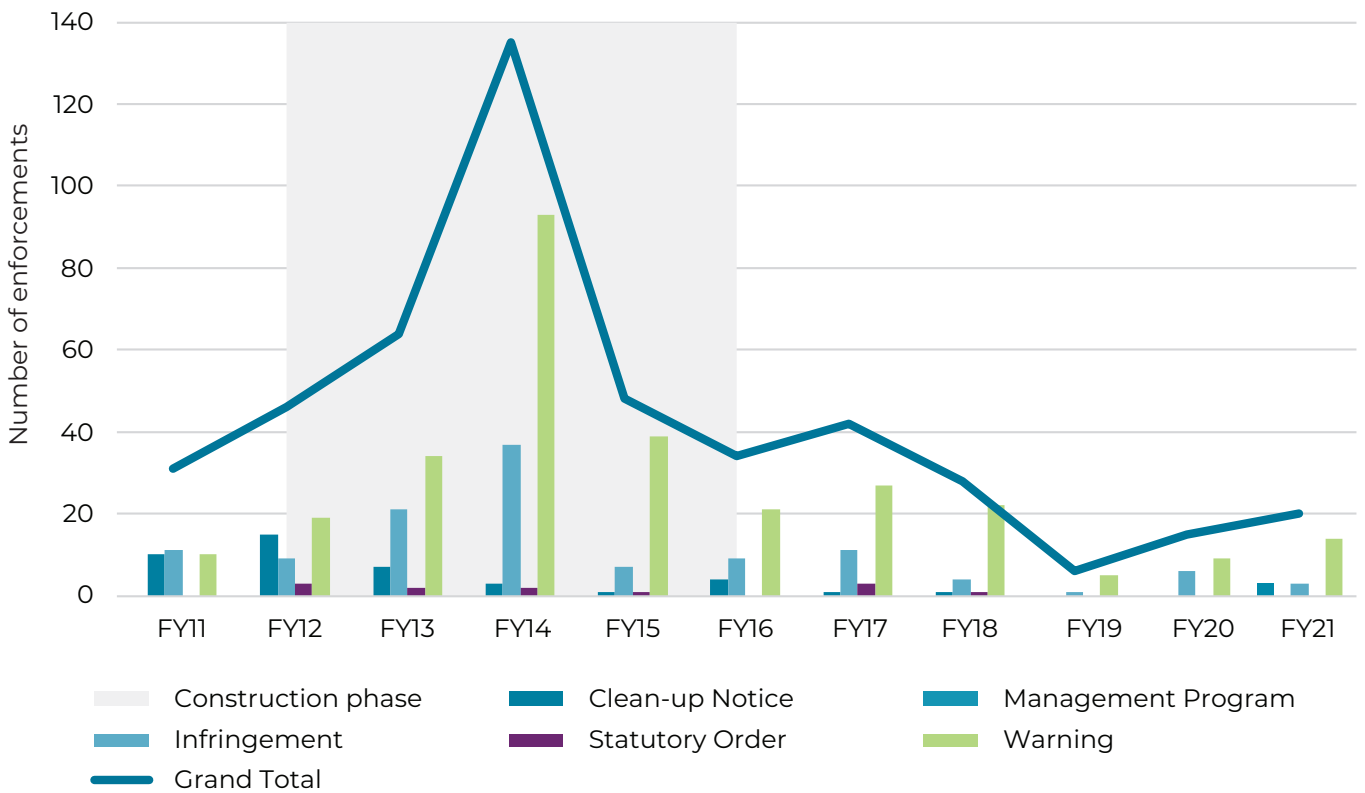
These measures can be used individually or in combination, depending on the nature of the infringement[s] and the outcome sought.

DES has set clear expectations about acceptable standards of environmental performance and can prosecute individuals and/or resource companies who breach their obligations to protect the environment and natural resources when it is in the public interest to do so.

A selection of DES's enforcement actions are summarised in [prosecution bulletins](#) outlining the facts and outcomes of finalised prosecutions. Recently there has been [one](#) prosecution in relation to CSG.

Since 2012, there have been two published prosecution bulletins relating to CSG ([January 2015](#), [September 2018](#)), both relating to offences of contravening a condition of the resource companies' EA. This emphasises the importance of EA holders needing to abide by the appropriate environmental obligations.

Figure 26. Enforcement measures taken by Department of Environment and Science since FY11



The highest frequency of enforcement measures being applied coincides with the peak of industry construction activity (Figure 26), and correspondingly the peak of incident reporting during FY13 (Figure 25). The overall decline in both reports/notifications and enforcements can be attributed to the progression from construction to the commissioning and start-up phase for the CSG upstream facilities of the major LNG export consortiums to the operational phase.

Each of these project teams have identified changes in their activities, from managing many contracts and contractors/employees in the construction phase, to fewer contractors/employees during the operational phase. These changes have coincided with closures of work camps, lay-down areas, and other associated field services. Gas and associated water produced by new wells is now typically processed in existing facilities.

Statutory notices, directions and penalties are usually applied to higher environmental impact, higher culpability, unresolved and more complex or wide-spread issues which, in turn, have become less common as defects from new infrastructure are addressed.



COMPLIANCE – DEPARTMENT OF RESOURCES

Resources administers a range of legislation that forms part of the regulatory framework that manages the use of—and access to—Queensland’s mineral and energy resources. These regulatory frameworks are in place to ensure the laws are complied with.

Resources [compliance framework](#) (the framework) sets out Resources approach to compliance and guides how compliance is delivered consistently and professionally, whilst establishing the principles of how regulatory functions are undertaken. The framework is supported by a [compliance strategy](#), policies, procedures and guidelines.

Each year, Resources takes a risk-based approach to develop a compliance plan to focus efforts ([Department of Resources compliance plan 2021-22](#)), so that the highest priorities and areas of greatest risk are addressed and responses to non-compliance are targeted and proportionate.

Resources has previously released an annual Regulatory Compliance Plan (FY20 and FY21) and associated Report²⁸ that outlines the key compliance achievements over the preceding financial year. In FY21, the plan and report were combined and publicly released as the Department of Resources - Compliance plan report 2020-21. Compliance outcomes for these plans are shown in the **Compliance Outcomes Table**.

The focus and targeted compliance activities for FY22²⁹

Target for Petroleum and Gas:

Audit performance of all petroleum production leases in the Surat and southern Bowen basins using the Petroleum Lease Compliance framework.

Activities include:

- undertaking proactive desktop audits including audits of production reporting for petroleum leases;
- undertaking proactive field inspections;
- providing reactive, targeted responses to incoming complaints and intelligence from external sources; and
- undertaking performance audits for petroleum and gas production leases.



²⁸ [Department of Resources – Compliance plan report 2020-21](#)

²⁹ [Department of Resources – Compliance plan 2021-22](#)

Table 14. Compliance outcomes over FY20 and FY21

Action	FY20	FY21
<p>Enhance compliance with permit conditions on existing tenures</p> <ul style="list-style-type: none"> Proactive desktop audits including audits of production reporting for petroleum leases Proactive field inspections Reactive, targeted responses to incoming complaints and intelligence from external sources Performance audits for petroleum and gas production leases. 	<ul style="list-style-type: none"> All petroleum production leases in the Surat Basin and southern Bowen Basin were audited equating to 311 performance reviews of production leases. The production leases produce over 90% of the state's gas. As part of the performance reviews, 10 potential compliance matters were identified for further analysis: <ul style="list-style-type: none"> Seven of these potential non-compliances related to low or no production and/or development, which can reflect an ineffective use of the tenure and resulting loss of benefits to Queenslanders. The department investigated these potential non-compliance matters and sought further information from the holders. As a result, the department was able to establish that these holders were in substantial compliance with their tenure conditions and no further action was required. 	<p>Of the 318 production leases audited across Queensland:</p> <ul style="list-style-type: none"> 41 audits (12%) required further investigation. 19 audits (6%) identified potential non-compliance due to issues relating to no production activities carried out as proposed. 4 information notices were issued to address non-compliance.
<p>Improving land access systems and operations of junior resource companies</p> <ul style="list-style-type: none"> Review land access systems and protocols and provide best practice advice to targeted small and junior exploration companies. Reactive, targeted responses to incoming complaints and intelligence from external sources about land access. 	<ul style="list-style-type: none"> Five audit processes progressed (performance measure of five). The audits allowed us to review the procedures and documentation that the small and junior exploration companies have in place and provide feedback to improve their systems, processes and land access practices. 	<ul style="list-style-type: none"> As part of Phase 1 of the Small/Junior petroleum explorers' program, three junior petroleum and gas explorer audits were completed. No non-compliance breaches were identified.



Reactive Compliance: Enquiries and Complaints

The Engagement and Compliance Unit (ECU), a business unit of Resources, deals directly with enquiries and complaints made about mineral and energy resource activities in Queensland, including petroleum and gas activities. A total of 2,181 petroleum and gas enquiries and complaints were received by ECU over the last nine years.

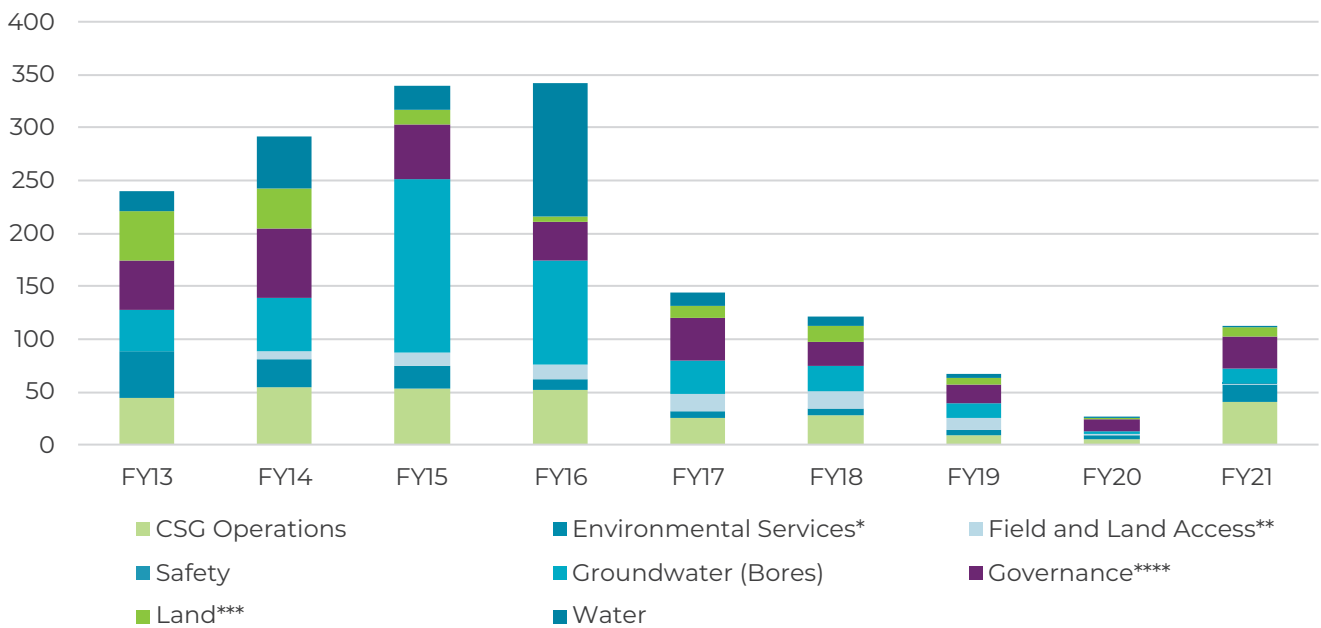
The following is a summary of data related to petroleum and gas enquiries and complaints reported and managed by the ECU.

Table 15. Enquiries and complaints over FY20 and FY21

FY20
<p>Since FY19, the ECU has received 122 petroleum and gas enquiries and complaints.</p> <ul style="list-style-type: none"> ■ The most common subjects of enquiries relate to groundwater impacts, community engagement and communication. ■ The most common subjects of complaints were related to land access agreements, environmental nuisance, land access and safety. ■ There was a total of 28 petroleum and gas complaints received by ECU during FY19 and FY20: <ul style="list-style-type: none"> □ 21 complaints resulted in no compliance/enforcement action following the provision of further evidence and were concluded with advice to the complainant; □ ECU facilitated three formal dispute resolution conferences between the complainant and the resource authority holder to address concerns raised; and □ four complaints were referred to other Queensland Government agencies. ■ As of 30 June 2020, all outstanding enquiries and complaints had been resolved.
<p>Since FY13, the ECU has recorded a decline in petroleum and gas-related enquiries and complaints resulting from several inter-related factors.</p> <p>During this time, the CSG industry has transitioned from the construction to the operational phase; and concurrently, a maturing of industry practices and supporting regulatory framework has resulted in improved standards and fewer complaints.</p> <p>From FY15 to FY20, the ECU has recorded a steady decline in enquiries and complaints related to petroleum and gas, whilst also noting a shift away from high frequency/low complexity enquiries and complaints to those that are generally more complex in nature and require multi-agency input and liaison.</p>
FY21
<p>In FY21, the ECU received 172 petroleum and gas enquiries and complaints, bringing the total petroleum and gas enquiries and complaints received by ECU over the last nine years to 2,181.</p> <p>The most common subjects stemming from enquiries over the last two financial years were governance and CSG operations. The most common subjects in complaints were related to CSG operations and land.</p> <p>As of 30 June 2021, there were six active enquiries and complaints, which were received in FY21 and being dealt with in the relevant timeframes attached to their priority and complexity.</p> <p>The increase in enquiry and complaint activity in FY21 is directly linked to the increase of deviated drilling occurring in the Surat Basin³⁰ as part of production leases. To provide further clarification for tenure holders and landholders regarding rights and responsibilities, Resources published a factsheet in August 2021; Considerations when accessing private land to carry out directional drilling on adjacent land. The factsheet sets out the regulatory framework for resource authority holders to access private land to carry out directional drilling activities on adjacent land and landholder rights that apply in that scenario.</p>

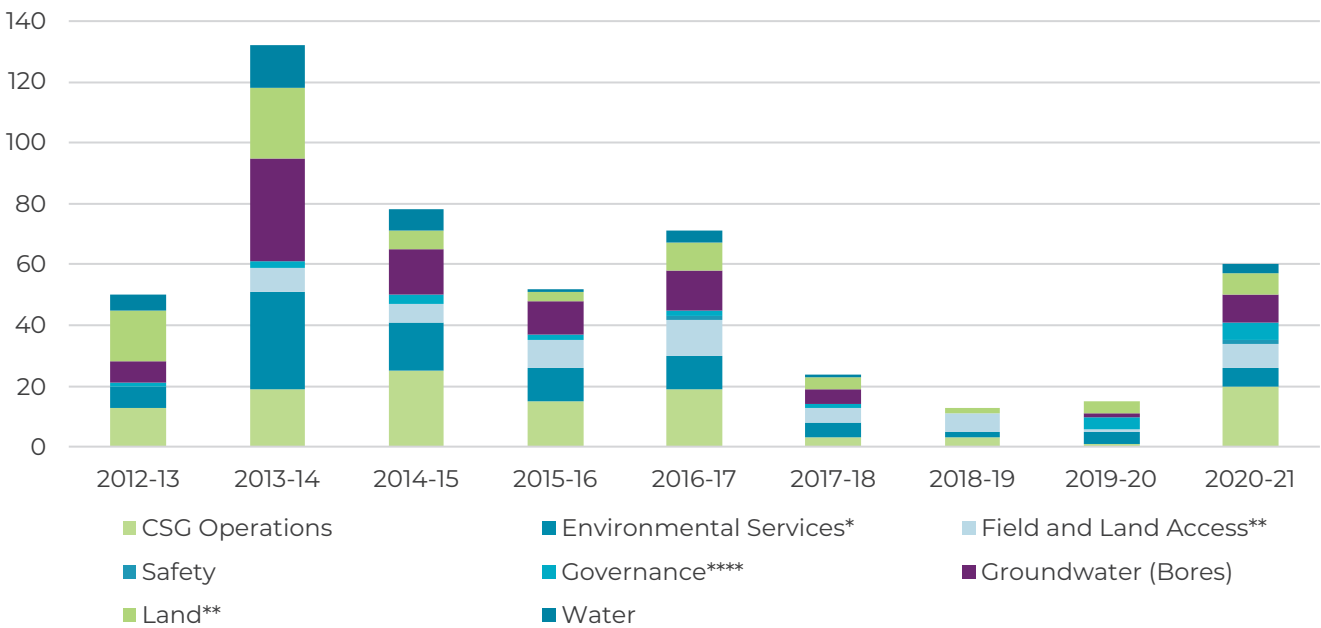
³⁰ [Department of Resources 'Directional Drilling' fact sheet](#)

Figure 27. Enquiries received by Georesources' Engagement and Compliance Unit



Source: Department of Resources

Figure 28. Complaints received by Georesources' Engagement and Compliance Unit



Source: Department of Resources

* Environmental Services: referrals to Department of Environment and Science

** Field and Land Access: includes property entry and access issues and the land access code

*** Land: includes cultural heritage, erosion and vegetation clearing

**** Governance: includes, but is not limited to, matters concerning legislation, regulatory framework, government initiatives, public reports and communications.

It should be noted the department managed water during the period of reporting as the Department of Natural Resources, Mines and Energy. Following machinery of government changes in late 2020, water is now managed by the Department of Regional Development, Manufacturing and Water.

Alternative Avenues for CSG-related Enquiry and Complaints

Stakeholder awareness and understanding of the petroleum and gas industry has also matured, with communities and industry becoming better informed through the effective delivery of engagement and compliance initiatives by the ECU, other government agencies, private organisations, and the gas industry itself.

As a result, information is now more readily available and stakeholders are better informed, consulted and supported regarding petroleum and gas activities. Additionally, industry and community now have better access to alternative dispute resolution and enquiry services through the Commission and the Officer of the Land Access Ombudsman (LAO).

COMPLIANCE – PETROLEUM AND GAS INSPECTORATE

The Petroleum and Gas Inspectorate (the Inspectorate) is part of RSHQ, an independent statutory authority established on 17 March 2020. It has adopted a risk-based approach to regulate workplace health and safety across the resources sector, including the petroleum and gas industry. RSHQ carries out a compliance assurance program each year that may cover all aspects of safety and health in upstream operations. The Inspectorate uses its analysis of risks to inform its compliance plan and to identify specific focus areas. It also publishes newsletters, annual reports, and other important updates. The Inspectorate engages with industry and stakeholders to educate them on its findings, and to promote better industry practices.

The Inspectorate publishes newsletters, annual reports, and other important updates about the sector in Queensland. The Inspectorate also publishes [safety alerts, instructions and bulletins](#) to raise awareness in the industry.

RSHQ publishes [quarterly compliance data](#) online on the number of audits, inspections and complaint investigations that have been conducted across the petroleum, explosives, mining and quarrying sectors.

Table 16. Petroleum and Gas Compliance Data

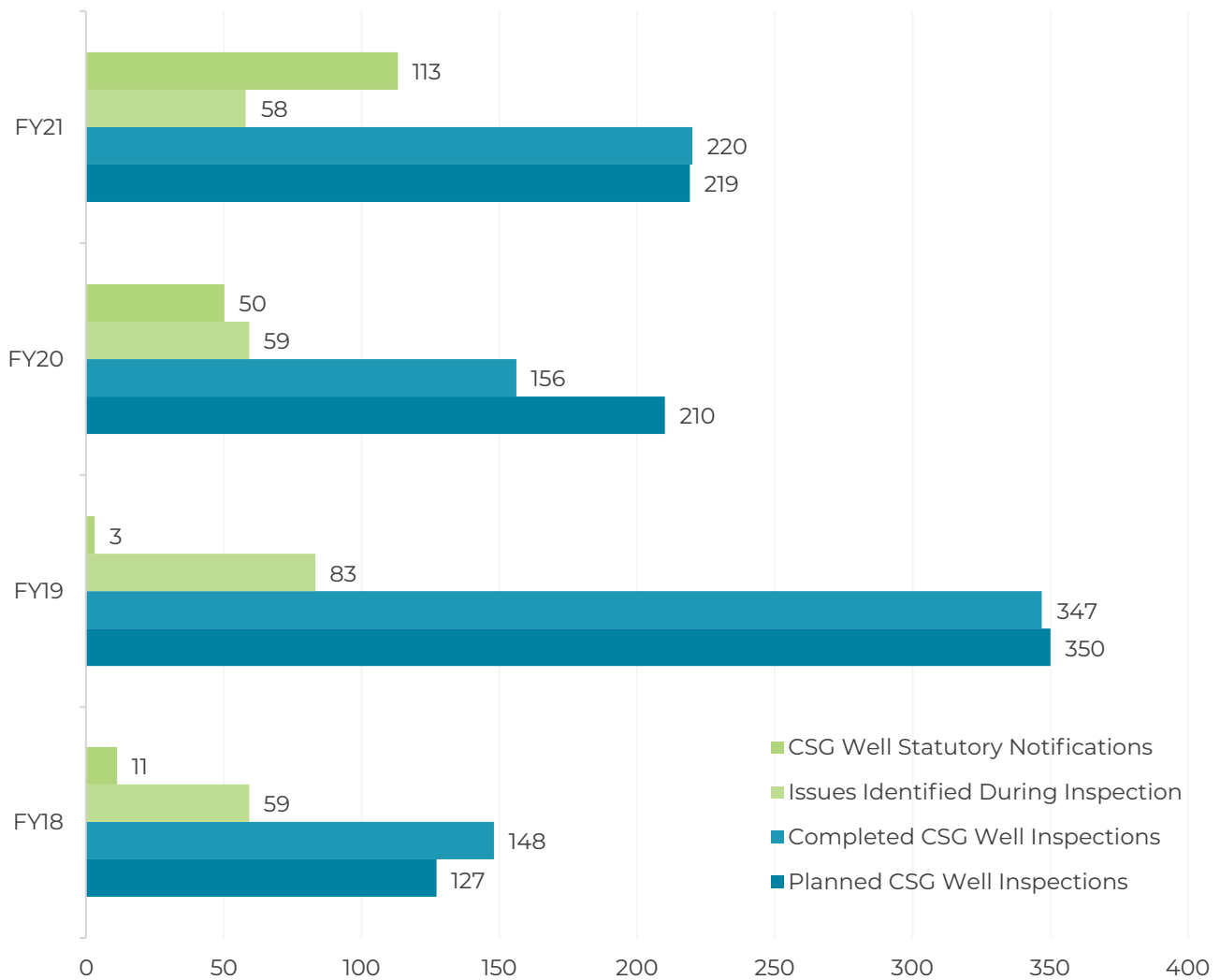
Financial Year	Inspection (plan)	Inspection (actual)	Audit (plan)	Audit (actual)	Compliant Investigations*
FY20	1,079	1,145	67	58*	219
FY21	1,200	1,209	75	78	207

* Impacted by COVID-19 and rescheduled in FY21

During FY21 period, 20 of the 78 audits were conducted as part of the petroleum well regulation. The focus of these audits was grouped into the following high-risk areas; Leak management (8 audits), abandonment (8 audits), hydraulic fracturing (3 audits) and well integrity management systems (1 audit).

CSG WELL SPECIFIC COMPLIANCE DATA

Figure 29. Overview of CSG well compliance under the construction and abandonment code of practice through FY18, FY19, FY20 and FY21



Source: Resources Safety and Health Queensland.

Figure 29 does not include “Other” wells (i.e. conventional and non-CSG unconventional)



Number of CSG Well Statutory Notifications

During FY21, there were 37 notifications for failure to meet cementing objectives and 76 well integrity notifications which are a new requirement in the latest version of the construction and abandonment code of practice.

During FY20, there were 31 notifications for failure to meet cementing objectives and 19 well integrity notifications which are a new requirement in the latest version of the construction and abandonment code of practice. Some of the increase is due to operators proactively re-interpreting and re-reviewing cement bond logs and some of the well integrity notifications are for issues that occurred before the requirement came in but operators decided to report anyway.

As per the Brady Review (Brady 2019), RSHQ and the Inspectorate encourage open reporting and wish to facilitate a reporting culture to help control hazards and reduce risks. Incident reporting, especially for high potential incidents, can help ensure early warning signals of impending incidents are captured and disseminated to industry. Additionally, it will provide the best opportunity to identify hazards before they cause harm and ensure they are effectively controlled (Brady 2019). An increase in the number of well-related notifications is not seen as an issue in itself but as a positive that industry is identifying and reporting incidents.

The main cause of the change was due to increases in the well integrity notifications and reportable leaks, with contributing factors being:

- the increasing number of operating wells;
- improvement in operators' systems which has resulted in the capture and reporting of more well integrity matters; and
- one operator has had ongoing issues with well skid components, which led to a significant number of reportable leaks. The investigation and rectification of this issue is ongoing.

Number of CSG Well Completed Inspections

During FY21, issues ranged from areas for improvement around general housekeeping and signage through to leaks on 12 of the 220 CSG wells inspected, the requirement for additional monitoring under the operator's well integrity and leak management systems,³¹ and remediation to rectify non-compliant equipment on a very small number of wells.

During FY20, issues ranged from areas for improvement around general housekeeping and signage, through to some leaks and the requirement for additional monitoring under the operator's well integrity management system.

Outcomes

All non-compliance issues were either resolved or an action plan is being implemented and the Inspectorate is being updated on the progress.

The Inspectorate undertook enforcement actions in line with the Resource Safety and Health Compliance Policy. Issues were communicated to operators along with requests for them to rectify the identified non-compliances.

Non-compliances have since been closed out by the Inspectorate.

In addition, some areas will have follow-up work in the next 12-24 months

³¹ See Notifications – Leak management

Notifications – Leak Management

Leak management notifications are not part of the well integrity or failure to meet cementing objective notifications. There are three relevant well notifications that operators are required to make:

1. a well integrity notification which is required under the construction and abandonment code;
2. failure to meet cementing objectives which is required under the construction and abandonment code; and
3. leak notifications which are required under the leak management code.

Leak notifications under the leak management code³² are also required for other operating plants such as gathering systems and facilities in addition to wells. For more information, please read [Leakage management for petroleum producers](#).

Inspections – Hazardous Areas

The Inspectorate, in conjunction with SIMTARS, has completed hazardous area inspections. The inspections occurred in the Surat Basin on petroleum tenures with the work focusing on different operating plants, including wells and facilities.

The inspections reviewed hazardous area dossiers and visual inspections of electrical equipment to ensure it was consistent with the operator's documentation. The inspections found equipment was well maintained with some minor updates required to a dossier and an ex-equipment register.

LAND ACCESS OMBUDSMAN

The Land Access Ombudsman (LAO) opened in September 2018 with specific functions to investigate alleged breaches of Conduct and Compensation Agreements (CCAs), Make Good Agreements (MGAs) and make practical recommendations to resolve disputes.

Their jurisdiction is summarised below:

✓ Matters the LAO can investigate

Investigate matters referred to the LAO when the party:

- has an existing CCA or MGA;
- reasonably believes the other party is not complying with their obligations under the agreement; and
- has already made a reasonable attempt to resolve the issue.

✗ Matters the LAO cannot investigate

The LAO cannot investigate:

- when the CCA or MGA is still under negotiation, or subject to a minimum negotiation period or cooling off period;
- the content of legislation or government policies;
- a decision made by Cabinet, a Minister, or a chief executive of a government department;
- a matter that is, or has been, the subject of a court proceeding or an arbitration;
- a matter that is, or has been, the subject of an investigation by a department;
- compensation agreements for mining leases and mining claims under the Mineral Resources Act 1989;
- access agreements; and
- matters outside Queensland.

The LAO's annual reports³³ provide further insight into their operations, performance and achievements for each financial year.

³² [Petroleum and Gas Inspectorate – Code of Practice - For leak detection, management & reporting for petroleum operating plant](#)

³³ Office of the Land Access Ombudsman – Annual reports

The below 'LAO Enquiries Received' Table highlights the number of enquiries related to **all resource activities** (petroleum and gas related activities are shown in **brackets**), that were received by the LAO since operation commenced on 14 September 2018, up to the end of FY21.

Table 17. LAO Enquiries Received

	FY19 (commencing 14 Sep 2018)	FY20	FY21	Total to FY21
Enquiries Received	17	23	47	87
Investigated	2(2)		1(1)	
Referred to relevant agency	13	19	36	
Preliminary enquiries conducted			5(5)	
Non-dispute related enquiries			2	
Others	2	4	3	

In FY21, 3 of the enquiries about a possible dispute referral received concerned petroleum and gas related activities. Of these, 1 was investigated and 2 had preliminary enquiries conducted.

Themes of Enquiries Received by the LAO

FY19

During FY19, investigated dispute topics included:

- biosecurity concerns (mainly weed and washdown compliance);
- outstanding rehabilitation or rectification works;
- rubbish and used materials left on property without the landholder's consent; and
- gate and access conditions.

FY20³⁴

During FY20, themes in dispute that were out of LAO's jurisdiction included:

- being related to resource industry activity on rural land, but there being no CCA or MGA in place;
- disputes over use/ownership of easements and bodies of water; and
- complaints about telecommunications workers accessing private land.

FY21³⁵

During FY21, investigated disputes included:

- transfer of a petroleum licence, concerns about biosecurity and public liability insurance.

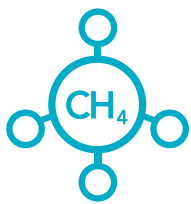
Themes in dispute that were out of LAO's jurisdiction included:

- disputes over ownership, land value or access to land;
- compensation agreement for mining leases and claims under the [Mineral Resources Act 1989](#);
- dissatisfaction with a decision made by a government department (Resources or DES);
- disputes about issues on a neighbouring property;
- complaints about telecommunication services on properties;
- assistance with the negotiation of a CCA or MGA;
- negotiation of an access agreement for a windfarm;
- breaches of EAs;
- resource activities on neighbouring properties;
- disputes between owners of a mining lease;
- disputes over use or ownership of easements;
- disputes regarding a Deferral Notice;
- local council complaint;
- seeking assistance in finding out who owned land; and
- seeking payment for costs incurred when CCA negotiation was not completed.

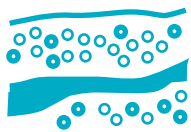
³⁴ See 'LAO Enquiries Received' Table – FY20

³⁵ See 'LAO Enquiries Received' Table – FY21

05 SUPPLY AND DEMAND



1,505 PJs
of gas were produced in
Queensland in FY21



97.1%
or 1,376 PJ was CSG



91.4%
of all gas produced in
Queensland during
FY21 was used to
produce LNG



1,316 PJ
of gas was exported as LNG

PETROLEUM AND GAS PRODUCTION OVERVIEW

With the world's energy supply chains still experiencing disruption as a result of the COVID-19 pandemic and the global energy mix rapidly changing to accommodate more renewable energy and less coal-fired generation, the demand for gas remains strong.

The International Energy Agency's (IEA) [Q1 2022 Gas Market Report](#) for the 2021 calendar year (CY21) saw the international gas market rebound by 4.6% globally, more than double the decline seen in CY20. Global supply shortages led to tight markets and steep price increases, putting the brakes on demand growth in the second half of 2021.

Queensland's key buying region for liquefied natural gas (LNG), Asia, saw record-high spot prices and a strong recovery in the LNG trade with an increase of 7% on the previous year and is projected to increase by a further 5% in 2022.

Locally, gas use in Australia's eastern and south-eastern gas sectors continues to transform, predominately due to the changing mix of electricity generation.

Despite low quarterly use of gas for power in the National Electricity Market (the NEM) in late 2021, the first 5 months of 2022 saw a 38% increase due to the displacement of coal by renewables, leaving gas-fired power generation to fill the void.

In the next few years, the Australian Energy Market Operator's (AEMO) gas-fired power generation is predicted to be higher because of planned closures and unplanned outages in coal-fired power generation.

The Australian Bureau of Statistics (ABS) national average domestic wholesale gas price index increased by 31.9% and 9.3% between the last quarter (Q4) of CY21 and Q1 CY22. Continued price spikes may have influenced a change in use through alternative means, such as the Victorian Government's desire to move residential users away from gas for heating and cooking through electrification.³⁶

While price spikes have not led to a decrease in demand, continued spikes may accelerate the establishment of new infrastructure to help lessen future fluctuations in price. This new infrastructure may include upgrades to pipe and storage networks that would allow more gas to flow to where and when it is needed, and increased renewable energy storage options to relieve pressure on gas-fire electricity generators.

AEMO's [2022 Gas Statement of Opportunities](#) forecasts gas to continue to play a critical role in the NEM, especially as coal-fired power generation is reduced, with gas-fired power generation predicted to support and firm variable renewable energy based power generation.

While CY21 saw a continued decline in gas consumption for electricity generation to just over 98 petajoules (PJ) due to the uptake in renewables, gas-fired power generation is still forecast to provide critical dispatchable capacity, particularly due to the fact that several of the NEM's coal-fired power generators are set to retire in the coming years.

For residential and commercial use in applications such as heating, hot water and cooking, the use of gas has remained steady but is forecast to decline, primarily due to electrification.³⁷ Despite a small decline, gas remains crucial for household heating in the southern states during the winter months.

As a feedstock for industrial consumption such as large-scale mineral processing, mining, manufacturing and large food processors, the demand for gas has remained consistent. It remains as an irreplaceable key ingredient in chemical manufacturing, such as nitrogen-based fertilizers.

With supply from southern states expected to decline as existing resources are exhausted and less new resources being proven, traditional east coast buyers will likely be looking to Queensland and the Northern Territory as the main sources of alternative supply.

2022 EAST COAST WINTER ENERGY CRISIS

June 2022 saw a number of factors align resulting in extremely high energy prices for both electricity energy and gas. This was due to a combination of unusually lower temperatures across the eastern seaboard resulting in increased household demand for both electricity and gas for heating purposes, high global commodity prices and reduced coal-fired generation. This ultimately resulted in a decreased energy supply and higher wholesale energy prices.

To ensure supply came at a reasonable cost to consumers, AEMO intervened, capping the price power generators can sell to the NEM.³⁸ Due to the high costs of supplying electricity, some operators were forced to cut supply. As a result, AEMO directed all power generators to maintain supply, with the regulator supplying financial compensation.

The Australian Government is now working with state governments to ensure reliable supply at reasonable prices whilst also considering implementing a 'capacity mechanism',³⁹ which could see some power generators being paid to stay online, rather than needing to operate in the spot market.

Regardless of the outcome, a reliable and plentiful supply of gas remains crucial to Australia's east coast for the generation of electricity, heating and as an industrial feedstock for the foreseeable future.

³⁶ [Victoria's Gas Substitution Roadmap](#)

³⁷ [AEMO – Gas Statement of Opportunities, March 2022](#)

³⁸ [AEMO – "7am Update: Price caps administered across multiple states"](#)

³⁹ [The Hon Chris Bowen MP - Minister for Climate Change and Energy – Press conference on the Energy Ministers' meeting](#)

WHAT IS A PETAJOULE?

A petajoule is a measure of energy.



The energy used by **19,000 homes in a year.**

The average home used approximately 50 gigajoules of energy in 2014–15



The electricity used by **868,000 refrigerators in a year.**

A typical 2.5 star fridge uses 320 kWh of electricity per year



The electricity used by **2,354,000 televisions in a year.** A 50 inch 5 star label television uses 320 kWh of electricity per year

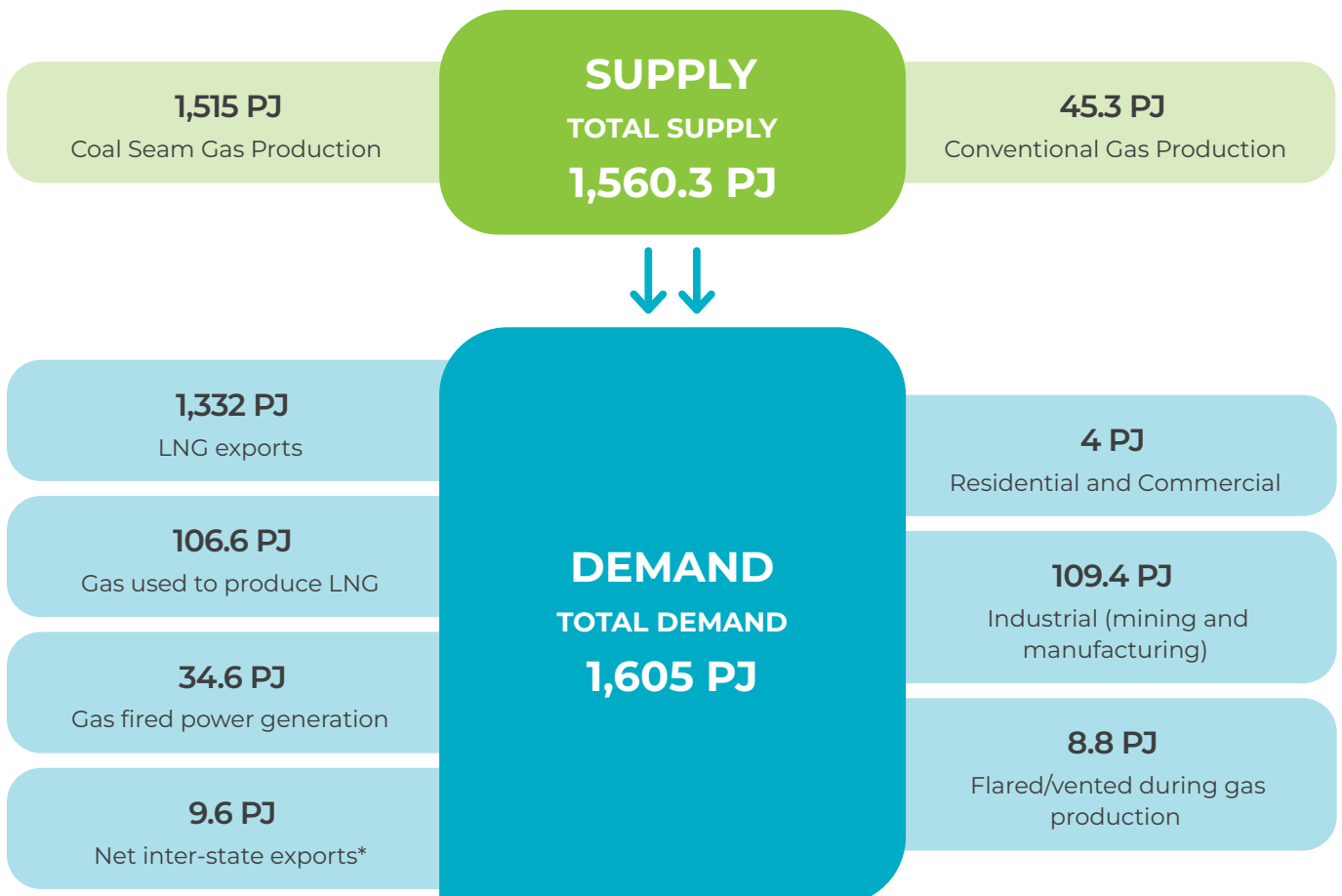
INSIGHTS

92.2%

of all gas produced in Queensland during FY21 was used to produce LNG, of which 1,316 PJ (91.4%) was exported.

1,505 PJ

of gas was produced in Queensland during CY21, of which 97.1% was CSG.



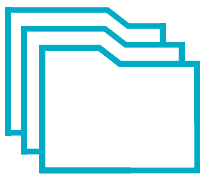
06

LOOKING FORWARD



810,300 ha

of petroleum and gas tenures granted **must supply the Australian domestic gas market**



Since 2016, there have been

11 tender releases



Of the 7.01 million ha released, around

30% has been awarded for exploration

The petroleum sector in Queensland is not a new industry. Commercial operations commenced in the 1960's in the Cooper Basin and Moonie oil fields. However, the concept of converting CSG to LNG was a world first and led to the emergence of the CSG to LNG industry in Queensland, approximately 10 to 15 years ago. The early years of the CSG to LNG development were marked by tensions and friction between landholders, the community and the gas sector.

The CSG to LNG developments presented many unknown elements as the industry went through the evolutionary process from concept to delivery of first gas. A wealth of research and knowledge has been acquired over the past decade with many learnings along the way.

As this report has highlighted, the petroleum sector provides an important economic and social contribution to the Queensland economy and the industry has presented many opportunities to regional communities. Whilst the gas industry may not be the largest contributor to Queensland economy, it is a significant one with its contribution woven into the tapestry of the overall economic performance of the State. Some regional communities have embraced the economic diversification that the CSG to LNG industry has presented. However there are opportunities for the petroleum industry, regional communities and government to work together to ensure the benefits are realised for decades to come.

The challenges of the past may not necessarily be the challenges of the future. One of the greatest challenges and opportunities that the industry and regional communities will need to face is the long-term prosperity of regional communities and the enduring beneficial legacy that the gas industry will leave behind once gas production has ceased. Additionally, the gas industry needs to ensure that the benefits are realised in the long term to avoid being perceived as a short-term guest.

Whilst the long-term benefits are not a topic of this report, it is a consideration that this will be explored in further publications. The aspirational and achievable outcomes for regional communities and the gas industry would be the development of long term, partnerships arrangements to foster resilient, sustainable, diverse and prosperous regional economies.

According to AEMO, eastern and south-eastern Australia is on the cusp of transformation, with changes in consumption patterns forecast and alternative supply sources being actively developed.

With the adoption of emissions targets having a transformative impact on the nation's gas industry, gas is expected to continue to play an important role in the generation of electricity, particularly to complement the steady uptake in variable sun and wind renewable energy generators as well as to fill generation gaps as coal-fired power stations retire.

The need for gas and land releases

There is little doubt that economies of the developed world are experiencing a rapid uptake of electrification and renewable energy into energy networks. Despite this rapid uptake, experts such as the IEA are reporting that the rate of transformation to an electrified future cannot be supported by renewable energy alone. The use of gas as an energy source is one means of supporting this transition as we globally move to a renewable, low carbon emissions future. Therefore, the current forecasted demand for gas as part of the global energy mix will remain strong in the immediate term.

In addition—and closer to home—the Queensland Government's "*Queensland Resources Industry Development Plan*" states that gas will continue to play its part to support the transition to a renewable energy future and would assist the stability and reliability of the electricity network. The plan also highlighted that demand for gas as a manufacturing feedstock is an important factor when considering the ongoing demand for gas, in both domestic and international markets.

For the gas industry to continue to thrive in a changing world, the evolution of coexistence will need to consider the multi-faceted aspects of community expectations such as the environmental, social and governance (ESG) factors, community expectations of a decarbonised energy future, technological advancements and changing government regulations.

Over the last decade, the majority of gas development activity has been focused in the Surat Basin. However, as the industry matures and technology changes, new and emerging areas have the potential to become gas producing regions. It is anticipated that the scale and intensity of development experienced in the Surat Basin will not be seen again in these emerging areas. Also, the emerging areas have not been explored to the same extent as the Surat Basin and therefore it is likely that it will be several years if not decades before production activities commence.

The emerging areas are considered to be:

- Galilee Basin
- Adavale Basin
- Expansion of the Denison Trough (near Rolleston)
- Southern end of the Northern Bowen Basin (between Blackwater and Banana)
- Tight gas reserves in the Taroom Trough (between Moonie and Roma).


In addition to the emerging areas, the Queensland Government has released areas for tenure via a competitive tender process where there has been very little gas activity. These areas can be referred to as frontier basins and include:

- The South Nicholson Basin (which forms part of the Isa Super Basin)
- Millungra Basin

Due to the ongoing role that gas plays in the energy market and as a feedstock for the manufacturing sector, the Queensland Government has committed to ensuring the gas industry continues to develop, and as such, the government periodically [releases new areas for gas exploration and development](#).

During the land release process, the Department of Resources engages with directly affected landholders and notifies them of the land release, when the tender process opens and closes, and whether the area was awarded or not.

For the latest information
[Download the The Gas Guide](#)
 (see Chapter 3: Exploration Phase).



Between 2016 and July 2021, there have been 11 tender releases. Of the 7.01 million ha released, around 30% were awarded.

Figure 30. The Land Release Process

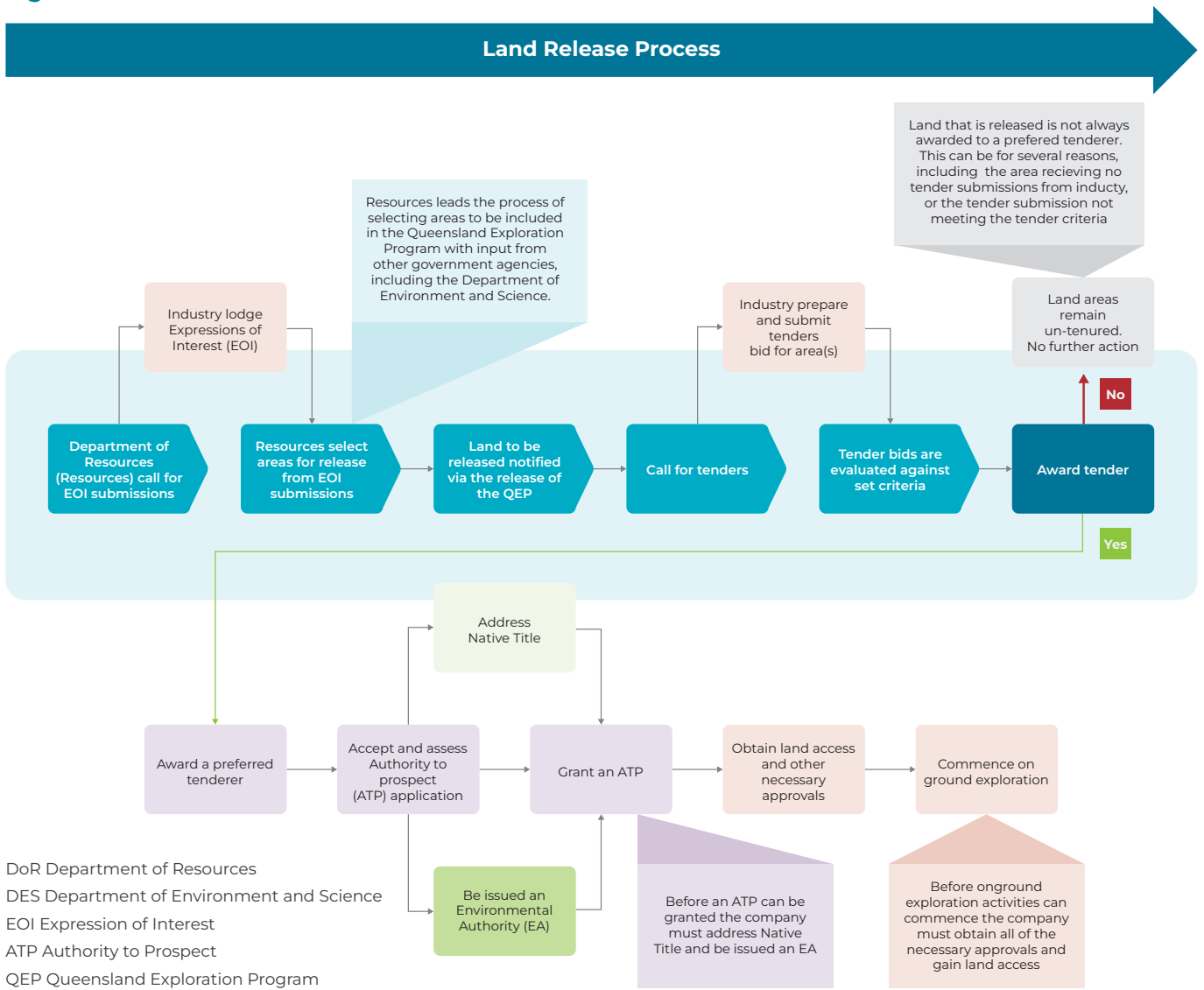


Table 18. Breakdown of tender releases by release period

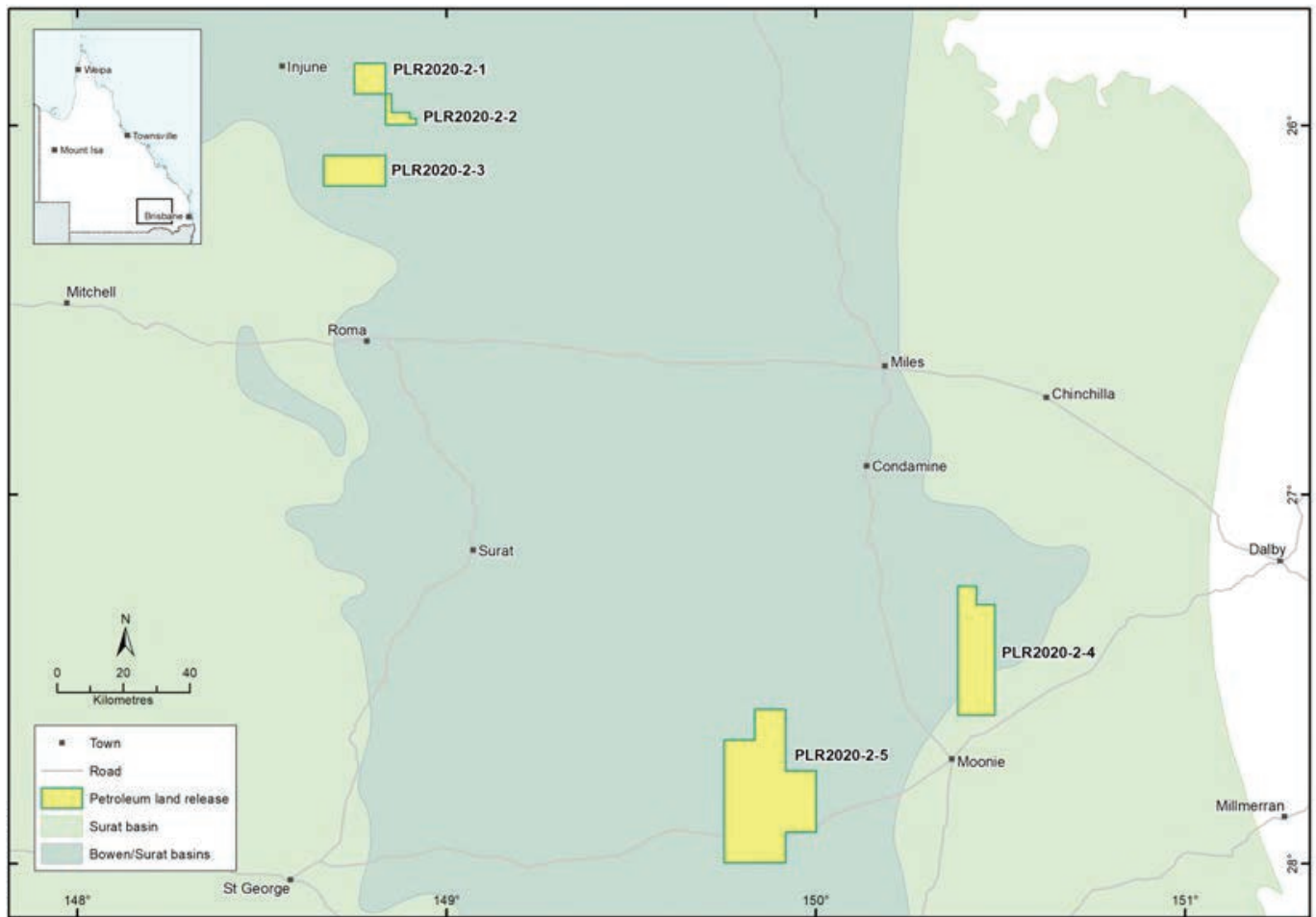
Tender Opened	Tenders Offered	Tenders Awarded	
	ha	ha	% Tenders offered that were awarded
Jun-20	145,900	11,400	8%
May-20	674,600	302,100	45%
Nov-19	3,317,700	223,500	7%
May-19	374,200	345,000	92%
Nov-18	663,600	279,300	42%
Nov-18	1,800	1,800	100%
Mar-18	1,743,100	750,200	43%
Sep-17	39,500	39,500	100%
Apr-17	8,600	8,600	100%
Feb-17	5,800	5,800	100%
Nov-16	36,500	36,500	100%
Total	7,011,300	2,003,700	29%

Source: Department of Resources

In June 2020 Queensland Government released a call for tenders for Authorities to Prospect (PLR2020-2) which included five tender areas across the Bowen and Surat basins totalling 1459 km². This land release was in addition to the land identified in the 2020 Queensland Exploration Program released under PLR2020-1. Out of the five areas released in PLR2020-2, two of the areas have been awarded to preferred tenderers.



Figure 31. Petroleum and gas exploration tender areas – PLR2020-2 tender release.



Source: Department of Resources

Following the QEP 2020 releases, the government released five additional areas for competitive tender in June 2020, covering approximately 1,500 km², with two areas near Moonie, and three near to Injune in the Bowen and Surat basins. The tender process closed in September 2020.

The five areas were previously released for tender under the 2018 QEP but were not awarded.

The areas were re-released in response to industry feedback and as part of the Queensland Government's Unite and Recover for Queensland Jobs plan.

In February 2021, AusGasCo CSG Pty Ltd was appointed preferred tenderer for two blocks (tender area PLR-2020-2-1 and PLR2020-2-2), located to the south-east of Injune, totalling 114 km². Of the three remaining areas, two will not be awarded and one area is still under evaluation at time of writing.

Table 19. Preferred tenderers under the Call for Tenders for Authorities to Prospect (PLR2020-2)

Item	Tender area code	Size and location	Commodity	Tender outcome
1	PLR2020-2-1	77 km ² (25 sub-blocks) 17 km south-east of Injune	Coal seam gas	Awarded
2	PLR2020-2-2	37 km ² (12 sub-blocks) 29 km south-east of Injune	Conventional and/or unconventional gas	Awarded
3	PLR2020-2-3	154 km ² (50 sub-blocks) 32 km south-east of Injune	Coal seam gas	Not awarded
4	PLR2020-2-4	357 km ² (117 sub-blocks) 25 km south-west of Moonie	Conventional and unconventional oil and gas	Not awarded

Source: Department of Resources

AUSTRALIAN MARKET SUPPLY CONDITION – DOMESTIC GAS

Under the [Petroleum and Gas \(Production and Safety\) Act 2004](#), the [Australian Market Supply Condition](#) is a condition imposed on certain petroleum and gas tenures in Queensland, that requires the holder of the tenure to supply any produced gas to the Australian market.

Not long after the LNG facilities on Curtis Island commenced full production, industrial consumers of gas in the east coast gas market raised concerns that they were unable to secure contracted gas at commercially viable terms and price. In response to these concerns, in February 2017, the Queensland Government released its first tender of petroleum land that had the Australian Market Supply Condition attached.

The release of the 58 km² area in the Surat Fairway was considered a ‘pilot’ to test the policy objectives. The preferred tenderer was awarded the area in September 2017 and gas has since been produced and is currently being supplied to manufacturing and industrial consumers to produce everyday products such as house bricks, glass bottles and cardboard packaging.

Since this initial award, a further 9,147 km² of land has been awarded with the Australian Market Supply Condition attached – this equates to approximately 46% of all petroleum exploration land awarded since 2017.

In 2020, the Queensland Government conducted a [Review of the Australian Market Supply Condition](#) to test the condition’s effectiveness and to determine if the policy objectives were being met. Overall, the review found that the Australian Market Supply Condition has not hindered investment in the gas industry while gas prices for the Australian market and LNG net back are similar, and it is generally accepted by the gas industry and industrial gas users.

07 CONCLUSION

The gas industry in Queensland is not new, with commercial operations being developed since the 1960s in the Cooper Basin and Moonie oil fields, followed by the emergence of the CSG to LNG sector in Queensland, approximately 10 to 15 years ago.

The early years of CSG development were marked by tensions and friction between landholders, the community and the gas sector. Whilst some concerns remain today, as the gas industry has developed and matured over time, with a working coexistence practice has become embedded in regional communities that host gas activities.

A practice of coexistence is built, developed and sustained over time by the collaboration and trust between all the stakeholders. The coexistence model in Queensland has been built on these foundations. However, it is a model that remains fragile and requires ongoing enhancement and management to be sustained. All stakeholders need to continue to invest in their coexistence relationships, including the resources industry, landholders and host communities.

Coexistence is not a 'set and forget' concept, rather it is a practice that requires constant attention. While many of the concerns of the past have been addressed, some concerns remain. Engagement, communication and education are important tools to foster coexistence, however relationships built on trust and transparency are critical attributes to realising a sustainable coexistence in host communities.

Despite the maturing and acceptance of the gas industry, there is a deficit in peoples' understanding of the industry. Huge amounts of data are generated by the gas industry, government and other organisations. This data and information holds significant value to the broader community and improves their understanding of the gas sector and an understanding of, and confidence in, the regulatory framework.

Data is collected and held by governments and industry, however very little is made publicly available or easily accessible to the broader community leading to an information imbalance. This imbalance between the gas industry and individual landholders can hinder community confidence. The purpose of this report is in part to address the information imbalance.

Easy access to information can enhance the community acceptance of the gas industry by communicating gas company activities, compliance objectives and provide evidence of whether objectives are being met. Information provision can contribute to allaying fears and developing acceptance.

There is an ongoing demand for Queensland gas and the industry is forecast to expand into areas previously not exposed to gas development. The acceptance of the gas industry in host communities is vital to the success of the gas industry and enabling the realisation of the benefits and contributions of the gas industry to regional communities.

In areas where the gas industry already operates, the coexistence model can be enhanced further. There is growing evidence that the coexistence of communities and the petroleum sector is maturing to partnership rather than a relationship where one party benefits to the detriment of the other. The development and maturing of partnerships between all of the stakeholders can only be seen as a benefit.

The Commission operates as part of a bigger ecosystem of state government regulators, local governments, judicial and other dispute resolution bodies, gas companies, peak industry representative bodies and advocacy groups all undertaking community engagement. The Commission has and continues to play an important role in improving sustainable coexistence and continues to support Queensland gas and agricultural sectors.



GLOSSARY

The gas industry and the mechanisms covering its operation in Queensland have spawned a range of terms and acronyms. This is a quick guide for the more commonly used terms and acronyms found throughout this document.

Access agreement – A negotiated agreement between a resource company and private landholder relating to the rights over designated ‘access land’.

Aquifer – An underground geological layer with high permeability which means it can store and allow water movement.

Associated water – Sometimes referred to as ‘CSG produced water’. Groundwater that is produced because of gas production. This water can be treated and used beneficially for a range of purposes.

ATP – Authority to prospect also commonly known as an exploration permit or tenure. To explore for petroleum, oil, coal seam gas and natural gas in Queensland, you must hold a current authority to prospect.

Australian Energy Market Operator (AEMO) – A not-for-profit organisation, registered as a public company limited by guarantee; whose operating costs are recovered through fees paid by market participants. Their role is to manage the electricity and gas systems and markets across Australia, helping to ensure Australians have access to affordable, secure, and reliable energy.

Australian Competition and Consumer Commission (ACCC) – An independent Commonwealth statutory authority whose role is to enforce the Competition and Consumer

Act 2010 and a range of additional legislation, promoting competition, fair trading and regulating national infrastructure for the benefit of all Australians.

Coal seam gas (CSG) – Natural gas contained in coal seams.

Conduct and Compensation Agreement (CCA) – A legal agreement between a landholder and a resource company relating to proposed activities or conduct and, where there is impact on the landholder, compensation arrangements for those activities.

Construction phase – Can include the building and/or upgrading of vehicle access tracks, well pad development, drilling, well completion and the installation of above ground infrastructure and pipelines. As a general rule, it can take 5–7 months from the start of a well pad to operational handover.

Conventional gas – also see natural gas. Conventional gas reservoirs largely consist of porous sandstone formations capped by impermeable rock, with the gas stored at high pressure.

CSIRO – The Commonwealth Scientific and Industrial Research Organisation is Australia’s national science research agency.

DAF – The Department of Agriculture and Fisheries works to achieve a productive and profitable agriculture, fisheries, and forestry sector in Queensland by promoting sustainability and innovation.

DES – The Department of Environment and Science are responsible for protecting and managing parks, forests, and the Great Barrier Reef. They lead the development of science strategy for government whilst fostering a community of the arts and facilitating the growth of the arts and cultural sector in Queensland. They are also responsible for administering Chapter 3 of the Water Act 2000.

DoR – The Department of Resources are responsible for regulating the exploration and mining of mineral and land resources in Queensland.

EA – In Queensland, you need to apply for an Environmental Authority to undertake an environmentally relevant activity (ERA).

Fracking or fraccing – See Hydraulic Fracturing.

GFCQ/The Commission – Established as an independent statutory body in 2013, the GasFields Commission Queensland's purpose is to manage and improve the sustainable coexistence of landholders, regional communities, and the onshore gas industry in Queensland.

GISERA – CSIRO's Gas Industry Social & Environmental Research Alliance is a collaboration between CSIRO, Commonwealth and State Governments and industry established to undertake publicly reported independent research.

GWh – A gigawatt hour is a unit of energy representing one billion (1,000,000,000) watt hours and is equivalent to one million kilowatt hours.

Hydraulic Fracturing (Fraccing) – A safe and established method used by the petroleum and gas industry since the late 1940s to increase the rate and total amount of petroleum and gas extracted from reservoirs. Water, sand (99%) and household chemicals (1%) are pressure pumped into steel encased wells to stimulate the opening of cracks in gas-bearing formations.

Hydrocarbons – Are organic compounds comprising hydrogen and carbon. Hydrocarbons are the principal constituents of oil and gas.

IAA – An immediately affected area (a subset of an LAA) is predicted to exceed the bore trigger thresholds within the next three years.

Infilling – The addition of wells in a field that decreases average well spacing. This practice both accelerates expected recovery and increases estimated ultimate recovery in heterogeneous reservoirs by improving the continuity between injectors and producers. As well spacing is decreased, the shifting well patterns alter the formation-fluid flow paths and increase sweep to areas where greater hydrocarbon saturations exist.

LAA – A UWIR identifies bores in a long-term affected area that are predicted at any time in the future to exceed the bore trigger threshold.

Landholder – Owner/occupier/lessee (e.g. rental tenant) of private land.

LGA – Local government area is used by The Australian Bureau of Statistics to collectively refer to all local government administrative zones regardless of the varying designations. There are 77 LGAs in Queensland which are classified as Cities, Regions or Shires.

LNG – Liquefied natural gas. Natural gas that is cooled to -161 degrees Celsius to reduce its volume to 1/600th for the purpose of transport. To unload LNG from a vessel no processing is required as conversion back to gaseous form occurs as the temperature increases.

MGA – A Make Good Agreement is a legally binding agreement entered into by a resource tenure holder and a bore owner about a water bore. An MGA is required for all bores that have had a bore assessment undertaken (not just those with an impaired capacity).

Natural gas – Primarily methane extracted from gas-bearing underground reservoirs.

OGIA – The Office of Groundwater Impact Assessment is an independent entity established under the Water Act 2000 responsible for assessing and managing the impacts of groundwater extraction from resource operations in CMAs (OGIA also provides advice on related matters outside CMAs).

Petajoule – One petajoule (PJ) is enough energy to power 42,000 average Australian households for one year.

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Petroleum – Liquid, gaseous and solid hydrocarbons including oil, gas, condensate, ethane, propane, butane, and pentane.

Petroleum well – For the purposes of this report, 'petroleum wells' refers to conventional, tight gas and shale wells.

PL – A petroleum lease gives its holder the right to explore, test for production and produce petroleum within the defined area of the lease.

PPL – To construct a petroleum pipeline outside the area of your petroleum lease, you need a petroleum pipeline licence.

Private land – Freehold land or an interest in land less than fee simple held from the State under another Act. However, land is not private land to the extent of an interest in a resource authority under a resource Act.

QEP – The Queensland Exploration Program provides a yearly schedule for exploration opportunities for petroleum and gas and coal. The program outlines the tender process and provides details on the location of each exploration tender area and the timing of each competitive tender process.

Resource Act – The Petroleum and Gas (Production and Safety) Act 2004, Petroleum Act 1923, Mineral and Energy Resources (Common Provisions) Act 2014.

Resource authority – An authorisation (permit/licence) from the Queensland Government for a resource company to carry out specified activities over an area of land, including privately owned land.

Resource company – A resource authority holder or their agents or representatives.

Shale gas – Natural gas that is contained within shale formations under high pressure. Having extremely low porosity makes it difficult for gas to flow to wells. Hydraulic fracturing is commonly used in shale gas wells to increase the flow of gas from the reservoir.

Surat Cumulative Management Area (Surat CMA) – Under the Water Act 2000, a cumulative management area (CMA) can be declared if an area contains two or more resource tenures, including tenures on which coal seam gas (CSG) and mining activities operate, and where there may be cumulative impacts on groundwater resulting from water extraction by the tenure holders. The Surat CMA was declared in 2011 after consideration of the location of petroleum and gas operations, the geology of the area, the potential for interconnectivity between aquifers in the area and the cumulative impacts of water extraction by petroleum tenure holders.

Tight gas – A natural gas field that can be made economic with horizontal wells and/or fracture stimulation (see hydraulic fracturing).

Unconventional gas – Also see CSG, shale and tight gas. Unconventional gas is found in complex geological systems, with some trapped in reservoirs with poor permeability or porosity. The gas is often difficult to produce and techniques for production vary and may require innovative technological solutions for extraction.

UWIR – An underground water impact report for the Surat Cumulative Management Area assesses the groundwater impacts from resource operations in the Surat and southern Bowen basins. It also establishes strategies to manage the predicted impacts and responsibilities for implementing various aspects of the strategies.

Well Footprint – A standard single well site for conventional oil or gas will typically affect a surface area measuring 100 m x 100 m.

