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22 Economics

22.1 Introduction

This section addresses the economic impacts associated with the GFD Project to the local, State and national economies. The GFD Project area is located across four local government areas: the Banana Shire and Central Highlands, Maranoa and Western Downs regional councils. These economies are highly reliant on resource production (mining and oil/gas) and agriculture. These primary industries are supported by a range of services, concentrated in the urban centres of Roma and Blackwater. The GFD Project area's economy is dependent on effective transport networks to connect the area to domestic and international markets.

The section has been prepared in accordance with section 6 of the *Terms of reference for an environmental impact statement*, issued March 2013. The index to locate where each ToR requirement is met is included at Appendix B: Terms of reference cross-reference.

22.2 Regulatory context

This EIS has been prepared in accordance with the State and Commonwealth regulatory context described in Appendix C: Regulatory framework. At the time of publication, there were no regulatory requirements that provide directives for economic impact assessments. Economic impact assessments are undertaken as part of the EIS process to enable a balanced assessment of a project's environmental, social and economic impacts.

22.3 Assessment methodology

Economic modelling has been undertaken for the period 2013 to 2040 for three specific economic regions:

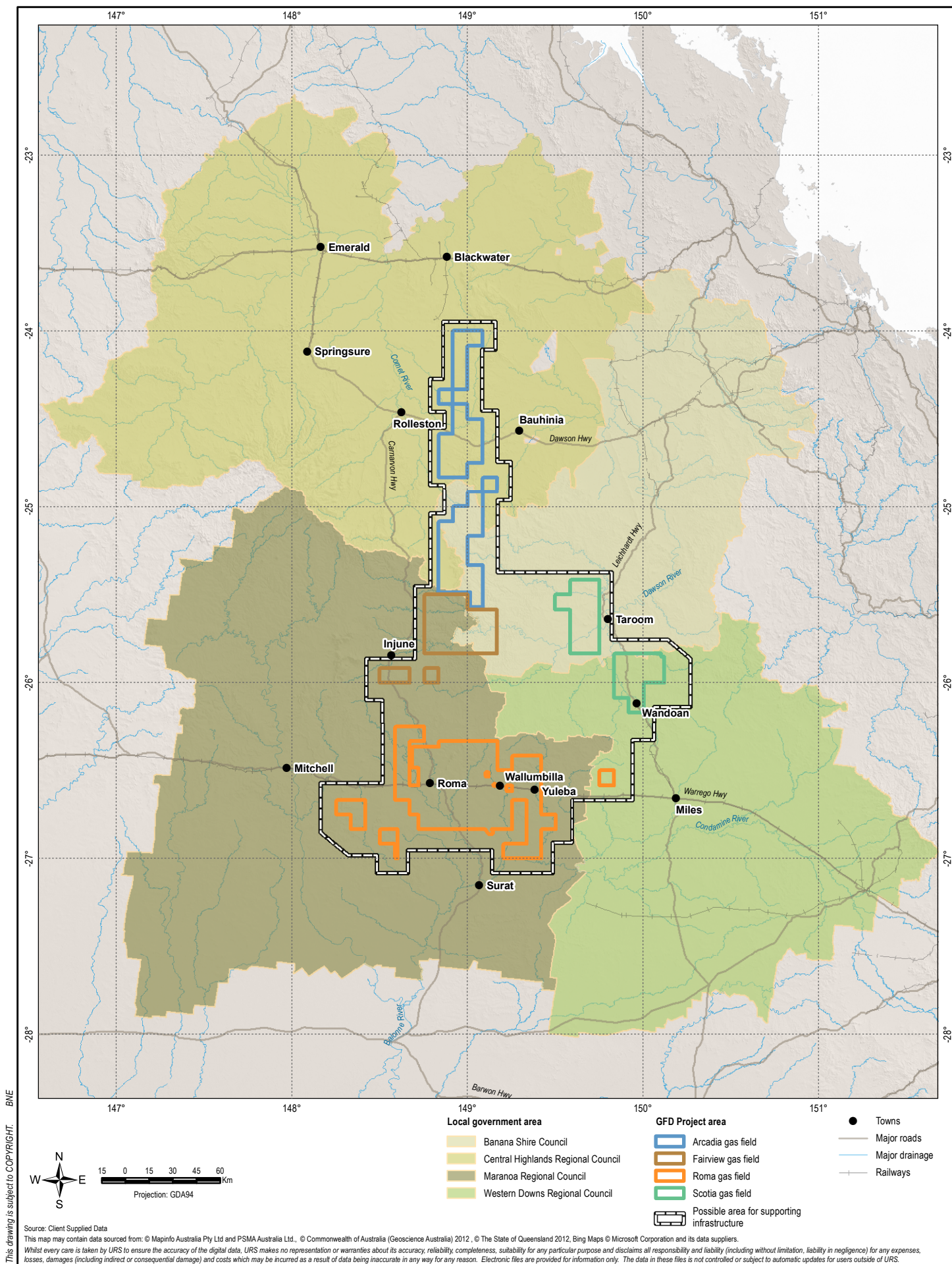
- GFD Project area — for the economic assessment the GFD Project area has been assumed to include all of the Banana Shire Council and Central Highlands, Maranoa and Western Down regional council areas
- Queensland — includes the GFD Project area in the context of the rest of the State
- Australia — examines the impact of the GFD Project from a national perspective.

The GFD Project gas fields and relevant local government areas are illustrated in Figure 22-1.

Although the GFD Project construction commences in 2016, the analytical period has been bought forward to 2013 in order to include preparation activity and other smaller approved capital works that are already taking place. Modelling results start at 2010 to allow for the presentation of five year snapshots.

As the GFD Project follows an incremental field development process, the exact number, size and location of production wells, gas compression facilities and associated infrastructure (and how these are integrated within existing GLNG Project infrastructure) is yet to be determined. To reflect some of these unknowns, the economic impact modelling undertaken specifically for this EIS has been conducted for two different production scenarios:

- **Moderate scenario** taking into account commercial sensitivities related to gas development that results in a lower well count and number of support facilities
- **Maximum scenario** based upon the development of the full 6,100 wells for which approval is being sought.



To gauge the economic impacts of varying levels of gas production, each scenario is compared against a baseline or reference case. The reference case describes how the economy would have evolved over time in the absence of the GFD Project. Other planned and approved developments in proximity to the GFD Project area (and across Australia) have been considered to form part of the baseline.

The economic model used is the Deloitte Access Economics Regional General Equilibrium Model (DAE-RGEM). It models macroeconomic factors such as gross domestic product (GDP), employment and wages. It is a large-scale, multi-region, multi-commodity computable general equilibrium model of the world economy.

One of the realities of economic modelling — especially over an extended analytical horizon — is that projections can contain an element of uncertainty. It is difficult to forecast economic growth, advances in technology, external political dimensions and other dynamic factors that impact future economic outcomes. The modelling results are underpinned by a number of assumptions and have been guided by available data and the prevailing economic conditions at the time of writing. Further discussion on the DAE-RGEM and the assumptions used in its development are provided at www.deloitteaccess economics.com.au.

22.4 Economic values

This section provides an overview of the current economic environment of the GFD Project area. The local economies across the area are generally considered to be robust and feature low levels of unemployment and high participation rates. The GFD Project area's long association with agricultural and forestry production has been augmented in recent decades by resources extraction, strengthening regional productivity and driving demand for housing and construction, retail trade, and services, especially in the north of the GFD Project area (Department of State Development, Infrastructure and Planning, 2013).

Government aspirations, objectives, strategies and policies for the economic growth of the region are expressed in the Central Queensland and Darling Downs regional plans. These plans specifically provide direction to resolve competing State interests relating to the agricultural and resources sectors and to enable the growth potential of the region's towns. Further details on these plans are provided in section 8.4.5 of Section 8: Land use and tenure.

In the context of this discussion, data presented as being applicable to the GFD Project area are data from the whole of the four relevant local government areas (Banana Shire and Central Highlands, Maranoa and Western Downs regional councils). This is because the available economic data were not able to be aggregated into smaller areas.

22.4.1 Population and demographics

The Australian Bureau of Statistics (ABS) estimated the total 2011 population of the four local government areas in the GFD Project area to be 96,000, with the Central Highlands Regional Council area having the largest population of 33,500.

With the exception of the Central Highlands Regional Council area, population ageing in the GFD Project area is occurring at a higher rate to the rest of Queensland and Australia (ABS, 2013).

22.4.2 Employment and workforce

The best available employment and industrial structure data from the ABS is reported at a broader industry level, the most relevant for this EIS being the category of 'mining industry'. This category includes oil and gas extraction as well as coal mining, metal mining and mineral mining subsectors. Although there are 11 coal mines in the Central Highlands Regional Council area, oil and gas activity generally dominates employment statistics in the GFD Project area. As such, the term mining industry as used by the ABS can be interpreted to primarily refer to the oil and gas industry unless stated otherwise.

The industry employs around 11,135 full-time equivalent (FTE) workers and on average accounts for 22.8% of employment in the GFD Project area. While these figures represent a sizable share of the workforce, the employment footprint of the industry is much smaller than its contribution to value added (i.e. the difference between the value of goods and services purchased and the value of gas sold from the GFD Project) which is estimated to be 55% on average. This reflects the high capital intensity of oil and gas extraction and is a pattern seen in other capital intensive sectors such as energy generation and transport.

The top six industries by employment across Banana Shire Council and Central Highlands, Maranoa and Western Downs regional councils are shown in Table 22-1.

Table 22-1 Top six industries by employment, 2011

Industry	Employment (% share)					
	Banana	Central Highlands	Maranoa	Western Downs	GFD Project area	Queensland
Mining (incl. resources)	25.4	37.8	9.6	8.5	22.8	3.3
Agriculture, forestry and fishing	19.3	9.7	21.5	21.2	16.5	3.3
Construction	5.8	10.2	9.1	11.8	9.7	10.7
Retail trade	5.5	5.1	8.0	9.0	6.7	9.2
Health care, social support	5.0	3.0	9.1	6.5	5.3	10.9
Manufacturing	7.9	3.2	5.3	6.3	5.2	9.7
Other industries	31.1	31.0	37.5	36.7	33.6	52.9

Source: Deloitte Access Economics, 2013

The labour markets across the four local government areas have recently been typified by high participation rates and low unemployment rates, as shown in Table 22-2. These labour market characteristics present workforce constraints for new resource projects, often requiring a substantial share of the workforce to be drawn from outside the GFD Project area.

Table 22-2 Workforce summary

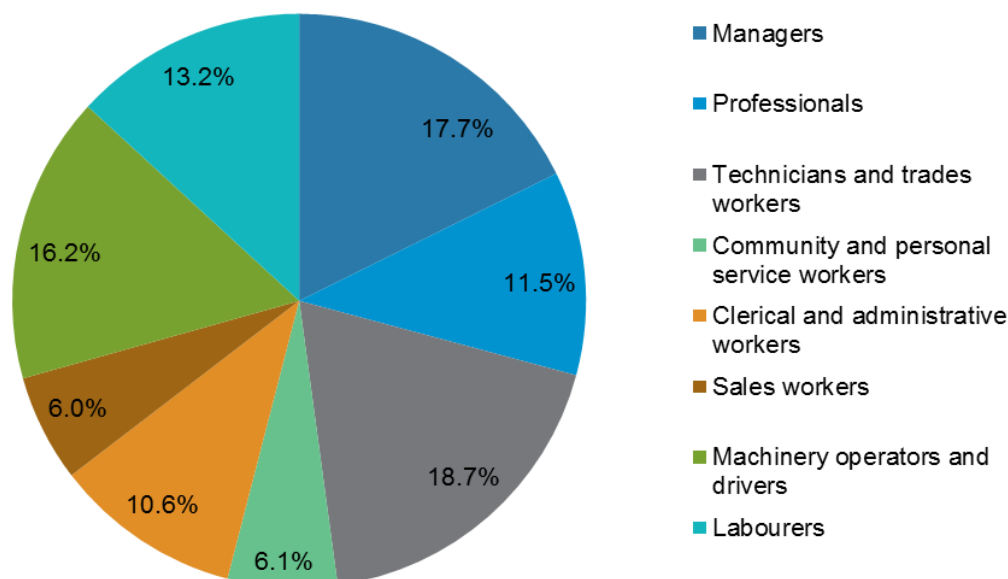
Workforce characteristics	Banana	Central Highlands	Maranoa	Western Downs	GFD Project area	Queensland
Employment (FTE)	8,555	18,672	6,980	14,629	48,837	1,884,393
Unemployment rate (%)	2.5	2.1	2.3	3.3	2.6	6.1
Participation rate (%)	69.9	69.8	67.5	63.1	67.2	66.8
Median weekly income (\$)	1,392	1,998	1,209	1,067	1,500	1,235

Source: ABS, 2013 and Deloitte Access Economics, 2013

22.4.3 Qualifications and skills

The most common workforce qualifications in the GFD Project area are reflective of the region's focus on mining and agriculture. The GFD Project area's economic trends are also evident in its occupational breakdown, with 48% of the workforce employed as technicians and trades workers, machinery operators and drivers, as shown in Figure 22-2.

Figure 22-2 GFD Project area occupation summary, 2011



Source: ABS, 2013

22.4.4 Industrial structure and size

The resources and agriculture sectors across the four local government areas account for between 27% and 70% of gross value added within the region. The Central Highlands Regional Council area is the most mining intensive with around 70% of economic output generated by predominantly coal-related activities.

The predominant agricultural production in the region involves grain, sheep and beef cattle farming. The area of land that is used for agricultural purposes is detailed in section 8.4.5.1 of Section 8: Land use and tenure. Maranoa Regional Council is well known for its beef industry; the Roma Saleyards facility is the largest cattle selling centre in Australia. There is a strong presence of sectors that support primary industries, including manufacturing, power generation, construction and wholesale trade.

The top six industries by value added within the four regions are outlined in Table 22-3 below.

Table 22-3 Top six industries by value added, 2011

Industry	Value added (% share)					
	Banana	Central Highlands	Maranoa	Western Downs	GFD Project area	Queensland
Mining (incl. resources)	59.2	69.9	27.7	26.7	54.8	12.4
Agriculture, forestry and fishing	9.9	5.0	17.7	17.1	9.6	3.0
Construction	3.5	5.8	8.3	11.2	6.7	10.0
Electricity, gas, water and waste services	5.2	0.7	4.0	6.8	3.1	2.8
Wholesale trade	2.6	2.7	3.0	3.5	2.9	6.4
Manufacturing	4.4	1.6	3.3	4.4	2.8	8.3
Other industries	15.3	14.4	35.9	30.2	20.0	57.0
Total value added (\$M)	1,834	5,035	978	2,039	9,886	235,655
GRP (\$M)	2,207	6,059	1,177	2,454	11,897	283,604

Source: Deloitte Access Economics, 2013

22.5 Potential impacts

The economic impacts from resource projects are typically driven by two distinct phases of development: construction and operations. During the construction phase, proponents rely more heavily on suppliers and contractors due to the requirements of installing large-scale capital works. Resource support companies in the construction, manufacturing and professional services industries typically benefit from greater demand for their goods and services.

Following commissioning, smaller localised works are undertaken. This by no means implies that economic activity subsides; rather the supply side industries shift according to production, processing and distribution requirements. During decommissioning, similar activities to the construction phase will be undertaken, although at a smaller scale.

As the GFD Project is expected to be developed incrementally, with appraisal and construction occurring concurrent with production, the construction and operations phases are less clearly demarcated — creating sustained demand for a range of different types of supplying industries. The location from which these goods and services are procured has significant implications for the dispersion of economic benefits over the life of the GFD Project. Where goods and services can be obtained locally, the gains in the regional economy in the GFD Project area are highest.

Industry averages for supplier payments and the level of local content have been used to estimate the construction and operations expenditures of the GFD Project across the three modelling geographies (i.e. the GFD Project area, Queensland and Australia).

Approximately 85% of the goods and services (including contractors) required for the GFD Project will be purchased domestically, with remaining inputs (mostly specialised large-scale modular units such as compressors) sourced from international providers.

In terms of locally procured inputs for the GFD Project, around half the intermediary inputs (i.e. goods and services purchased from suppliers and used in the process of GFD Project development and gas production) are expected to be sourced from within the GFD Project area with the other half procured from Queensland and the rest of Australia.

Based on these construction and operations expenditure assumptions, the modelling predicts the anticipated wider economic impacts of the GFD Project. This encompasses two economic impacts:

- Direct impacts: The economic gains associated with 'core' commercial operations, namely gas production and revenues
- Indirect impacts: The economic gains in related industries where the benefits associated with increased resource activity are typically the highest (i.e. construction, manufacturing, transport, etc.).

Due to the presence of both direct and in-direct impacts in the economic projections, the results presented in this section may not necessarily be comparable to estimates for output and employment in other parts of the EIS. These sections typically limit their analysis to direct impacts, which do not capture the wider indirect economic gains from the GFD Project.

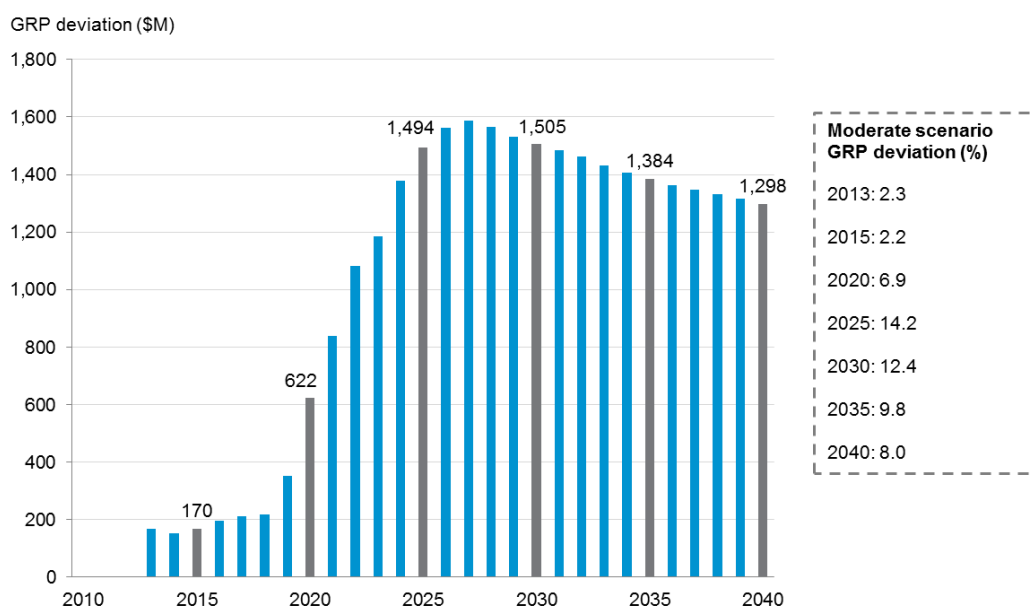
22.5.1 GFD Project area

The GFD Project is projected to have a significant economic impact on local communities, encompassing the local government areas of Banana, Central Highlands, Maranoa and the Western Downs regional councils.

Gross regional product

The additional economic output generated in the GFD Project area in real 2013 terms for the moderate development scenario is shown in Figure 22-3, with the maximum development scenario shown in Figure 22-4. The economic impacts in the moderate scenario are highest around 2025–2030. Specifically, in 2025 the gross regional product (GRP) is 14.2% above the baseline, the equivalent of an additional \$1.5 billion in output to the GFD Project area. In the maximum scenario, the economic impacts are more pronounced with GRP increasing between 18.0% and 20.6% above the baseline, equating to a total of \$2.9 billion by 2040.

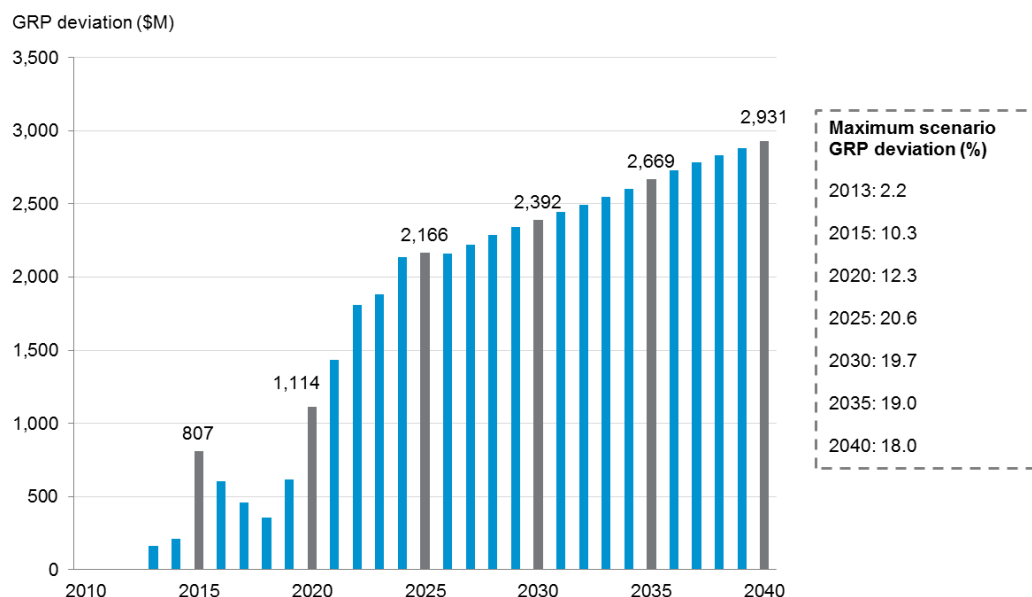
Figure 22-3 GFD Project area impacts, moderate scenario



Source: Deloitte Access Economics, 2013

Note: GRP deviation refers to the amount of value add that is generated in the GFD Project area, above and beyond a scenario where the GFD Project is not developed. Values are in real 2012-13 terms.

Figure 22-4 GFD Project area impacts, maximum scenario



Source: Deloitte Access Economics, 2013

Note: GRP deviation refers to the amount of value add that is generated in the GFD Project area, above and beyond a scenario where the GFD Project is not developed. Values are in real 2012-13 terms.

To further understand the economic impact of the GFD Project, the net present value (NPV) was calculated. NPV measurements quantify the current value of a future stream of economic contributions that occur over time. Between 2013 and 2040, the GFD Project is expected to contribute between approximately \$9.8 and \$16.9 billion to the GFD Project area GRP in NPV terms under the moderate and maximum scenarios respectively (see Table 22-4).

Table 22-4 Economic impacts within the GFD Project area

Economic indicator	Scenario	2013–2025	2026–2040	2013–2040
GRP deviation (NPV, \$M)	Moderate scenario	4,257	5,538	9,795
	Maximum scenario	7,487	9,395	16,882

Source: Deloitte Access Economics, 2013

Note: GRP deviation refers to the amount of value add that is generated in the GFD Project area, above and beyond a scenario where the GFD Project is not developed. NPVs have been calculated using a discount rate of 7%. Values are in real 2012-13 terms.

Employment and wages

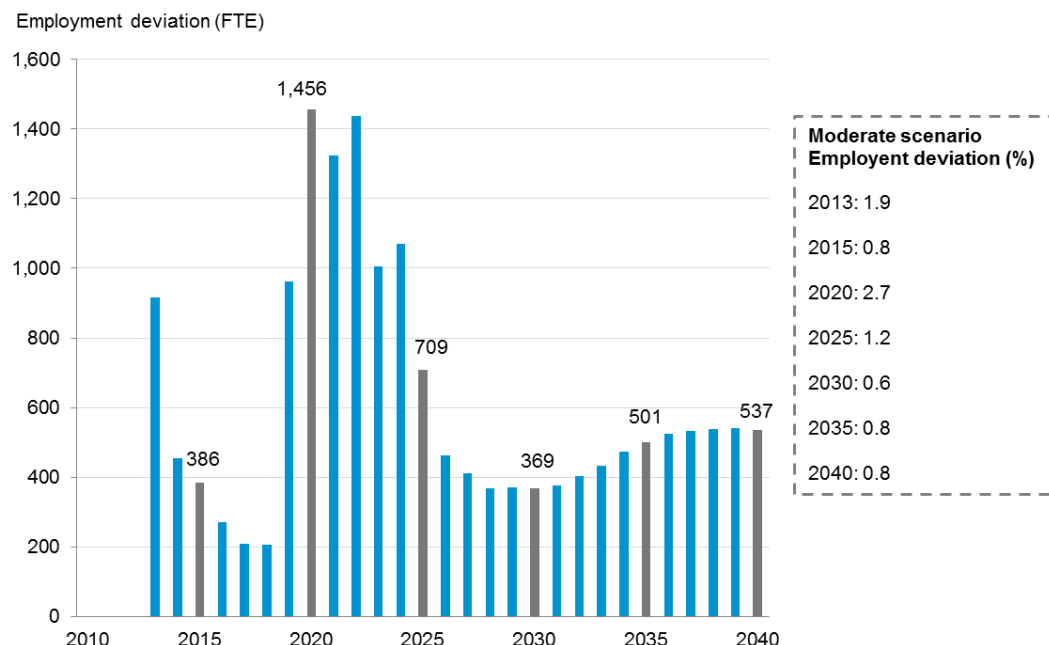
The regional employment impacts associated with the GFD Project are appreciable. In a region where the labour force consists of just over 48,800 people and with low rates of unemployment, these labour requirements are significant. While the exact dynamics of the regional labour market at the time of GFD Project cannot be predicted, it is reasonable to imagine that the reliance on temporary workers from other parts of Queensland and Australia may increase for the GFD Project.

In the moderate scenario, the GFD Project is estimated to contribute to the creation of an additional 1,456 FTE jobs by 2020 — an increase of 6.2% above the reference case (detailed in Figure 22-5). Once the GFD Project becomes operational, the employment requirement subsides and results in an employment deviation of around 537 FTE workers by 2040. As shown in Figure 22-6, much of the workforce is expected to be employed in Maranoa local government area. Increase in employment demand can also increase wages. Alongside the growth in employment generated by the GFD Project, the model shows an increase in real wages in the region, which peak at around 6.9% in 2020 in the construction phase under the moderate scenario, but around 2% in the long-term operational phase.

GLNG is a Santos PETRONAS Total KOGAS venture.

Though higher wages for those involved in resource development is a positive outcome for their household wealth and consumption, wages in other sectors also tend to increase. This can place pressure on regional businesses where there are not offsetting gains in revenue. However, these impacts are expected to be short term and minor.

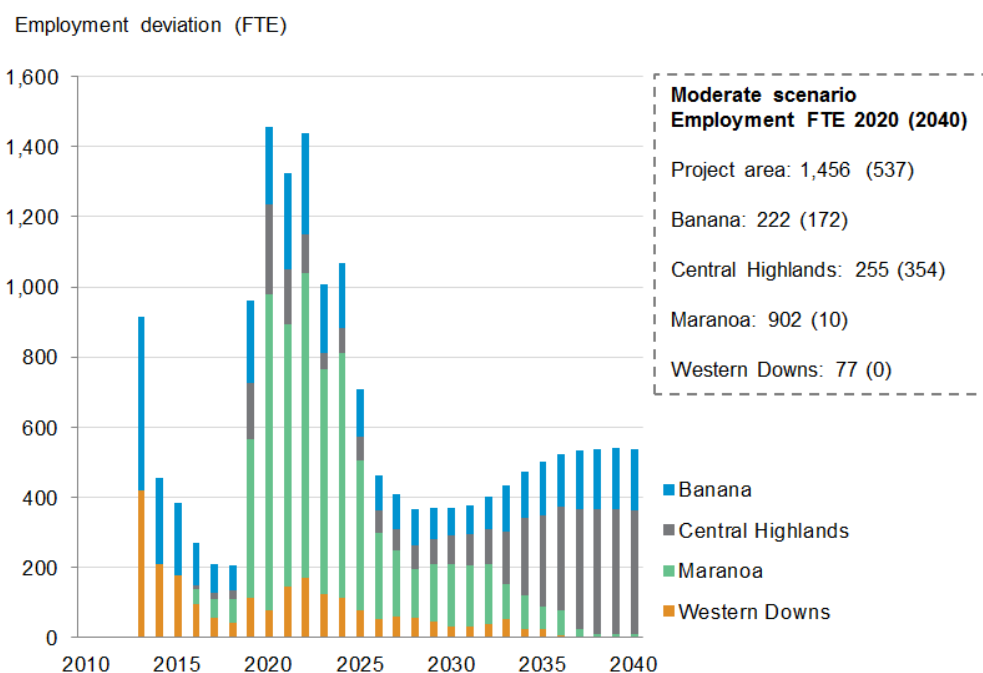
Figure 22-5 Employment impacts in the GFD Project area, moderate scenario



Source: Deloitte Access Economics, 2013

Note: Employment deviation refers to the number of full-time equivalent workers that are employed in the GFD Project area, above and beyond a scenario where the GFD Project is not developed.

Figure 22-6 Employment distribution within the GFD Project area, moderate scenario

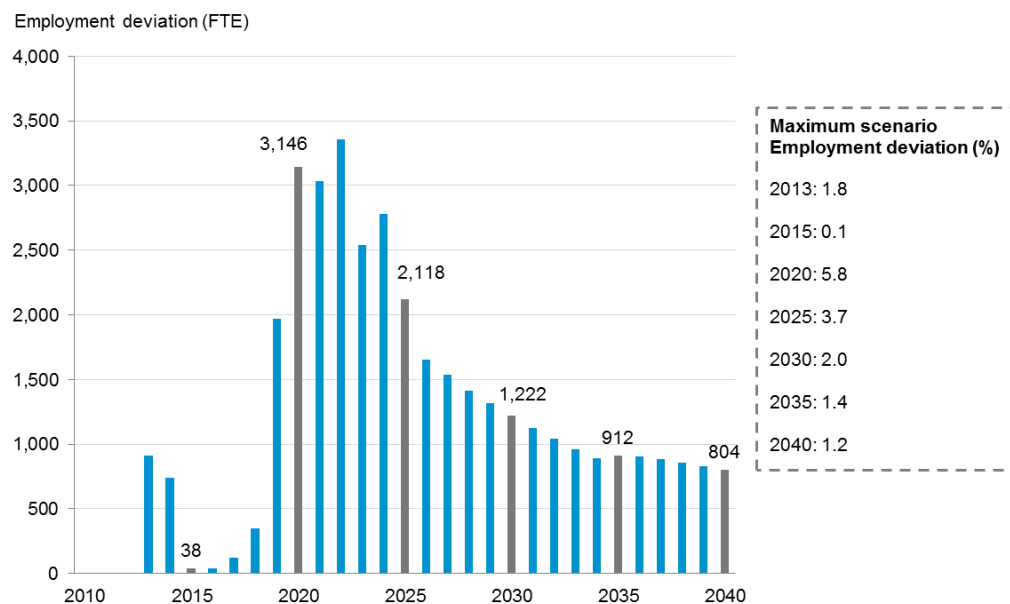


Source: Deloitte Access Economics, 2013

Note: Employment deviation refers to the number of full-time equivalent workers that are employed in the GFD Project local government areas, above and beyond a scenario where the GFD Project is not developed.

The maximum scenario employment impacts and distribution between local government areas are shown in Figure 22-7 and Figure 22-8 respectively. In this scenario, it is estimated that an additional 3,146 FTE jobs will be created by 2020. This includes direct employment by Santos GLNG and jobs created in related industries. Of this, 479 FTE jobs are generated in Banana, 551 FTE jobs in Central Highlands with around 1,950 FTE and 166 FTE jobs created in the Maranoa and Western Down local government areas. Along with higher employment, wage impacts in the GFD Project area are higher in the maximum scenario, reaching a maximum at around 15% in 2020 during construction. As the local labour market adjusts wage pressures are expected to ease after 2030 to around 3% by 2040.

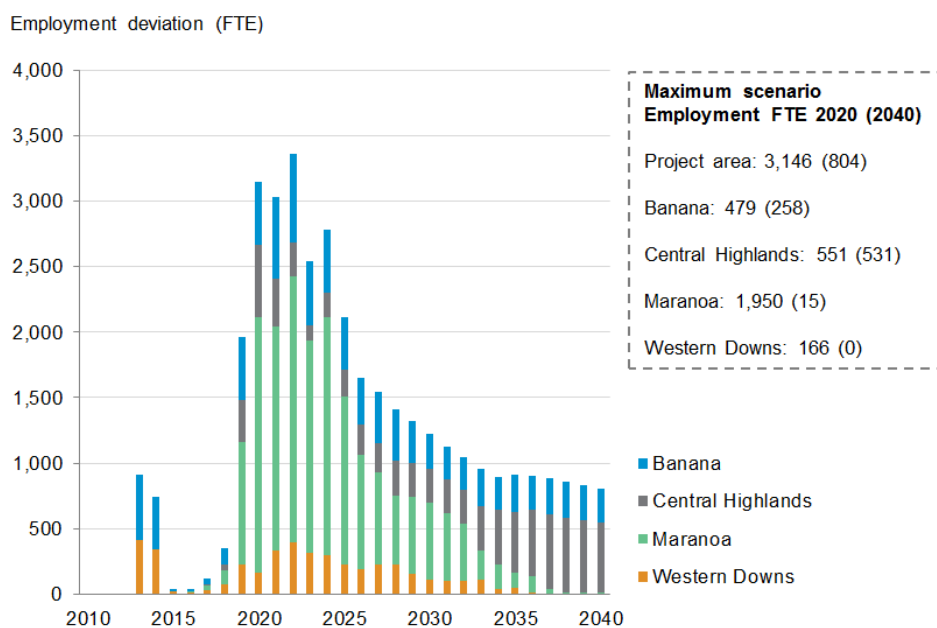
Figure 22-7 Employment impacts in the GFD Project area, maximum scenario



Source: Deloitte Access Economics, 2013

Note: Employment deviation refers to the number of full-time equivalent workers that are employed in the GFD Project area, above and beyond a scenario where the GFD Project is not developed.

Figure 22-8 Employment distribution within the GFD Project area, maximum scenario



Source: Deloitte Access Economics, 2013

Note: Employment deviation refers to the number of full-time equivalent workers that are employed in the GFD Project local government areas, above and beyond a scenario where the GFD Project is not developed.

GLNG is a Santos PETRONAS Total KOGAS venture.

Sector impacts

As is to be expected, during the capital intensive stages of the GFD Project the majority of the economic impacts are concentrated in the construction sector. In the moderate scenario, gross value added in the construction sector in the GFD Project area is estimated to increase by \$105 million above the baseline in 2013. There are also gross value added gains throughout the construction supply chain, with increases of \$13 million in manufacturing, \$19 million in trade and \$18 million in the other services sector.

Some of these gains are offset by value added deviations below the baseline, for example a reduction of \$10 million in agriculture in 2013. This is driven by macroeconomic impacts such as the appreciation of the value of the Australian dollar and increased competition for labour (rather than alteration in land use) and are part of normal competitive processes in a modern market economy. It reflects the total agricultural output rather than viability of the individual enterprises, which may be enhanced by a diversified income from land access agreements. Further, any economic output losses are greatly offset by substantial gains in construction, gas, finance and business services over the modelling period 2013 to 2040.

Over the period 2013 to 2040, modelling indicates the regional outputs in the region change, reflecting additional gas production and operations. These include the construction and trade industries, which are predicted to experience the highest increases in gross value added above the baseline, as shown in Table 22-5 and Table 22-6.

Table 22-5 Sector impacts in the GFD Project area, moderate scenario

Modelling sectors*	Gross value added deviation (\$M, 2013)	Gross value added deviation (\$M, 2013-2040 NPV)
Agriculture	-10	-290
Coal	-21	-2,243
Oil	-1	-43
Gas	0	6,600
Other mining	4	8
Manufacturing	13	-40
Electricity	1	-40
Water and waste	2	18
Construction	105	521
Trade	19	225
Transport	1	-27
Communication services	0	5
Finance and insurance services	1	33
Other business services	18	177
Recreation services	6	59
Other services and government	-7	175

Source: Deloitte Access Economics, 2013

*Refers to the sectors that are used in the CGE modelling database. These industries are similar to, but do not completely align with the ANZSIC industry classifications used by the ABS.

Table 22-6 Sector impacts in the GFD Project area, maximum scenario

Modelling sectors*	Gross value added deviation (\$M, 2013)	Gross value added deviation (\$M, 2013-2040 NPV)
Agriculture	-10	-355
Coal	-21	-1,879
Oil	-1	-52
Gas	0	9,456
Other mining	4	97
Manufacturing	12	124
Electricity	1	54
Water and waste	1	46
Construction	102	1,076
Trade	19	480
Transport	1	50
Communication services	0	26
Finance and insurance services	1	94
Other business services	17	374
Recreation services	6	203
Other services and government	-7	273

Source: Deloitte Access Economics, 2013

*Refers to the sectors that are used in the CGE modelling database. These industries are similar to, but do not completely align with the ANZSIC industry classifications used by the ABS.

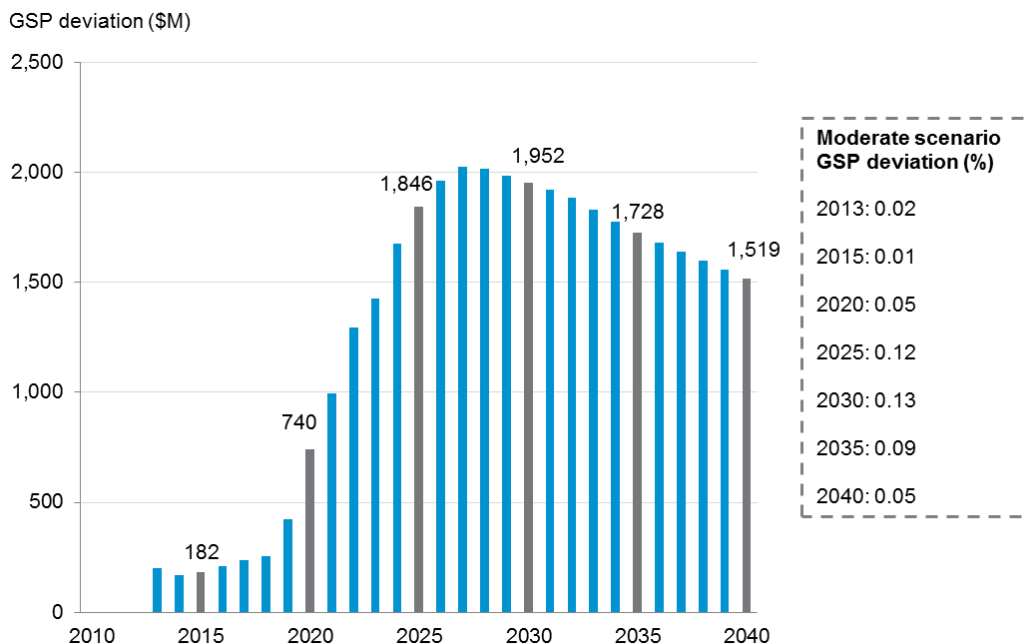
22.5.2 Queensland economic impacts

The GFD Project is expected to contribute to the Queensland economy through the use of labour and intermediary goods and services from across the State. The results presented in this section are cumulative and include the combined value generated in the GFD Project area and the rest of the State.

Gross state product

The moderate scenario is estimated in 2040 to see the GFD Project add a further \$221 million to the Queensland economy (above the \$1.3 billion created in the GFD Project area) — with a total contribution of \$1.5 billion in that year. This equates to an increase in gross state product (GSP) of around 0.05%, as shown in Figure 22-9. The maximum contribution is expected to be around 2027 with an increase in gross state product (GSP) of around 0.14%.

Figure 22-9 GFD Project impacts in Queensland, moderate scenario

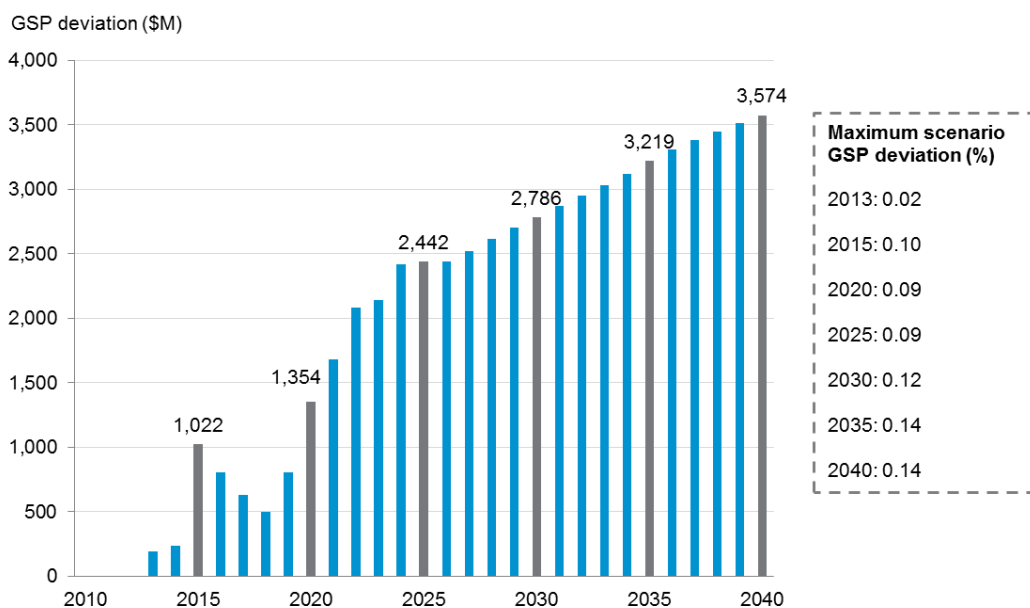


Source: Deloitte Access Economics, 2013

Note: GSP deviation refers to the amount of value add that is generated in Queensland, above and beyond a scenario where the GFD Project is not developed. Values are in real 2012-13 terms.

In the maximum scenario, the GFD Project is expected contribute an additional \$643 million to the State economy in 2040, with a total contribution of \$3.6 billion to GSP. This translates to an increase of around 0.14% in GSP, as shown in Figure 22-10. The year 2040 would be the maximum GSP contribution case in this scenario.

Figure 22-10 GFD Project impacts in Queensland, maximum scenario



Source: Deloitte Access Economics, 2013

Note: GSP deviation refers to the amount of value add that is generated in Queensland, above and beyond a scenario where the GFD Project is not developed. Values are in real 2012-13 terms.

Over the long term, the benefits associated with the GFD Project to the Queensland economy are sizable. Over the period 2013 and 2040, the GFD Project is estimated to contribute between \$12.1 billion (moderate scenario) and \$20 billion (maximum scenario) to Queensland's GSP in NPV terms (see Table 22-7).

Table 22-7 Economic impacts in Queensland

Economic indicator	Scenario	Total economic contribution		
		2013–2025	2026–2040	2013–2040
GSP deviation (NPV, \$M)	Moderate scenario	5,061	6,998	12,059
	Maximum scenario	8,980	11,067	20,047

Source: Deloitte Access Economics, 2013

Note: GSP deviation refers to the amount of value add that is generated in Queensland, above and beyond a scenario where the GFD Project is not developed. NPVs have been calculated using a discount rate of 7%. Values are in real 2012-13 terms.

Employment and wages

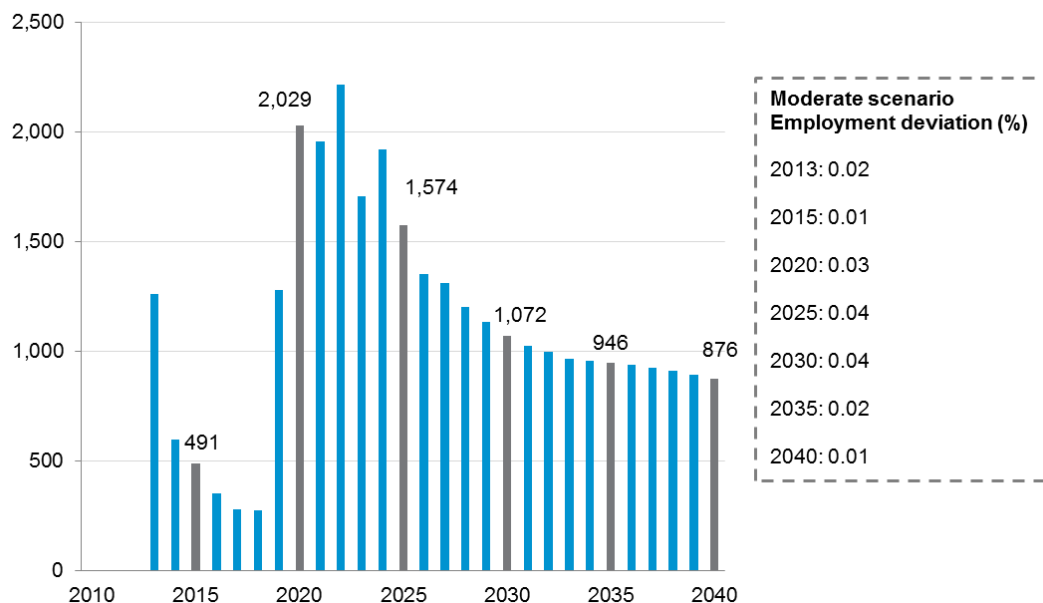
The majority of the construction workforce is likely be sourced from areas outside the GFD Project area, due to the small and constrained nature of local labour markets. While some workers will relocate from other states, the majority are expected to be drawn from within Queensland. There is also likely to be employment gains outside the resources and construction sectors at the State level. This is an important difference between the regional employment gains, which tend to be focused on ground-work activities. For instance, Brisbane has a strong and established resources support hub, providing professional services, maintenance and wholesale trade services to regional gas developments. These capital city-based activities are highly integrated within the regional mining and energy production network. As such, the economic projections are designed to capture both the additional workers employed by Santos GLNG directly and also the jobs created indirectly across resource support industries in Queensland.

Employment impacts in the moderate scenario are at their highest around 2022 at 2,215 FTEs in Queensland). As the GFD Project transitions into a stable operational phase, labour requirements reduce to around 876 FTE workers by 2040 (see Figure 22-11). In the maximum scenario employment is at its highest in 2022 when there is an additional 4,368 FTE jobs added to the Queensland economy. By 2040, employment impacts from the GFD Project average above 1,900 FTE jobs in Queensland (see Figure 22-12).

Beyond the wage rate increases forecast for the GFD Project area, there are limited impacts across the rest of the State. For example, during the construction phase, wages in Queensland are expected to increase by around 0.03% above the reference case in the moderate scenario, peaking at 0.2% in 2024. By 2040, wages in Queensland are projected to be around 0.06% higher than the baseline in the moderate scenario. In the maximum scenario, , wages are projected to increase by around 0.25% during project construction in Queensland, stabilising to 0.20% over the remaining modelling period.

Figure 22-11 Employment impacts in Queensland, moderate scenario

Employment deviation (FTE)

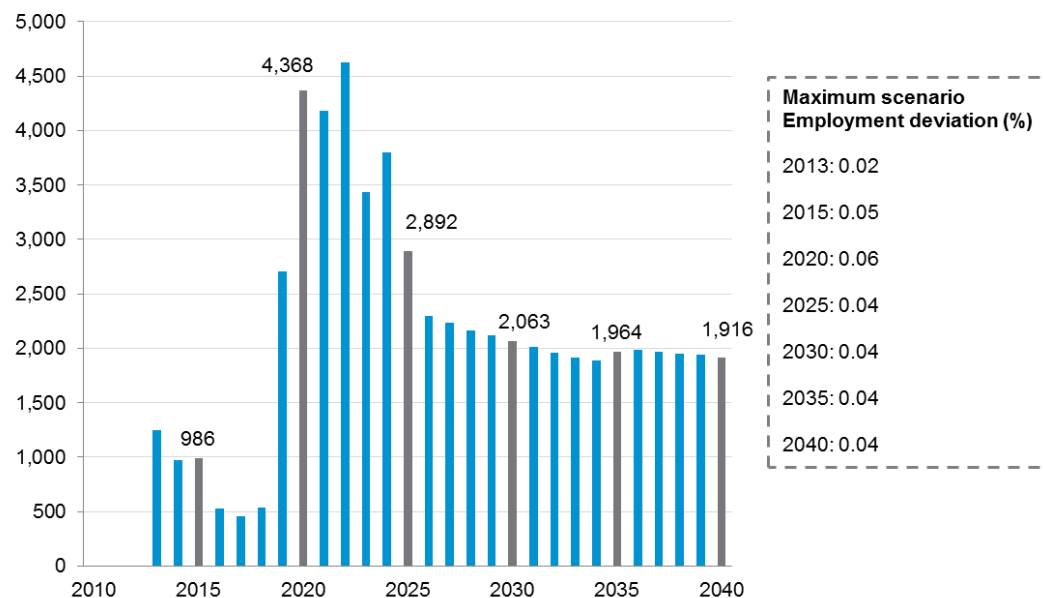


Source: Deloitte Access Economics, 2013

Note: Employment deviation refers to the number of full-time equivalent workers that are employed in Queensland, above and beyond a scenario where the GFD Project is not developed.

Figure 22-12 Employment impacts in Queensland, maximum scenario

Employment deviation (FTE)



Source: Deloitte Access Economics

Note: Employment deviation refers to the number of full-time equivalent workers that are employed in Queensland, above and beyond a scenario where the GFD Project is not developed.

Sector impacts

At the Queensland level, gross value added in the construction sector is expected to be \$186 million above the reference case in 2013 under the moderate scenario (Table 22-8). There are also gains across the rest of Queensland for the trade, finance and insurance, business and recreation service sectors. Incremental gains from the GFD Project area to the State level suggest that some of the demands from the GFD Project are likely to be met by businesses and workers outside the GFD Project area.

On the other hand, gross value added to the Queensland coal sector is estimated to decrease by - \$44 million below the reference case in 2013. This indicates that as more resources are directed towards the GFD Project area, activity that would have otherwise occurred across the rest of Queensland is displaced to some extent.

Despite being projected as an expanding sector at the regional level, gross value added in the manufacturing sector across the rest of Queensland is estimated to decrease by -\$62 million in 2013. This decline accentuates longstanding trends in Australian manufacturing, and is caused by the activity of importing project materials during the construction of the GFD Project.

Over the period 2013 to 2040 the contribution of the GFD Project to the State gas industry remains high, estimated to increase by \$7,325 million in NPV terms at a maximum of \$373 million above the baseline in 2024. Reflecting the increased household spending capacity the recreational services sector is \$1,073 million larger than baseline over the period to 2040 in net present value terms.

Table 22-8 Sector impacts in Queensland, moderate scenario

Modelling sectors*	Gross value added deviation (\$M, 2013)	Gross value added deviation (\$M, 2013-2040 NPV)
Agriculture	-16	-373
Coal	-44	-2,523
Oil	-3	-66
Gas	2	7,325
Other mining	0	-75
Manufacturing	-50	-1,348
Electricity	-5	-93
Water and waste	1	10
Construction	186	1,135
Trade	33	473
Transport	-23	-375
Communication services	0	36
Finance and insurance services	8	283
Other business services	50	581
Recreation services	29	1,073
Other services and government	-9	625

Source: Deloitte Access Economics, 2013

*Refers to the sectors that are used in the CGE modelling database. These industries are similar to, but do not completely align with the ANZSIC industry classifications used by the ABS.

Consistent with the larger financial commitment and resource extraction planned under the maximum scenario, there is greater crowding out between sectors in the GFD Project area and rest of Queensland. For instance, in the maximum scenario 2013, there is projected to be a -\$53 million decrease in manufacturing gross value added outside of the GFD Project area in Queensland.

As shown in Table 22-9, crowding out is also expected for the State's agriculture sector, with gross value added decreasing below the baseline by -\$16 million in 2013. This is driven by macroeconomic impacts such as the appreciation of the value of the Australian dollar and increased competition for labour (rather than alteration in land use) and are part of normal competitive processes in a modern market economy. It reflects the total agricultural output rather than viability of the individual enterprises, which may be enhanced by a diversified income from land access agreements. Further to this, the losses in certain industries are greatly offset by substantial gains in construction, gas, finance and business services over the modelling period 2013 to 2040.

Table 22-9 Sector impacts in Queensland, maximum scenario

Modelling sectors*	Gross value added deviation (\$M, 2013)	Gross value added deviation (\$M, 2013-2040 NPV)
Agriculture	-16	-513
Coal	-45	-2,416
Oil	-3	-90
Gas	9	10,377
Other mining	-1	-41
Manufacturing	-53	-1,890
Electricity	-6	-55
Water and waste	1	30
Construction	183	2,201
Trade	32	882
Transport	-24	-521
Communication services	0	75
Finance and insurance services	8	486
Other business services	49	1,086
Recreation services	28	1,689
Other services and government	-9	912

Source: Deloitte Access Economics, 2013

Note: *Refers to the sectors that are used in the CGE modelling database. These industries are similar to, but do not completely align with the ANZSIC industry classifications used by the ABS.

22.5.3 National economic impacts

Beyond Queensland, the GFD Project is expected to have a modest impact on the national economy. Data presented in this section is cumulative and includes the value generated in the GFD Project area, Queensland and the rest of Australia.

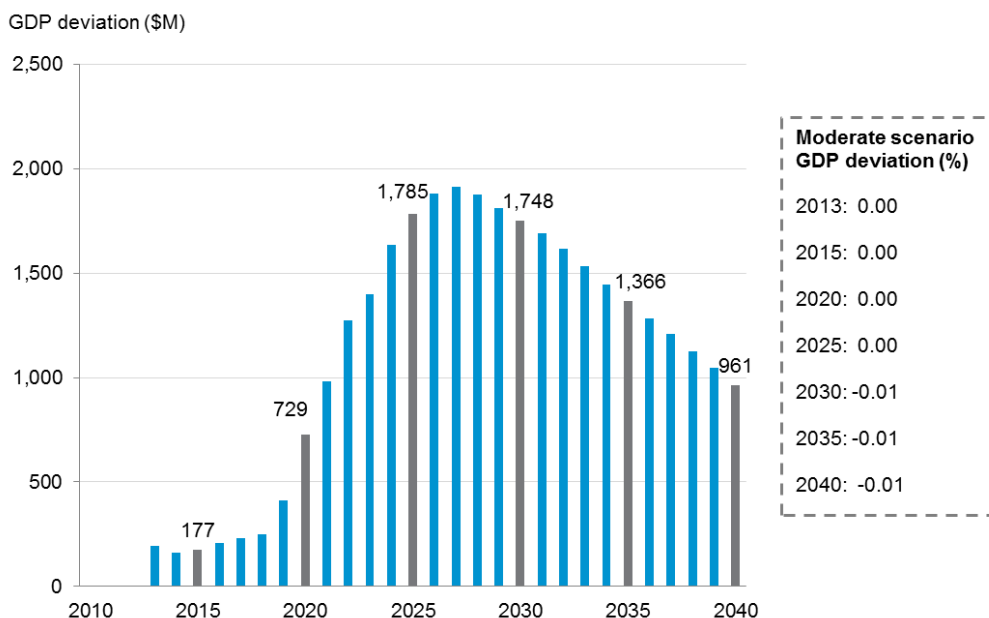
Gross domestic product

While the GFD Project is expected to contribute a considerable amount to the local and Queensland economies, under both scenarios there is a reduction in output across the rest of Australian economy. This suggests that "crowding out" effects will occur as capital and labour from the rest of Australia is reallocated to the GFD Project area and Queensland economy to meet the demands of GFD Project. Indeed, crowding out effects at a national level is a frequently observed feature of investment projects and in the case of the GFD Project, it is relatively minor. Competition for inputs to production processes is integral to the functioning of a market economy in which resources continually shift to where returns are highest.

In the moderate scenario, the GFD Project is estimated to contribute \$961 million to Australia's gross domestic product (GDP) in 2040 — a modest decrease of -0.01% from the reference case, as shown in Figure 22-13.

Under the maximum scenario, the GFD Project will contribute \$2.8 billion by 2040 to the national economy as shown in Figure 22-14. While there are overall gains in the GFD Project area and Queensland, the modelling indicates that output across the rest of the Australia economy will record a very small decline of about \$145 million in 2040. This translates to a reduction of output of -0.03% from the reference case without the GFD Project.

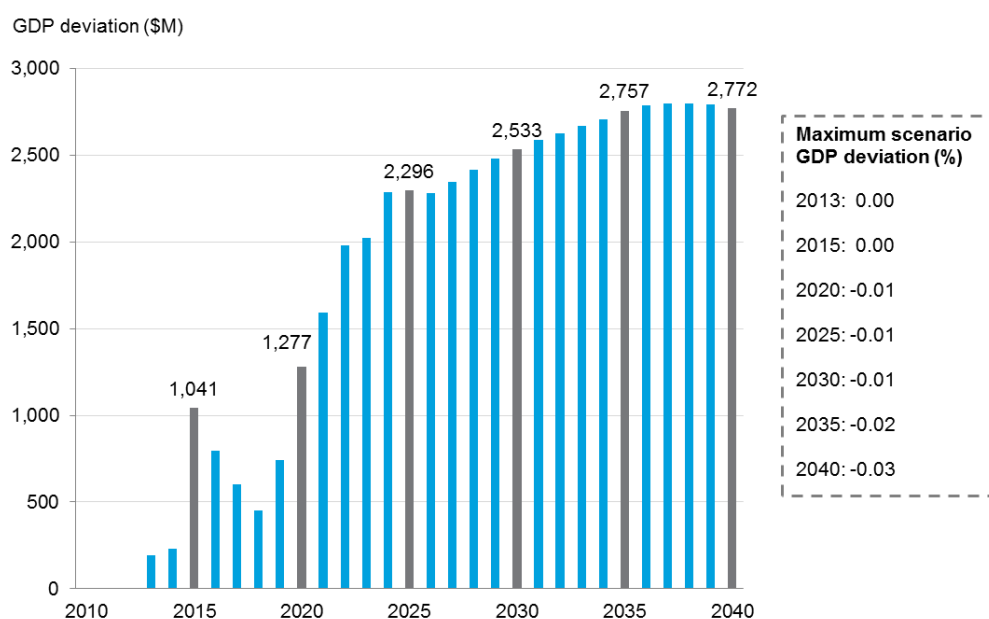
Figure 22-13 GFD Project impacts in Australia, moderate scenario



Source: Deloitte Access Economics, 2013

Note: GDP deviation refers to the amount of value add that is generated in Australia, above and beyond a scenario where the GFD Project is not developed. Values are in real 2012-13 terms.

Figure 22-14 GFD Project impacts in Australia, maximum scenario



Source: Deloitte Access Economics

Note: GDP deviation refers to the amount of value add that is generated in Australia, above and beyond a scenario where the GFD Project is not developed. Values are in real 2012-13 terms.

Figure 22-10 details the GFD Project's impact on key macroeconomic variables over different time periods. Over the period 2013 and 2040, the GFD Project is estimated to contribute between \$10.9 billion (moderate scenario) and \$18.3 billion (maximum scenario) to Australia's GDP in NPV terms.

Table 22-10 Economic impacts in Australia

Economic indicator	Scenario	Total economic contribution		
		2013–2025	2026–2040	2013–2040
GDP deviation (NPV, \$M)	Moderate scenario	4,953	5,998	10,951
	Maximum scenario	8,571	9,730	18,301

Source: Deloitte Access Economics, 2013

Note: GDP deviation refers to the amount of value add that is generated in Australia, above and beyond a scenario where the GFD Project is not developed. NPVs have been calculated using a discount rate of 7%. Values are in real 2012-13 terms.

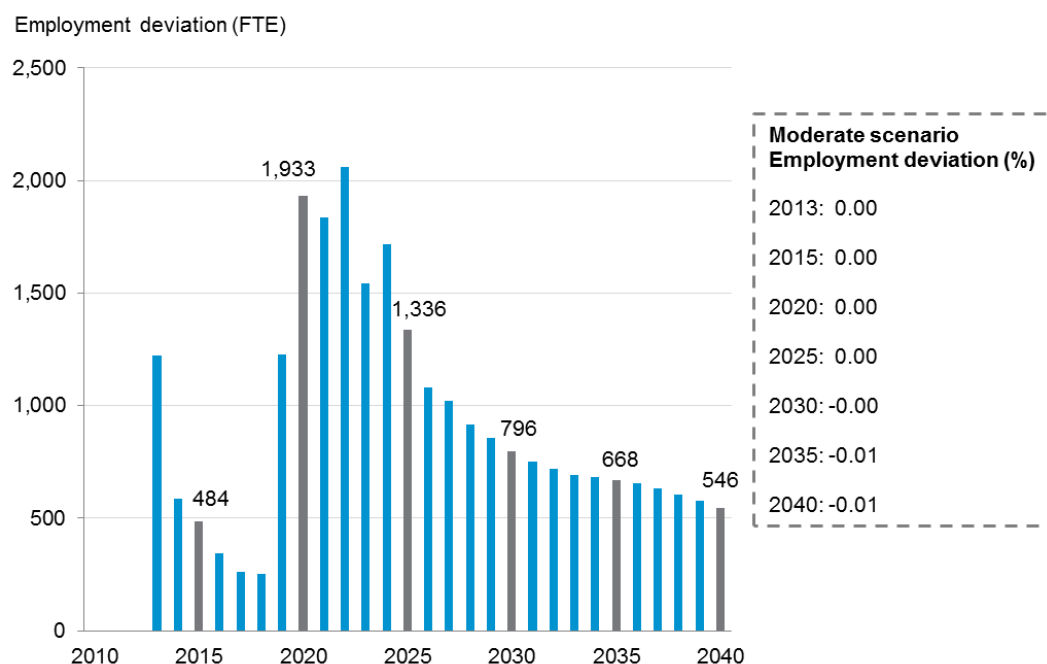
Employment and wages

At the national level, employment impacts are generally distributed across broader sectors of the economy. This occurs through the extensive linkages between operations in the GFD Project area and supply sectors located across Australia.

In the moderate scenario, these wider employment gains are muted. This indicates that the GFD Project will draw more employees from the rest of the Australian workforce (largely through contractors) than the number of jobs created in supply industries outside of Queensland. Once again, there is a crowding out effect as labour from the rest of Australia is reallocated, or transferred to form part of the GFD Project. This results in a net loss of 330 FTE employees by 2040. In a cumulative sense, there is still a gain to national employment of 2,060 FTE employees when the GFD Project workforce is at its highest in 2022; this reduces to 546 FTE workers as the gas fields start to come offline, as shown in Figure 22-15. As employment moves towards Queensland, the wage rate across the rest of Australia is also expected to decrease by a minor extent of around -0.01% and -0.03% over the life of GFD Project development and operation in the moderate scenario.

In the maximum scenario, there is a small reduction in the rest of Australian employment. Specifically, there is a net loss of 180 FTE workers in 2025 and 590 FTE employees by 2040. In share terms, employment in the rest of Australian economy decreases by an almost negligible -0.01% below the baseline in 2040, as shown in Figure 22-16. As employment moves towards Queensland the corresponding wage impacts show a slightly decrease in wage rates across the rest of Australia of between -0.02% and -0.05% over 2013 to 2040.

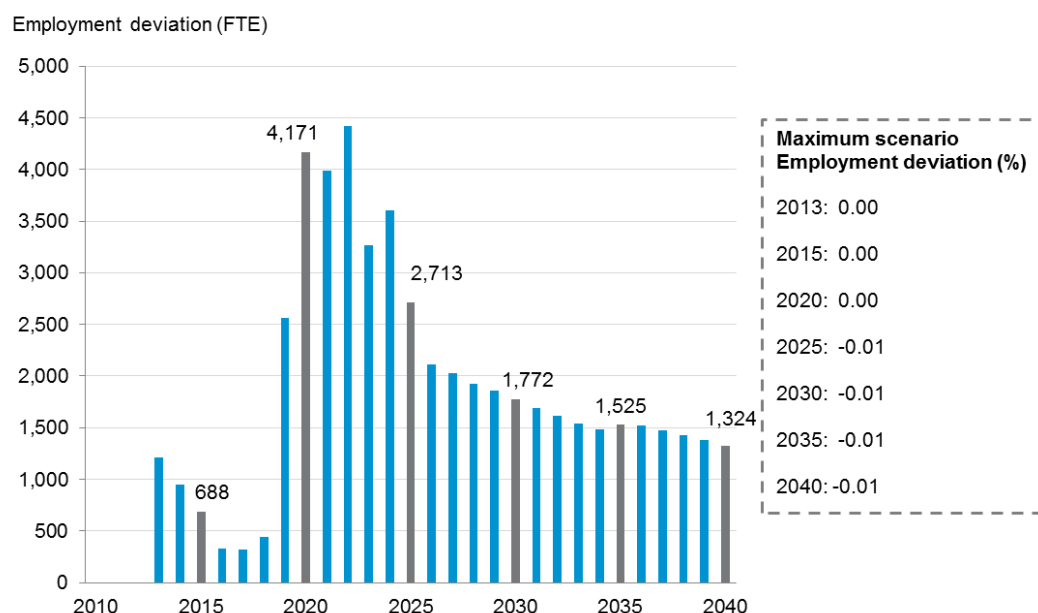
Figure 22-15 Employment impacts in Australia, moderate scenario



Source: Deloitte Access Economics, 2013

Note: Employment deviation refers to the number of full-time equivalent workers that are employed in Australia, above and beyond a scenario where the GFD Project is not developed.

Figure 22-16 Employment impacts in Australia, maximum scenario



Source: Deloitte Access Economics, 2013

Note: Employment deviation refers to the number of full-time equivalent workers that are employed in Australia, above and beyond a scenario where the GFD Project is not developed.

Sector impacts

Outside of Queensland, while the GFD Project displaces some of the economic activity in other states and territories across the rest of Australia, the sectoral losses in gross value added are relatively small. The manufacturing industry presents the most significant reduction in value added at the national level, with gross value added decreasing by -\$66 million at the national level.

GLNG is a Santos PETRONAS Total KOGAS venture.

There are also positive gains ranging between \$3 million to \$6 million to businesses in sectors in other parts of the country due to the widespread demand spillovers from the GFD Project in 2013.

Over the life of the GFD Project, crowding out between the gas sector and other sectors of the economy becomes more evident. This is driven by macroeconomic impacts such as the appreciation of the value of the Australian dollar and increased competition for labour and are part of normal competitive processes in a modern market economy. In the case of other businesses and recreational services, significant economic gains in the GFD Project area and the rest of Queensland mean that there are still overall gains to these sectors despite small losses across the rest of Australia.

Table 22-11 outlines the sectoral impacts of the GFD Project at the national level under the moderate scenario (i.e. the sum of results for region, Queensland and rest of Australia).

Table 22-11 Sector impacts in Australia, moderate scenario

Modelling sectors*	Gross value added deviation (\$M, 2013)	Gross value added deviation (\$M, 2013-2040 NPV)
Agriculture	-16	-427
Coal	-42	-2,392
Oil	-4	-97
Gas	1	7,559
Other mining	0	-119
Manufacturing	-66	-1,946
Electricity	-2	24
Water and waste	3	73
Construction	183	910
Trade	39	463
Transport	-22	-400
Communication services	3	101
Finance and insurance services	6	202
Other business services	48	416
Recreation services	26	892
Other services and government	-4	711

Source: Deloitte Access Economics, 2013

*Refers to the sectors that are used in the CGE modelling database. These industries are similar to, but do not completely align with the ANZSIC industry classifications used by the ABS.

The sectoral crowding out is projected to be greater under the maximum scenario. In 2013, the capital requirements of GFD Project development displace construction and manufacturing activities that would have otherwise occurred across the rest of Australia (Table 22-12).

Despite this, the overall gains to the Australian construction industry due to the GFD Project remain high in 2013, with gross value added in this sector increasing \$180 million above the baseline in 2013 under the maximum scenario. There are also considerable net economic benefits for the other businesses, recreation services, and trade.

Table 22-12 outlines the sectoral impacts of the GFD Project at the national level under the maximum scenario (i.e. the sum of results for the GFD Project Area, Queensland and rest of Australia).

Table 22-12 Sector impacts in Australia, maximum scenario

Modelling sectors*	Gross value added deviation (\$M, 2013)	Gross value added deviation (\$M, 2013-2040 NPV)
Agriculture	-16	-603
Coal	-42	-2,298
Oil	-4	-142
Gas	8	1,0792
Other mining	0	-107
Manufacturing	-69	-2,810
Electricity	-2	90
Water and waste	3	126
Construction	180	1,846
Trade	38	869
Transport	-22	-563
Communication services	3	182
Finance and insurance services	6	358
Other business services	46	826
Recreation services	26	1,406
Other services and government	-4	1,050

Note: *Refers to the sectors that are used in the CGE modelling database. These industries are similar to, but do not completely align with the ANZSIC industry classifications used by the ABS.

Source: Deloitte Access Economics, 2013

22.5.4 Fiscal impacts

Over its expected life, the GFD Project will produce large volumes of gas to support the GLNG Project. This long-term production platform and commensurate gas sales will generate new sources of tax revenue for the Queensland and Commonwealth governments.

The taxation arrangements for large LNG projects are complex, as is the interaction between taxation regimes. Oil and gas companies in Queensland are primarily subject to corporate income tax (30%), Queensland Government royalties (10%) and the petroleum resource rent tax (40% of profits).

To provide a broad estimate of the tax that the GFD Project is likely to pay over the period to 2040, two sensitivities were developed where the base level of resource tax is paid to at:

- **Low** — 2.5% of the GFD Project's gross sales value
- **High** — 5.0% of the GFD Project's gross sales value.

Corporate tax accounts for a relatively large proportion of the total tax payable, although corporate taxes are slightly lower under the high scenario as higher resource taxes reduce the level of taxable profit.

Under the moderate scenario the fiscal impacts from 2013–2040 are expected to be around \$2.8 billion under the low case sensitivity and \$3.1 billion in the high case in NPV terms, as shown in Table 22-7.

Table 22-13 Fiscal impacts of GFD Project, moderate scenario

Sensitivity	Component	Total tax payable		
		2013–2025	2026–2040	2013–2040
Low case (NPV, \$M)	Commonwealth government (incl. corporate taxes and PPRT)	543	1,980	2,523
	State government (incl. royalties)	133	195	328
	Total	676	2,175	2,851
High case (NPV, \$M)	Commonwealth government (incl. corporate taxes and PPRT)	511	1,922	2,433
	State government (incl. royalties)	266	389	656
	Total	778	2,311	3,089

Source: Deloitte Access Economics

Note: NPVs have been calculated using a discount rate of 7%. Values are in real 2012-13 terms.

The estimated fiscal impact of the GFD Project for the maximum scenario is shown in Table 22-14. The total tax payable over the period 2013–2040 is estimated to be \$4.1 billion under the low case and \$4.4 billion in the high case in NPV terms.

Table 22-14 Fiscal impacts of GFD Project, maximum scenario

Sensitivity	Component	Total tax payable		
		2013–2025	2026–2040	2013–2040
Low case (NPV, \$M)	Commonwealth government (incl. corporate taxes and PPRT)	958	2,658	3,615
	State government (incl. royalties)	189	278	467
	Total	1,147	2,935	4,082
High case (NPV, \$M)	Commonwealth government (incl. corporate taxes and PPRT)	920	2,574	3,494
	State government (incl. royalties)	378	556	934
	Total	1,298	3,130	4,428

Source: Deloitte Access Economics, 2013

Note: NPVs have been calculated using a discount rate of 7%. Values are in real 2012-13 terms.

22.5.5 Other impacts

Impacts of a non-resident workforce

Non-resident workforces have become a noted characteristic of resource project development across Australia in the last decade. In the context of the GFD Project, it is likely that around 2,000 FTE non-resident workers at a maximum will be required during the construction phase, which will scale down to between 150 to 250 FTE non-resident workers during the operational phase.

The presence of non-resident workers can significantly increase the level of economic activity in an area. They can raise the demand for basic goods and services, providing second order and catalytic revenues for local businesses and new job opportunities for locals.

In addition where wages are repatriated to families and leisure time is spent away from the employment region money is generally expended in other regions of Queensland and Australia.

Cost of living pressures

While price increases, especially for essential housing services, will impact the cost of living, the welfare implications are determined by other variables such as economic growth, employment and investment. In this regard, cost of living pressures stem from strong investment, rising incomes and low unemployment — each of which are crucial factors underpinning community living standards. While local property markets have experienced price increases over the last four years for three bedroom houses (31% for Roma, 49% for Injune and 43% for Wallumbilla), the rate of growth has appeared to plateau over the last twelve months. Median rents for new bonds in Roma have increased for three bedroom houses by 24% per year for the past two years to March 2013, and vacancy rates are still extremely low at around 1.5%.

This pattern is not exclusive to the GFD Project area, with rising property and rental costs seen across the State. During the initial years of the GFD Project as development activity increases, it is expected that additional land will be released for housing in key regional centres or more temporary dwellings will be made available (often in conjunction with project proponents). Indeed, the rental market is showing signs of adjustment, with median prices continuing to fall.

Local industry participation

As stated in section 22.5.1, Santos GLNG estimates that approximately 85% of intermediary inputs for the GFD Project will be sourced domestically, with around 45% sourced from regional Queensland — giving local businesses opportunities to benefit from GFD Project development. Thus, there will be considerable opportunities for local service industries to secure key elements of GFD Project work and ultimately gain from the technology transfer, skills development and commercial engagement processes. This will provide opportunities for other economic activities in the future.

Government infrastructure

Santos GLNG will work with government to manage economic impacts on infrastructure and other government functions generated by the GFD Project. For example, this will include ongoing assessment of impacts to roads as discussed in section 11.6 of Section 11: Traffic and transport and social and community facilities through the social impact management plan as discussed in section 21.6 of Section 21: Social.

Major hazards

The measures to be implemented to manage potential hazards generated by the GFD Project are discussed in section 23.6 of Section 23: Health and safety and section 24.6 of Section 24: Preliminary hazard and risk. The costs of implementing these measures are included in the GFD Project costs.

Demand for carbon-efficient energy

Global demand for energy continues to rise, with energy consumption anticipated to grow by more than 56% between 2010 and 2040 (Energy Information Agency, 2013). Coupled with the increasing demand for energy, demand for gas has outstripped that of other fossil-fuel based energy sources based on its energy efficiency and its ease of transmission and distribution once converted to LNG (ABARE, 2011; IEA, 2013).

The GLNG Project is one of Australia's major LNG projects and the expansion offered by the GFD Project will increase Santos GLNG's capacity to meet global energy needs.

Impacts on other extractive projects

The impacts on existing and future extractive projects, such as coal extraction is discussed and assessed in section 9.3 of Section 9: Land resources.

Impacts on other sectors

Although net economic benefits from the GFD Project are positive at a regional, State and national level, there is likely to be a smaller degree of crowding out between geographies and sectors of the economy. In particular, some activity in the manufacturing sector across Queensland and the rest of Australia is likely to be displaced by the increase in demand in the regional GFD Project area.

22.6 Mitigation measures

Santos GLNG is committed to working with government, industry and the community to manage economic impacts with specific focus on addressing economic issues and local industry participation. Santos GLNG is committed to implementing the measures detailed in Table 22-15 to mitigate negative economic impacts from the GFD Project.

Table 22-15 Mitigation measures – economic

Management plan	Commitment
Social impact management plan (SIMP)	<p>The SIMP established for the GLNG Project will be implemented across the GFD Project. The plan outlines the roles, responsibilities and rights of Santos GLNG, the government, impacted communities and other stakeholders in relation to the GFD Project. In particular, it outlines the framework for community engagement, management strategies to avoid, mitigate or minimise potential impacts and to maximise opportunities and benefits arising throughout the life of the GFD Project, as well as a monitoring and reporting process.</p> <p>The GLNG Project SIMP will be supplemented by issue action plans relating to the GFD Project that focus on the following key areas as agreed with the Coordinated Project Delivery Division of the Coordinator-General's office:</p> <ul style="list-style-type: none"> • Water and environment • Community safety • Social infrastructure • Community wellbeing and liveability • Local industry participation and training • Aboriginal engagement and participation. <p>The SIMP is an operational document that is updated to reflect the ongoing needs of Santos GLNG and the communities it operates in. It is available on the web at:</p> <p>http://www.santosglng.com/resource-library/community/social-impact-management-plan-community-handbook.aspx</p>
Queensland Resources and Energy Sector <i>Code of Practice for Local Content</i>	<p>In 2013, Santos GLNG engaged with the QRC and other resource proponents to develop a new local content code. While the code is voluntary, it is underwritten by reporting, information sharing and an administrative framework. The code has since been endorsed by the Queensland Government. Across its existing and new operations, under the code, Santos GLNG has committed to:</p> <ul style="list-style-type: none"> • Providing full, fair and reasonable opportunities for businesses to bid for contracts • Improving local industry participation, capability and competitiveness • Enhancing liveability in rural communities by maximising employment, training and apprenticeship programs. <p>Santos GLNG has adopted <i>Code of Practice for Local Content</i> and will implement it for the GFD Project. Adoption of the code replaces the requirement for producing a local industry participation plan.</p>

22.7 Conclusions

The potential direct and flow-on economic benefits offered by the GFD Project result from:

- Investment in upstream gas production, processing facilities and other supporting infrastructure
- Export revenues generated from additional LNG production as the GFD Project supplies the existing LNG facility at Curtis Island in Gladstone
- Additional employment activity
- Increased fiscal receipts to the Queensland and Commonwealth Governments in the form of taxes and royalties.

The economic analysis indicates that the GFD Project would have a significant positive impact on the regional, State and national economies.

A summary of the economic impacts is provided in Table 22-16. Results are presented as cumulative impacts, with the results for Queensland inclusive of the impacts across the GFD Project area and rest of Queensland, while Australia results are inclusive of impacts to the GFD Project area, Queensland and the rest of Australia.

Table 22-16 Summary of the cumulative economic impacts

Economic region	Economic output (NPV, \$M)				Employment average (FTE) 2013–2040
	2020	2030	2040	2013–2040	
Moderate scenario					
GFD Project area	622	1,505	1,298	9,795	616
Queensland	740	1,952	1,519	12,059	1,123
Australia	729	1,748	961	10,951	929
Maximum scenario					
GFD Project area	1,114	2,392	2,931	16,882	1,337
Queensland	1,354	2,786	3,574	20,047	2,182
Australia	1,277	2,533	2,772	18,301	1,904

Source: Deloitte Access Economics, 2013

Note: NPVs have been calculated using a discount rate of 7%. Values are in real 2012–13 terms.

Other economic impacts from the GFD Project could include:

- Increase in the non-resident workforce, which can potentially increase the level of economic activity in the area through raising the demand for basic goods and services; where wages are repatriated to families and leisure time is spent away from the employment region, money is generally expended in other regions of Queensland and Australia Increase in the cost of living within the GFD Project area
- Increased participation opportunities for local industries.

Santos GLNG is committed to working with government, industry and the community to manage economic impacts with specific focus on addressing issues around workforce and housing through its social impact management plan and on increasing local industry participation through its adoption of the QRC Code of Practice for Local Content.