Australia Pacific LNG Project

Volume 4: LNG Facility

Chapter 21: Economic Impact Assessment

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1. Economic impact assessment

1.1 Introduction

1.1.1 Purpose

This chapter of the environmental impact statement (EIS) forms the economic impact assessment of the liquefied natural gas (LNG) facility component of the Australia Pacific LNG Project (the Project). Economic impact assessment assesses the economic impacts associated with the development, construction and operation of the LNG facility as well as the impact of the Project as a whole to the regional, state and national economies. It identifies the nature, magnitude and significance of economic impacts and identifies appropriate measures for impact management and mitigation, designed to reduce negative impacts and enhance the positive benefits. There are three steps in the economic impact assessment process:

1. Baseline assessment of the existing economic environment
2. Identification and assessment of potential impacts
3. Identification of mitigation measures and opportunities for enhancement.

The mitigation measures have been further discussed through the social impact assessment detailed in Volume 4 Chapter 20.

Development of the LNG facility has the potential to impact on the existing economic environment of the local and regional economies in which it is located. Of Australia Pacific LNG's 12 sustainability principles, a relevant subset will be applied to the planning, design, construction and operation of the LNG facility to ensure that such impacts are avoided or minimised.

In the context of the existing economic environment, Australia Pacific LNG will contribute to sustainable development by:

- Fostering the health and wellbeing of its workforce
- Respecting the rights, interests and diverse cultures of the communities in which it operates
- Working cooperatively with communities, governments and other stakeholders to achieve positive social and environmental outcomes, seeking partnership approaches where appropriate Upholding exemplary ethical behaviour in all aspects of its business
- Identifying, assessing, managing, monitoring and reviewing risks to its workforce, its property, the environment and the communities affected by its activities.

Guided by these principles, Australia Pacific LNG will work with and through communities to build their capacities to enhance the benefits flowing from the Project, and to adjust to the changes in the economic environment. Mechanisms to achieve this are outlined in this economic impact assessment. Identifying opportunities for local and regional businesses and adopting strategies to reduce stress on housing and the local labour pool, and acting on these early through participatory mechanisms, will play a key role in contributing to sustainable community development.

Strategies for enhancing employment opportunities for local and regional residents while seeking to mitigate disruptive impacts of the Project workforce requirements on the existing local and regional labour pool is a key focus of the economic impact assessment. Training programs will be designed so

that they support the development of the Project while simultaneously providing diverse transferable skills that provide employees with long-term career paths.

A key element of sustainability is partnerships. As such, strategies identified in the economic impact assessment adopt a collaborative approach with industry, government and community stakeholders to increase the likelihood of success and enhance contribution towards sustainable economic development.

1.1.2 Scope of work

The economic impact assessment has been completed according to the terms of reference (TOR) for the Project as set by the Queensland Coordinator-General. The TOR requires Australia Pacific LNG to describe the existing economic environment, assess identified and associated economic impacts and present appropriate mitigation strategies. In particular, the TOR requires the Project to assess:

- The relative significance of this proposal in the local, regional, state and national economic context
- The extent to which local and other Australian goods and services will be used
- The short and long-term beneficial (e.g. job creation) and adverse (e.g. competition with local small business) impacts that are likely to result from the development
- The need for any additional infrastructure provision by government to support the Project
- Implications for future development in the locality (including constraints on surrounding land uses and existing industry)
- The impact of living standards at the local, regional and state level.

The TOR also requires Australia Pacific LNG to identify any new skills and training to be introduced in relation to the Project and indicate the occupational skill groups required and potential skill shortages anticipated.

1.1.3 Economic impact assessment terminology

The economic impacts on the economy, consumers and other industries associated with the construction and operational scenarios of the Project are explained through a number of indicators using specific economic terminology. Terminology used extensively through this chapter is defined below.

- **Gross regional output**: the gross value of business turnover
- **Value added**: the difference between the gross value of business turnover and the costs of raw materials and other factors of production brought in to produce the output
- **Household income**: the wages paid to employees including the imputed wages paid to self-employed contractors and business operators
- **Employment:** the number of people employed, including full-time and part-time
- **Initial stimulus:** this represents the contribution made by the project specifically to the economy
- **Direct impacts:** this represents the direct flow-on effects that the project has into the business sector through the purchase of goods and services from other sectors in the economy

- **Indirect impacts**: this represents the sum of two types of 'trickle down' effects. The first are the induced effects on other businesses as a consequence of the direct effects, while the second are the induced impacts on final household demand as a consequence of higher employment across all sectors
- **Standard of living**: in context of the economic assessment, increases to standards of living are calculated based on the increased consumption by households on non-essential goods and services. This does not take into account environmental and social factors.

1.1.4 The study area

The proposed site for the LNG facility is within the Curtis Island Industry Precinct of the Gladstone State Development Area (GSDA), Gladstone. The economic impact assessment study area for the LNG facility's local economic environment has been defined geographically according to the following statistical local areas (SLAs) as classified by the ABS 2007 (Figure 1.1):

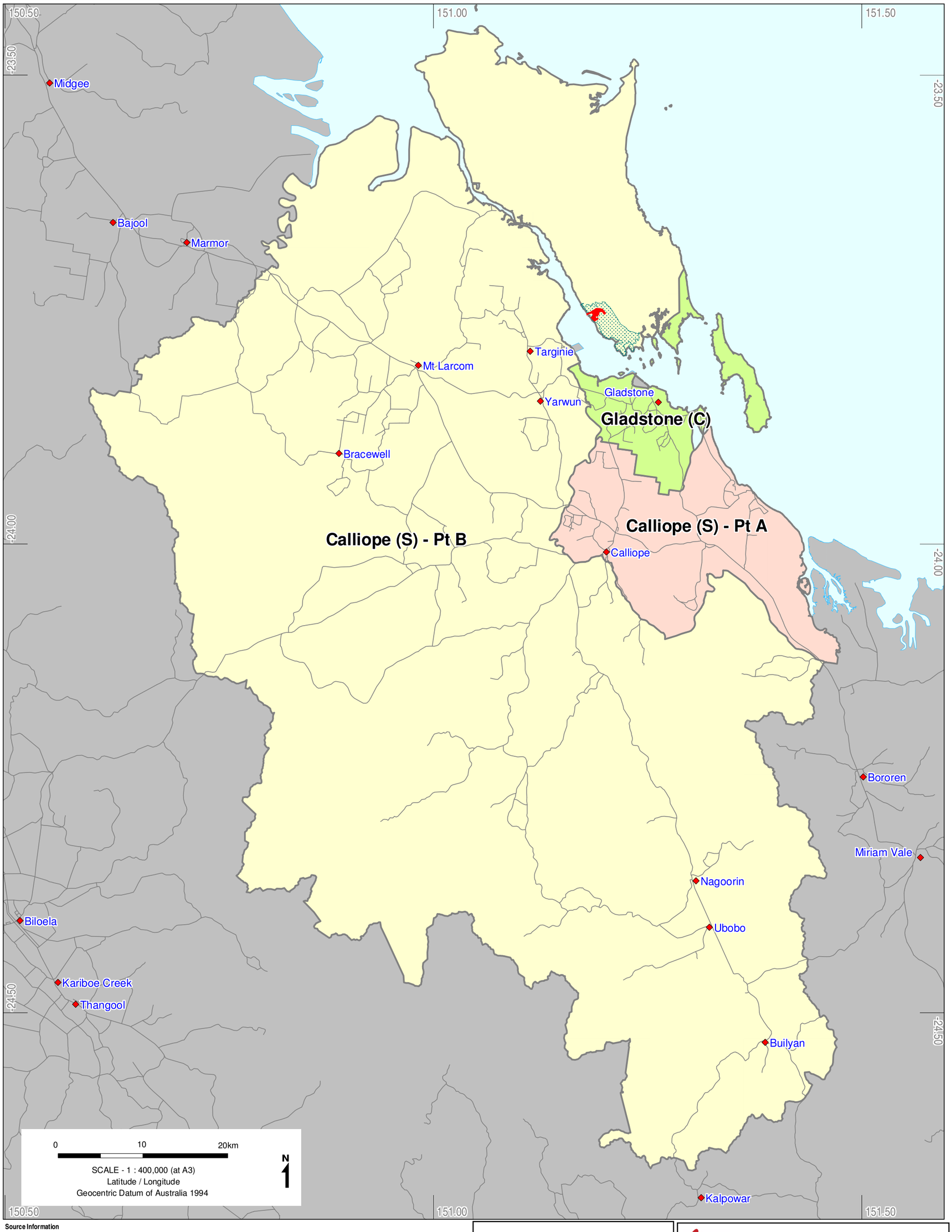
- Gladstone
- Calliope Pt A
- Calliope Pt B.

The economic impact and contribution of the Project however is anticipated to extend to the regional, state and national economies. As a result the direct and indirect economic impacts at three geographic levels have been modelled: the national economy of Australia, the state of Queensland, and the regional economy of Fitzroy (Mackay-Fitzroy-Central West) within which Gladstone is located.

1.2 Methodology

1.2.1 Economic baseline

Data pertaining to the existing economic environment has been sourced from government agencies, for example the Australian Bureau of Statistics (ABS) and the Department of Education, Employment and Workplace Relations. The most up-to-date data is used wherever possible, however many data sets, particularly the ABS Census where much information is sourced, have a time lag of several years between collection and publication. In the context of this EIS, the baseline has a number of roles. First, the baseline report provides a general description of the economy in the area of interest leading to an understanding about the key drivers for the economy and the types of industry relationships that may exist. Second, the baseline report provides an overview of the key sectors or services in the economy that are likely to provide inputs to the Project which has assisted in the identification of likely impacts on those sectors. Third, the baseline report describes other key sectors that may be subject to indirect or induced economic impacts of the Project. This has provided the basis for predicting the level of likely impact and the potential application of mitigation strategies.



Source Information

Statistical Local Area Digital Boundaries (ASGC 2006) sourced from http://www.abs.gov.au on 29/08/2007

Statistical Local Area boundaries - the letters in parenthesis following the name of individual SLAs refers to the ABS classification of SLAs as either town (T), shire (S) or city (C).

LEGEND

- Town
- Road
- LNG facility site
- Curtis Island Industry Precinct
- **Statistical Local Area**

AUSTRALIA PACIFIC LNG

AUSTRALIA PACIFIC LNG PROJECT

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Figure 21.1 LNG Facility study area: local economic environment

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1.2.2 Economic modelling

Australia Pacific LNG engaged KPMG Econtech to undertake economic modelling to identify the economic impact of the Project on the local, regional, state and national economies. Details regarding the methodology used are outlined below. Further information is provided in the economic technical report in Volume 5 Attachment 44. It should be noted that the economic impacts are modelled for the whole of the Project (from the gas fields through to the LNG facility) so that the impacts can be examined and mitigated in a holistic manner.

Project scenarios

To simulate the economic impacts of the Project, three project scenarios were modelled:

- Scenario 1 (baseline scenario): This scenario assumes that the proposed additional LNG exports and natural gas production resulting from the Project does not proceed
- Scenario 2 (construction scenario): This scenario models the average annual economic impacts of constructing the Project over the ten year construction phase. The average annual impact in the four peak years has also been modelled. Scenario 2 was modelled with KPMG Econtech's MMR model
- Scenario 3 (operational scenario): This scenario assumes that the Project's production of coal seam gas (CSG) and LNG increases by the amount expected from the Australia Pacific LNG Project. Scenario 3 was modelled with KPMG Econtech's MM600+ model.

The differences in economic outcomes between the construction and operational scenarios and the baseline scenario are calculated to determine the estimated economic impacts of each stage of the Project.

Scenario 2 - construction

For the construction scenario of the Project, the impacts on the Australian economy were estimated using KPMG Econtech's MMR model. MMR is a computerised general equilibrium (CGE) model and has been used as it is designed to estimate the effects of policies or projects that are state or region specific over the medium term. This allows the model to capture the construction impacts more effectively than a long-run model, as the impacts do not last long after the construction is completed. Importantly, the modelling simulates the average effect of the construction during the 10 years of construction of the Project. The MMR model divides Australia into 33 regions with 18 industries corresponding to the Australian and New Zealand standard industry classifications (ANZSIC) used by the ABS. Each region is modelled individually but following a consistent approach.

The economic impacts of the construction stage of the Project in the short to medium-term will arise as a result of the direct stimulus that is provided to the economy through investment in the construction of the CSG operations, pipeline and LNG facility. The economic impacts will mainly manifest in construction related industries, as new buildings and infrastructure are erected. The extent to which these direct impacts are expected to flow through to the rest of the economy and cause second round effects are identified and quantified by economic modelling. This happens as the supply chain of the construction industry is stimulated and as business and consumer demand is encouraged within the regional economy.

The assumptions used in modelling the economic impact of the Project are based on the construction of four LNG Trains between 2011 and 2020. The peak construction period for the construction of Train

1 and Train 2 occurs in 2013, in which an estimated 2,100 construction workers will be required. The peak construction period for Train 3 and Train 4 occurs in 2018, where an estimated 2,100 construction workers will also be required. Construction workforce requirements between 2015 and 2016 are smaller (approximately 400 workers) as the construction of the first two LNG trains is completed and gradual ramping up occurs for the construction of the second two LNG trains.

Australia Pacific LNG is aiming to source at least 20% of its construction labour force locally (those workers who live within 60km of the Gladstone general post office). The remaining workforce requirements will be met by non-local workers, residing in the proposed temporary accommodation facility at the Project construction site on Curtis Island. Based on these assumptions, at peak a maximum of 1,680 workers will work a fly-in/fly-out (FIFO) or drive-in/drive-out (DIDO) roster (nominally four weeks on, one week off) and the remaining 420 will reside locally within the Gladstone housing market.

Australia Pacific LNG is committed to sourcing employees locally where possible to achieve numbers greater than 20% local employment. The more conservative 20% local workforce scenario has been used to model the economic impact of the project due to the large number of projects proposed to be undertaken concurrently in Gladstone, thus further reducing the availability of local employees. The cumulative impact scenario (detailed below) will impact the Gladstone social and economic environment as well as the ability of projects to source labour.

Scenario 3 – operational

The operational scenario is used to examine the impacts of the Project during the operational phase. The operational scenario impact has been estimated using KPMG Econtech's MM600+ model. The MM600+ is a long-term CGE model of the Australian economy that models a long-run equilibrium (approximately 5 to 10 years). It distinguishes 108 industries that produce 672 products, importantly distinguishing LNG from natural gas and oil production.

The MM600+ model is able to capture the project-life impacts more effectively than a short to medium-run model, as it is not influenced by short run fluctuations. This provides a more accurate representation of the impacts of the projects once it is in normal operation mode.

The average project-life effects of the Project to the regional economies of Mackay-Fitzroy-Central West and Darling Downs-South West Queensland (which incorporates the Project area), and to the Queensland economy are also estimated using MM600+.

Operational workforce assumptions for the economic assessment are summarised in Table 1.1. The operation of the first two LNG Trains is expected to require a workforce of 175, which will then ramp up to 325 between 2018 and 2020 as operations of Train 3 and Train 4 commence. During the operational phase of the Project it is expected that a workforce of 100 will be required to operate the first LNG Train, with an approximate additional 75 people required for each additional train. Full development to four LNG Trains will require an approximate total workforce of up to 325 people. For the purposes of the economic assessment, it is assumed that all operations staff will reside within the Gladstone housing market.

Table 1.1 Operational workforce requirements

Year	Workforce estimate
2014	100
2015	175
2016	175
2017	175
2018	175
2019	250
2020	325

Source: Australia Pacific LNG

Benefits of CGE models

CGE models like MM600+ and MMR provide better estimates than input-output models because they take into account that: the structure of the economy will respond to changes in relative prices and so is not rigid; and that there are important long-run national economic constraints in the following areas – labour supply, budget balance, external balance and private savings. This makes CGE modelling results more conservative but also more realistic. Further, MM600+ provides estimates of average effects over the operational phase. This is important because project changes should be judged against their overall impacts, not just their impacts in a particular year. The MM600+ model will also capture any substitution and flow on effects arising from a particular project. Furthermore, the economic models used to assess the economic impacts of the Project (MMR and MM600+) are the same as those used in a report prepared for the Queensland Government into the viability and economic impact of the LNG Industry to Queensland's economy (MMA 2009), thus allowing for a comparison of data.

Cumulative impacts

In addition to the Project, there are a number of other major projects planned for the regions within which the Project is situated. It is important to understand how this group of projects will impact the economy as whole.

The cumulative impact modelling captures the impact on the national, state and regional economies if 30 major projects proceed to full operation. These 30 projects have been identified and agreed through consultation with the Department of Infrastructure and Planning in October 2009 for incorporation into the cumulative impact assessments. The projects are located in the regions incorporating the gas fields, pipeline and LNG facility components of the Project.

Table 1.2 Projects used for cumulative impact modelling

- Arrow Energy Gas Field Development
- Australia Pacific LNG Project
- Australian Inland Rail Expressway - Toowoomba to Gladstone Railway
- Boyne Smelters
- Cameby Downs (Coal) Expansion Project
- Central Queensland Gas Pipeline
- Darling Downs Power Station
- Dawson Expansion Project
- East End No. 5 Mine
- Fisherman's Landing Port Expansion
- Gladstone LNG (GLNG)
- Gladstone LNG Project - Fisherman's Landing
- Gladstone Pacific Nickel Refinery
- Gladstone Steel Making Facility
- Gladstone-Fitzroy Pipeline
- Linc Energy Underground Coal Gasification
- Moura Link (government project)
- Nathan Dam and Associated Pipelines (government project)
- Queensland Curtis LNG Project
- Queensland Gas Pipeline Expansion
- Shell Australia LNG Project
- Surat Basin Railway
- Surat to Gladstone Pipeline
- Walloon Coal Seam Gas Field
- Wallumbilla-Darling Downs Power Station Gas Pipeline
- Wandoan Coal Project
- Western Basin Dredging
- Wiggins Island Coal Terminal
- Woori Coal Project
- Yarwun Alumina Refinery

As with the operational scenario for the Project, the CGE MM600+ model was used to assess the economy wide cumulative impact of all 30 projects identified. Due to the specific geographical nature of the projects, these impacts were then also examined at a state and regional level. Data for other projects came from the respective project proponent's website and publicly released information such their EISs. Data on total Australian production was sourced from the Australian Bureau of Agricultural and Resource Economics.

1.2.3 Estimating the impact on property values

In addition to modelling the expected direct and indirect impacts of the Project on the economy, the potential impact of the Project to property values at a local level have also been assessed.

The impact to property values has been estimated by combining quantitative analysis and qualitative discussion. Due to fluxes inherent in the property industry as a result of factors such as zoning laws and national and international impacts such as the global financial crisis (GFC), this analysis provides an indicative estimate of the proposed changes to property values over the long term rather than a definitive answer.

The potential impact of the Project during the construction has been estimated through a qualitative analysis of factors impacting demand and supply of housing in the region. The analysis takes into consideration the estimated size of the construction workforce who will move into the LNG facility

study area as a result of the Project and the extent to which the housing market can absorb the increased population.

Quantitative modelling of the Project's impacts on the Gladstone property market is based on the long run operational phase of the Project. This approach uses the four-step process described below:

- Identify a major project, similar in nature and location
- Gather historic data on population and property values (over the period in which the similar project commenced operation)
- Calculate a price impact ratio based on information about the similar project
- Use price impact ratio in conjunction with specific project employment data to calculate the impact on property values.

Using the impact of a previous similar project provides an estimate of the impact on property values that focuses on the Gladstone area. This means that region specific influences are accounted for. Also, by using average house price data, this method accounts for supply and demand factors in the region.

This method ensures that outer region bias does not influence the modelling results. Outer region bias would be introduced if impacts in other regions were used as a proxy for estimating the impact of the Project. To ensure this bias is avoided, data is exclusively taken from the Gladstone region to estimate the property value changes in the Gladstone region. For this study area, the Rio Tinto Alcan Yarwun Alumina Refinery (Yarwun refinery) has been used as a benchmark to assess the impact the Project could have on Gladstone property prices.

1.3 Existing economic environment

Gladstone is a major regional centre of approximately 51,800 people[1] (Office of Economic and Statistical Research (OESR) 2009) located in the Central Queensland area. Rockhampton to the north is the hub of the Fitzroy statistical division (the regional statistical boundary as defined by the ABS which incorporates the study area), with Gladstone forming the second major community in the region. The economy of the Fitzroy region is dominated by mining (particularly coal), agriculture (beef cattle, cropping, cotton and horticulture), and minerals processing. Gladstone is a major industrial centre for minerals processing, transport (port and rail) and power generation. Since the early 2000's, substantial investment in mineral processing coupled with increases in coal production in the Bowen Basin has generated improvements in employment and economic conditions in Gladstone and the Fitzroy region more generally.

This section provides a summary of the existing economic environment within which the LNG facility is located, including an overview of the regional and state economies and description of the local Gladstone economy with respect to labour force, infrastructure, key industries and property values.

1.3.1 Regional and Queensland economic overview

The Queensland Office of Economic and Statistical Research (OESR) (2008) estimated that in 2005-06, Queensland's gross state product (GSP) totalled A$184.0 billion (Table 1.3) and recorded average annual growth of 9.9% over the five years to 2005-06. The average annual growth of the rest of Australia during the same period was 6.4% with gross rest of Australia product of A$783.5 billion.

[1] Estimated residential population of Gladstone Regional Council area as at June 30 2008

The four regions making up southeast Queensland accounted for A$114.7 billion in 2005-06, representing 62.3% of Queensland's total GSP. The Mackay and Fitzroy were the only regional areas of Queensland to increase their share of GSP over the five years to 2005-06, largely driven by developments in the mining industry. The Mackay region had the highest rate of growth in gross regional product (GRP) with an average annual growth rate of 18.9%, followed by Fitzroy (which incorporates the Gladstone economy) which had an average annual growth rate of 12.3%.

Table 1.3 Nominal gross regional product, Queensland

Region	2000-01	2005-06	Average annual growth
	$m	$m	Per cent
Brisbane	54,617	85,317	9.3
Gold Coast	na	18,340	na
Sunshine Coast	na	9,375	na
West Moreton	na	1,642	na
Moreton(a)	17,410.0	29,357	11.0
South East Queensland	*72,027*	*114,674*	9.7
Wide Bay-Burnett	5,380	7,815	7.8
Darling Downs	6,124	9,119	8.3
South West	1,342	1,663	4.4
Fitzroy	7,913	14,126	12.3
Central West	629	557	-2.4
Mackay	5,773	13,698	18.9
Northern	5,800	8,557	8.1
Far North	6,566	9,055	6.6
North West	3,130	4,719	8.6
Total Queensland	**114,684**	**183,983**	**9.9**
Rest of Australia	574,579	783,471	6.4

(a) In 2005-06 Moreton is the sum of Gold Coast, Sunshine Coast and West Moreton
na not available

Source: OESR (2008)

Industry composition

Table 1.4 details the industry composition of the Fitzroy statistic division (SD) economy based on 2005-06 price estimates of Gross Value Added (GVA). GVA measures the contribution to the economy of each individual producer, industry or sector. Mining (which includes LNG production) is the most prominent industry in the Fitzroy SD at 39.3% of nominal GVA in 2005-06, up 18.0% from 2000-01. It is important to note that LNG production is defined in both the ABS input output tables and the ANZSIC industry definitions as mining output. Manufacturing, at 10.2% and construction, at 6.8% were the next largest contributors to the Fitzroy regional economy.

The largest changes in composition after mining were observed in agriculture, forestry and fishing (down 3.8%) and electricity, gas and water (down 3.7%) from 2000-01. Construction recorded a strong rise in its share of nominal GVA, up 1.5 percentage points on 2000-01.

The Fitzroy SD recorded an average annual growth in real GRP[2] of 3.2% between 2000-01 and 2005-06. With the exception of the agriculture, forestry and fishing, and electricity, gas and water

[2] Real GRP is calculated net of any inflationary impacts on price levels.

industries, both of which detracted from growth, all other industries in the Fitzroy SD recorded contributions to regional growth (OESR 2008).

The fastest growth over the period was evident in the construction industry followed by finance and insurance and property and business services which also experienced high average annual growth. The mining (resource sector) and manufacturing industries (the largest contributors to the economy) also experienced reasonable growth during the period.

Agriculture, forestry and fishing contracted with an average annual decline of 6.7% over the period. Adverse conditions such as droughts contributed to this decline in production. The decline in electricity, gas and water came after increases in coal prices and a decrease in the pool price of electricity over the period.

Table 1.4 Composition of gross value added, Fitzroy SD

Fitzroy	Composition		Change in Composition
	2000-01	2005-06	
	Per cent	Per cent	Percentage points
Agriculture, forestry and fishing	7.4	3.6	-3.8
Mining	21.3	39.3	18.0
Manufacturing	13.0	10.2	-2.8
Electricity, gas and water	9.6	5.9	-3.7
Construction	5.3	6.8	1.5
Wholesale trade	4.1	2.7	-1.4
Retail trade	5.4	4.2	-1.2
Accommodation, cafes and restaurants	2.3	1.7	-0.6
Transport and storage	5.6	4.8	-0.8
Communication services	1.5	0.9	-0.6
Finance and insurance	2.2	2.0	-0.2
Property and business services	5.1	4.3	-0.8
Government administration and defence	2.2	1.9	-0.3
Education	4.2	3.2	-1.0
Health and community services	3.9	3.1	-0.8
Cultural and recreational services	0.5	0.4	-0.1
Personal and other services	1.6	1.2	-0.4
Ownership of dwellings	5.0	3.9	-1.1
Gross Value Added	**100.0**	**100.0**	

Source: OESR (2008)

Input costs faced by industry

To determine the major input costs faced by industry, three areas were considered, namely:

- Changes in labour costs since the 2006 Census of Population and Housing
- Changes in construction costs in the past ten years in Queensland and Australia, for both building construction and non building construction
- Changes in living costs, in terms of the regional price index.

These changes are determined through analysis of price indices. Price indices such as the labour price index enable prices for a common item or group of items to be compared at different points in time.

With the exception of the regional price index, most data is not available at a local level. Therefore, much of the analysis relates to data at state and national levels.

Labour price index

Since the 2006 Census of Population & Housing, Queensland's labour price index (excluding bonuses) grew by 4.3% per annum, compared to 4.1% per annum for the national average (Table 1.5).

Table 1.5 Labour price index for total hourly rates of pay (excluding bonuses), Queensland and Australia

	Queensland		Australia	
	Index	**Annual growth %**	**Index**	**Annual growth %**
2005-06	108.4	N/A	108.1	N/A
2006-07	113.3	4.5%	112.4	4.0%
2007-08	118.1	4.2%	117.1	4.2%
2008-09	123.0	4.1%	121.8	4.0%
Average, 2006-07 to 2008-09	N/A	4.3%	N/A	4.1%

Note: 2003-04=100; Source: ABS (2009a)

Key industries identified in the LNG facility study area include:

- Manufacturing
- Construction
- Mining (including LNG production)
- Retail trade.

The labour price index is available for all above listed industries at the national level.

The average annual growth rate in total hourly rates of pay (excluding bonuses) was highest for the mining and construction sectors (Table 1.6). Growth in total hourly rates of pay in the manufacturing and retail trade sectors has fallen below the average for all sectors since the 2006 Census.

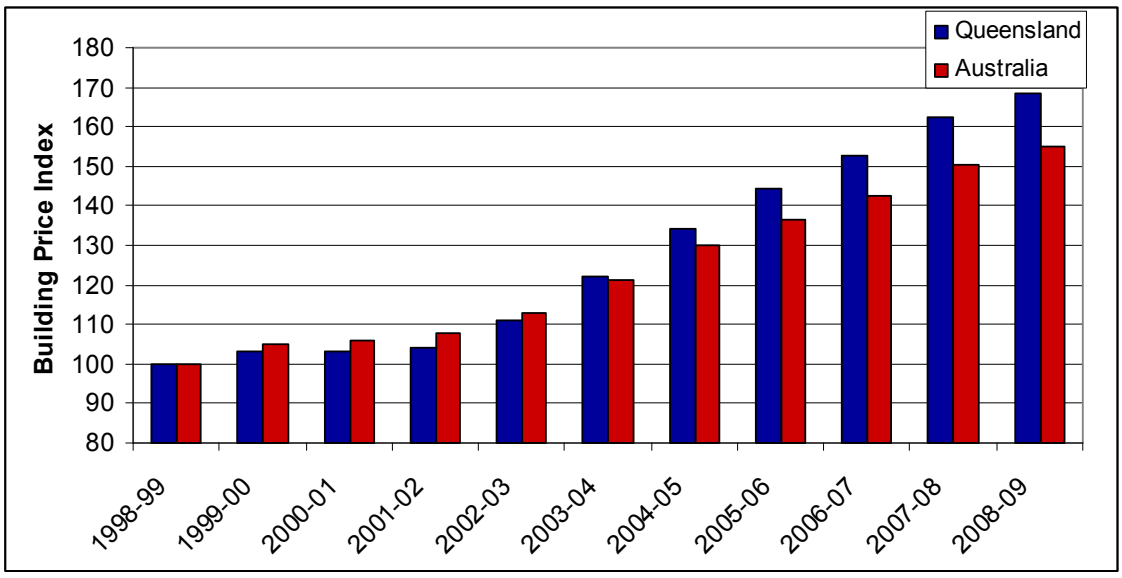
Table 1.6 Labour price index, total hourly rates of pay (excluding bonuses) by industry sector, Australia

	Construction	Mining	Manufacturing	Retail trade	Average
2005-06	110.3	109.2	107.7	107.2	108.1
2006-07	115.5	115.9	111.7	110.3	112.4
2007-08	120.8	122.6	116.6	115.0	117.1
2008-09	126.2	129.3	120.7	119.3	121.8
2006-07	4.7%	6.1%	3.7%	2.9%	4.0%
2007-08	4.6%	5.8%	4.4%	4.3%	4.2%
2008-09	4.5%	5.5%	3.5%	3.7%	4.0%
Average, 2006-07 to 2008-09	4.6%	5.8%	3.9%	3.6%	4.1%

Note: 2003-04=100; Source: ABS (2009a)

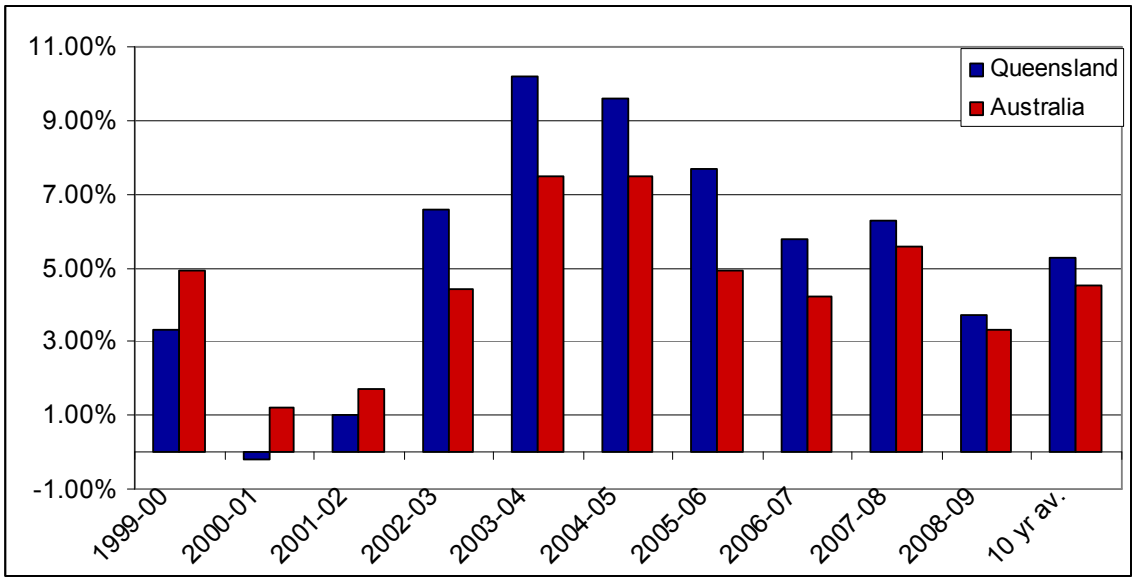
Building price index

Building price indices for general construction in Queensland and Australia are shown in Figure 1.2. Other than in 2000-01, price indices rose in Queensland throughout the 1998-99 to 2008-09 period. Their average growth exceeded the national average, because of stronger growth since 2002-03. This is illustrated in Figure 1.3



Note: 1998-99=100; Source: ABS (2009b)

Figure 1.2 Building price index - general construction industry, Queensland and Australia



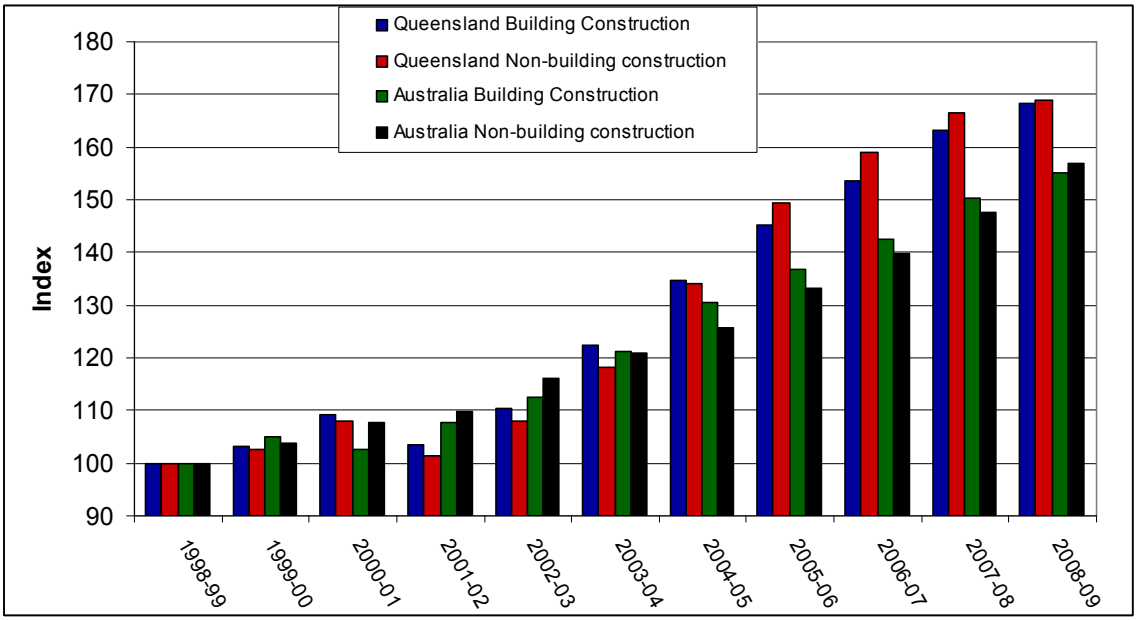
Source: ABS (2009b)

Figure 1.3 Annual change to building price index – general construction

Building price indices for the building and non-building construction[3] sectors are shown in **Figure 1.4**.

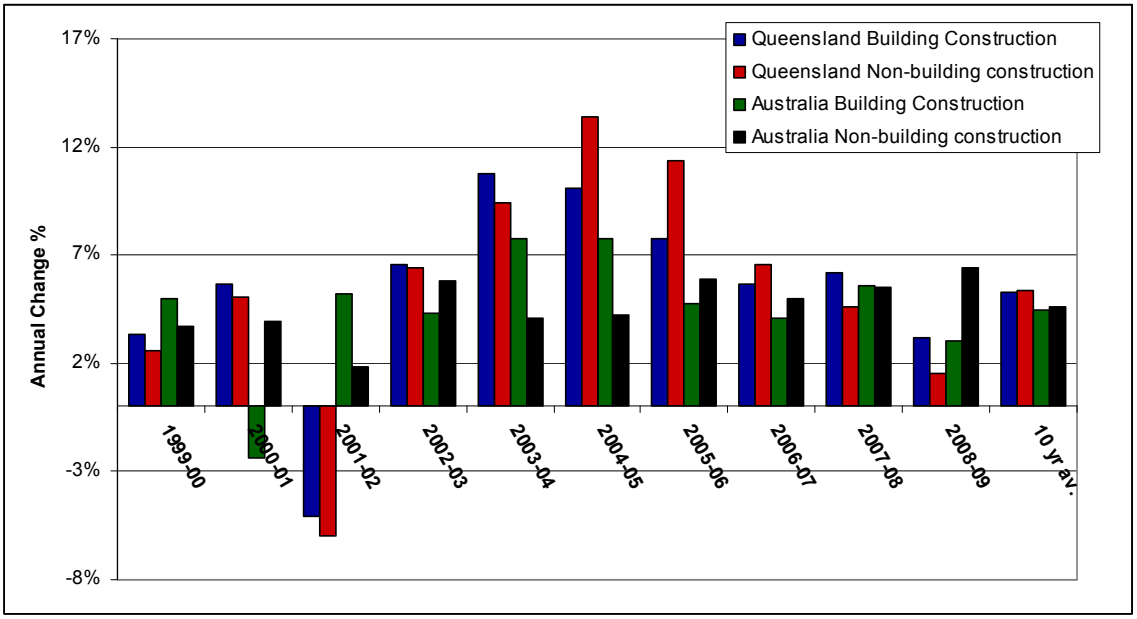
In the case of Queensland and Australia, the indices for non-building construction grew by average rates which were comparable with those for building construction. The average of all indices exceeded average inflation at 3.4% per annum in Queensland and 3.2% per annum nationally across this period which is illustrated in Figure 1.5.

[3] This refers to construction of engineering projects or infrastructure such as: railways, dams, irrigation systems, harbour or river works, water or gas supply systems, oil refineries (except buildings), pipelines or construction projects in the on-site assembly of boilers, furnaces or heavy electrical machinery from prefabricated components, or in the general repair of such structures, machinery or equipment.



Note: 1998-99=100; Source: ABS (2009b)

Figure 1.4 Building price index - building construction and non-building construction sectors, Queensland and Australia



Source: ABS (2009b)

Figure 1.5 Average percentage change in the building price index - building construction and non-building construction sectors, Queensland and Australia

All industry sectors have recorded wage increases since the 2006 Census of Population and Housing, with wage growth in the construction and mining sectors exceeding the national average. ABS data also indicates that wage increases are likely to have been higher in Queensland than Australia.

Construction costs in Queensland and Australia have generally increased year on year above the rate of inflation over the past ten years. Since 2002-03, the growth in construction costs in Queensland has exceeded the national average.

Regional price index

Relativities can be gauged by comparing regional price indices across centres in the study area and the Brisbane index in each case. The statistics show that the costs of living in the study area compared to Brisbane vary across categories. Based on the 'all items' index, costs were lower in Gladstone than in Brisbane (Table 1.7).

When housing costs are excluded from the index, costs are broadly comparable with those for the Brisbane index. Whilst housing is significantly lower in Gladstone than Brisbane, it is important to note that the data relates to 2006 figures, and Gladstone has experienced significant increases in house prices since that time. Food, recreation and health, education and communication were all higher than Brisbane with the food category having the highest price index (107.9).

Table 1.7 Regional price index, May 2006

Category	Gladstone	Brisbane
Food	107.9	100.0
Alcohol and tobacco	97.6	100.0
Clothing and footwear	94.4	100.0
Housing	83.0	100.0
Household contents and services	95.4	100.0
Health, education and communication	100.4	100.0
Transportation	96.8	100.0
Recreation	100.2	100.0
Financial and insurance services	95.6	100.0
All items	95.8	100.0
All items less housing	99.3	100.0

Source: OESR (2006)

1.3.2 Local economic overview

Labour market

Information regarding the labour market is able to be assessed using data at the statistical local area level, which provides information more specific to particular areas in the LNG facility study area than the statistical division data. Data from the 2006 Census reveals that 21,481 people were in the workforce in the Gladstone Regional Council area. The total population of the Gladstone regional area at the 2006 Census was 50,752 people, with 34,311 people aged between 15 and 64. Comparing the workforce size against the population aged between 15 and 64 years indicates that the workforce participation rate is approximately 62.6%. This is marginally lower than the Queensland participation rate of 66.3%, suggesting that there may be some opportunity for the Project to source some of the

required workforce from the local population who are not currently employed or looking for work, given the training and capacity building initiatives outlined in the social impact management plan. Those members of the community often not in the workforce include mothers with young children, people with a disability and early retirees.

Analysis of the distribution of employment across industries show that the Gladstone region (particularly Gladstone SLA and Calliope Pt A SLA) has more than double the state average of employment in the manufacturing sector, as well as higher than average employment in the services, construction, accommodation and transport sectors. This matches closely with the role that Gladstone plays as a major industrial centre.

Unemployment in the Gladstone region has risen slightly from March 2008 to March 2009, particularly in comparison to Queensland trends. While the state average for unemployment rose just 0.4% over this period, the rate in the Gladstone SLA increased by 1.1% from 3.2% to 4.3%. This was lower than the corresponding unemployment rates in the Rockhampton region of 4.4% to 6.7% in the same period. Calliope Pt B SLA, a largely rural area, experienced a larger proportionate increase in unemployment than Gladstone, however numerically it equated to an increase of just 22 persons.

Key industries

The Gladstone regional area supports a number of key industries in refining, minerals processing, chemicals and mining. Major industries within the region include:

- Queensland Alumina Limited – major aluminium refinery, commenced in 1964
- Cement Australia – major cement manufacturer, commenced in 1981
- Boyne Smelter Limited – major aluminium smelter, commenced in 1982
- Orica – major chemical manufacturer, commenced in 1990
- Rio Tinto Alcan Yarwun Refinery – major alumina refinery, commenced in 2002.

There has also been a trial to refine oil shale with the Stuart Oil Shale Project, an approval to build the Aldoga Aluminium Smelter that has not yet been taken up, and a more recent (2009) approval to build the Gladstone Pacific Nickel Refinery. The latter project has been delayed following the global financial crisis in 2008-09.

The development of the Rio Tinto Alcan Yarwun Refinery from 2002 (Stage 1 followed by Stage 2) as well as other industrial developments over the same time period has generated substantial growth in the local and regional economy. The contribution of infrastructure and industry to the economy can also be seen through the operations of the Gladstone Port. This is the largest multi-commodity port in Queensland, and handled a record 76.48 million tonnes of cargo in 2007-08. There has been a significant increase in total throughput at the Gladstone Port over the previous five years, with a 28.2% increase from 59.66 million tonnes in 2003-04 (Queensland Transport 2008). A total of 1,368 ships visited the port in 2007-08.

ABS data from 2007 shows that there were 2,277 sole traders and 1,746 businesses in the Gladstone Regional Council area which employed labour in 2007. The majority of sole traders were in the agricultural, construction and property and business service sectors. Of those businesses employing

staff, 210 were employing 20 or more employees[4]. The industry sector with the greatest number of businesses was the construction industry, followed by the property and business services sector.

There are a large variety of major industrial developments proposed or planned for the Gladstone region over the next five years. The cumulative impacts of these projects on the economy, in addition to the impacts that current industries have is expected to be significant. Whilst the projects are expected to have a positive cumulative impact on national GDP and contribute significantly to the state and regional economies, they are also expected to place greater pressure on property prices and skills shortages. The cumulative impact of proposed projects is assessed in Sections 1.4.3 and 1.4.4).

Key infrastructure

Gladstone has major competitive advantages because of its geographical features (deep water port, coastal features), infrastructure (transport, power, water and other facilities) and location (proximity to major mining areas). Key infrastructure relevant to the Project and the existing economic environment can be assessed in six categories: natural assets, transport infrastructure, energy infrastructure, water infrastructure, industrial land and social infrastructure. Details of the study area's infrastructure assets are provided below.

- Natural capital – a deep water port and proximity to rich mineral reserves has helped Gladstone develop as a key coal export terminal
- Transport infrastructure – the key elements of transport infrastructure which contribute to Gladstone's competitive advantage are the infrastructure related to the port facilities; the railway hub facilities providing access to Brisbane, Rockhampton and the Bowen Basin; the road network; and the regional airport with daily connections to Brisbane, Rockhampton, Mackay, Townsville and Cairns
- Energy infrastructure - there are three major power stations within 100km of Gladstone at Gladstone, Stanwell and Callide. This access to energy has underpinned the development of the minerals processing sector
- Water infrastructure - water supplies for industrial and urban consumption is accessed from the Awoonga Dam through the Gladstone Area Water Board. A proposed pipeline from the Fitzroy River at Rockhampton to Gladstone is currently awaiting approval and would further guarantee the community's water supply
- Industrial land – to ensure sufficient industrial land is available for Gladstone's future industrial development, the State Government has, since 1993 set aside land as a State Development Area. The size of the site was increased in 1997, 2001, 2002 and 2008 and now includes 28,000 hectares of industrial land. The most recent addition was the incorporation of land on the south west coast of Curtis Island which is the proposed site of the Project
- Social infrastructure – the presence of quality and diverse cultural, community and recreation facilities and/or organisations is vital to the social health of communities. It plays an important role in the quality of life for residents, and in building a vibrant and strong community. As a regional centre, Gladstone provides a range of social infrastructure to its residents including schools, a hospital, entertainment centre and community and arts centres.

[4] The data may not include some of the major minerals processing industries as these businesses are registered for GST purposes in different cities.

Relevant government policies and strategies

The Queensland Government, local councils, and government agencies have been active in planning for the expected growth in the Gladstone region associated with the development of the LNG industry over the next decade. The various government bodies and state agencies have either recently produced, or are in the process of developing, a number of plans and strategic frameworks to ensure that the development potential of the region is enhanced whilst reducing the negative impacts on the community. The strategies have been developed to ensure the Gladstone region has the appropriate infrastructure, facilities and services in place to underpin and facilitate development. Details of these are provided below.

- The Queensland Government's Blueprint for Queensland's LNG Industry, which details how the Government will further work with the industry and local communities to ensure that development of an LNG industry is progressed in a way that benefits all Queenslanders
- The sustainable resource communities policy, published by the Queensland Government, outlines the moves the Government is making to strengthen its coordination role, improve the linkages between social impact assessment and strategic regional planning, facilitate partnerships with local government, industry and community, and enhancing the regulatory framework for social impact assessment
- The Coordinator-General's Draft Port of Gladstone Western Basin Master Plan, which provides a strategic plan that considers the future development opportunities for the Port of Gladstone Western Basin and the implementation mechanisms required to achieve an efficient and coordinated development of the asset. This master plan identifies options which include alternative transport corridors, an integrated rail system to Hamilton Point, road or bridge access from Gladstone to Curtis Island, and potential expansion of the port facilities through duplication of the outer channel
- Major projects housing policy which is currently in development, and which is expected to detail strategies to improve the availability and supply of housing to support major projects and guide investment in the provision of housing
- Gladstone Regional Council's corporate plan 2009-13 which identifies the Council's commitment to develop an integrated regional plan in consultation with the community, business, industry and Government so as to achieve its goal of ensuring that its planning is strategic and regionally aligned, and that facilitates well managed growth and a diverse range of development options
- Gladstone Region Sustainable Infrastructure Strategic Plan (SISP), currently in development, which is expected to recommend mitigation measure to address cumulative impacts of major projects. The SISP is being developed as a collaborative effort between the Department of Infrastructure and Planning, Gladstone Regional Council and the Gladstone Economic and Industry Development Board
- Proposed Fisherman's Landing port expansion, which has been put forward as an option by Gladstone Ports Corporation and involves the northern expansion of the existing Fisherman's Landing facility through the reclamation of additional land adjacent to the existing port facility. The reclamation will provide additional land for the construction of six wharves and provide an area for the development of transport, storage, loading and unloading facilities and will be filled using dredged material.

Property values

Large projects can create significant demands for land for industrial and housing purposes. Projects that stimulate higher levels of demand through upstream and downstream supply chains are likely to have larger impacts on demands for industrial land, while projects that attract more population through direct, indirect and induced employment effects are likely to have more impacts on housing markets. These types of impacts can be minor in larger centres where there are ample stocks and development to cater for growth, but have the potential for more impact in regional centres such as Gladstone where land and dwelling stocks and changes in property stocks tend to be relatively smaller.

Industrial land

The stocks of industrial land can be classified into two broad groups. The first cater for the major projects where large areas of land are required for industrial plants and associated buffer purposes. The Gladstone State Development Area caters for these needs, and with 28,000 hectares of land available, most future projects have the potential to be accommodated.

The second group of industrial land supplies cater for the smaller industrial firms that are involved in upstream and downstream supply chains to industry, and to the commercial sector. Herron Todd White (2008) identified that the market for industrial premises in Gladstone had peaked by December 2008, with an oversupply of available property relative to demand.

Currently most of the industrial land for this group is in the sub - A$3 million range and current stocks of available industrial land that is well located is limited (Herron Todd White 2009). Herron Todd White (2009) identify that prices range from around A$1,250/m² for smaller industrial sites of around 2,000 m² with a shed of around 500m² to approximately A$1,750/m² for small strata title properties of 100 – 300m². The market for industrial land has been very quiet in 2009 due to changes in global market conditions, with some smaller sheds vacant. The retail market is also quiet, with very few sales in 2009 and subdued leasing activity.

Herron Todd White (2009) identify that the effects of new industrial development is most likely to be concentrated on the larger industrial sector for activities such as warehousing and fabrication. The preferred industrial areas in the market appear to be Hanson Road, Callemondah and Clinton.

Residential housing market

The Central Queensland property market has been extremely strong for the past few years, experiencing significant increases in median prices for units, houses and vacant lots. According to the Real Estate Institute Queensland, prior to the GFC, Gladstone had been experiencing a house price boom, fuelled by its diversity of industries. The boom was also attributed to its proximity to the Great Barrier Reef and coastal towns such as Tannum Sands as well as initiatives such as the first home owners grant and the strength of the national and local economy. However, as shown in the table below, the GFC has impacted negatively on house and unit prices within the Project area, with all localities experiencing a negative growth rate in the 12 months to October 2009. Between July and October 2009, the market has remained relatively stagnant, with some small gains in Boyne Island and Tannum Sands and marginal decline in house prices for Calliope and Gladstone City. This is in contrast to the average annual growth rate for the past 10 years which has been more than 10% for all localities.

Table 1.8 provides information based on October 2009 data for median house and unit prices as well as average growth rates for the key urban localities in the study area.

Table 1.8 Median house price, Gladstone region October 2009

	Median house price		
Urban locality	**Median price to October 2009**	**12 month growth to October 2009 (%)**	**Annual average growth (last 10 years) (%)**
Gladstone City	355,000	-2.7	13.5
Boyne Island	390,000	- 10.1	13.4
Tannum Sands	445,000	-6.8	12.4
Calliope	383,000	-3.4	17.3

Source: RP Data (2009)

In contrast to house prices, the rental market in Gladstone has experienced strong growth from September 2007 to September 2009 with the median rent for three bedroom housing increasing from A$260/week to A$300/week (15% increase) and four bedroom houses increasing from A$290/week to A$350/week (21% increase). These increases are comparable to the increases experienced in Brisbane for the same period (14% and 16% respectively), although the increase in four bedroom weekly rental was greater, The prices paid per week for rental units also increased considerably for units, with both 1 bedroom and 2 bedroom units increasing in price by 24% over the period. The period from September 2008 to September 2009 was somewhat flatter, with prices remaining relatively stable which is in line with national trends of just 2% rental growth between 2008 and 2009 in comparison to 12% the two years prior.

Table 1.9 presents the median weekly rents paid for private accommodation in the Gladstone Regional Council area from June 2007 to June 2009.

Table 1.9 Median weekly rents, Gladstone area

	Type of housing	**Median weekly rent September 2007**	**Median weekly rent September 2008**	**Median weekly rent September 2009**	**% Change 07-09**
Gladstone area (including Boyne Island and Tannum Sands)	4 bedroom house	A$290	A$370	A$350	21%
	3 bedroom house	A$260	A$300	A$300	15%
	3 bedroom unit	A$260	A$290	A$290	12%
	2 bedroom unit	A$190	A$230	A$235	24%
	1 bedroom unit	A$170	A$190	A$210	24%

Source: Queensland Rental Tenancy Authority (2009)

Land supply is a key factor in housing affordability as a low level of available land can place significant pressure on a housing market which is experiencing high level of demand. In Gladstone, the amount of vacant land approved for residential development is quite high. Gladstone Regional Council approved 1,475 residential lots in the year to December quarter 2008, which was an increase of 104.9 percent compared with the same period in the year prior when 720 lots were approved. This high level of land availability may assist containing the impact major projects have on house prices in the long

term. Given the long period between land approval and an occupied dwelling, it is essential that the Council and property developers are aware of the anticipated population increase associated with the Project during both the construction and operational phases.

1.4 Economic impact assessment

This section provides a detailed discussion of the assessment of potential economic impacts during the construction and operational phases of the Project. Impacts are discussed for each of the economic impact categories, including for cumulative effects resulting from other development projects. Mitigation measure for the identified economic impacts can be found in the social impact assessment in Volume 4 Chapter 20.

1.4.1 Identification of potential economic impact categories

Economic impacts have been classified according to the categories presented in Table 1.10. Each of the impact categories are explained in the context of potential implications of the Project on the economic environment.

Table 1.10 Impact categories

Impact category	Implication to economic environment
Economy wide impacts	
Project significance	The Project has the potential to contribute significantly to the economy through increasing regional, state and national gross product and employment
Factor incomes	Implications for increases in wages at the national level and attract increased investment to Australia
Use of local goods and services	Contribution to the economy through use of local goods and services rather than imports
Standard of living	Implications for improved standard of living as a result of improved access to non-essential goods and services
Local and regional level impacts	
Income and affordability	Potential upward pressure on the price of property (residential and commercial), increased pressures on cost of goods and services in the short to medium term and increased demand on infrastructure
Employment and training	Implications for employment and training opportunities associated with increased economic diversification and increased jobs
Business and Industry	Increased opportunities for local businesses, implications for business employment and the capacity of businesses to retain workers. Implications associated with changes to land use and increases in dust, noise and transport
Cumulative Impacts	
Economic contribution	The development of multiple projects in the study area has the potential to contribute significantly to the economy through increasing regional, state and national gross product and employment
Compound Impact	The cumulative project scenario has the potential to compound the income and affordability, business and industry and employment and training impacts that result from the Project

Potential economic impacts were identified through a phased approach. The first phase involved a desktop investigation of the baseline assessment findings, analysis of stakeholder consultation outcomes and review of relevant studies. The second phase involved the modelling of economic impacts using the methodology detailed earlier in the chapter. The outcome of this was used to identify any further impacts which may come about as a result of changes to the economy.

1.4.2 Economy wide impact

This section details the economy wide impact of the Project and the cumulative impact of projects planned for the region within which the Project will operate. The modelling takes into consideration the impact of the whole Project, from extraction of CSG in the gas fields to processing of the LNG at the LNG plant. This acknowledges the relationship between the three components. This is a summary of

the estimated contribution of the Project to the economy. A more detailed analysis and discussion is provided in Volume 5 Attachment 44.

Project significance

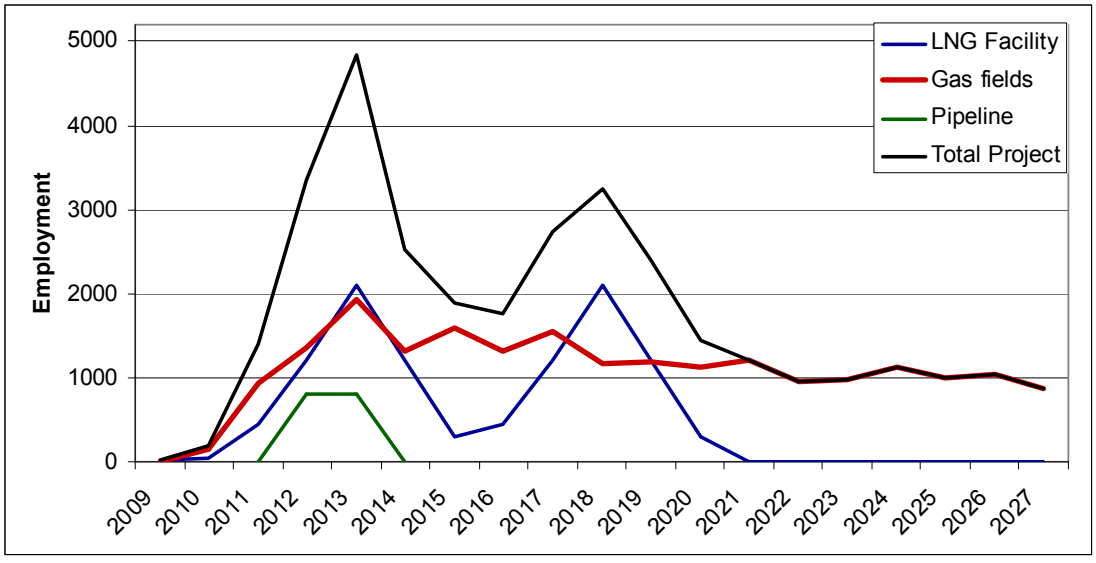
A project of the size of the Australia Pacific LNG project can be expected to have significant impacts on the local, regional, state and national economies. The Project represents a significant investment in value adding to CSG resources, and will create a new export industry in Queensland, diversifying the state's economic base. The Project is important because it will contribute to the economy in a range of ways as outlined below.

- It will generate significant export income, which will flow through to local, regional, state and national economies. Royalties and taxes will make a significant contribution to government income, while other income will flow into the business and private sector
- It will increase expenditure, and stimulate the economy with benefits flowing through the supply chain supporting the Project helping to underpin the construction, business and professional services sectors of the economy, particularly at the local and regional levels
- It will increase employment, both through direct employment, and indirectly through jobs created in the supply chain supporting the Project. The increased employment will lead to demographic impacts, with increased net population migration to regional and state areas as a consequence.

A summary of the construction and operational scenario impacts of the Project on the regional, state and national economies is outlined below.

Construction scenario impact

Figure 1.6 shows the direct employment associated with the three components of the Project during the construction phase.

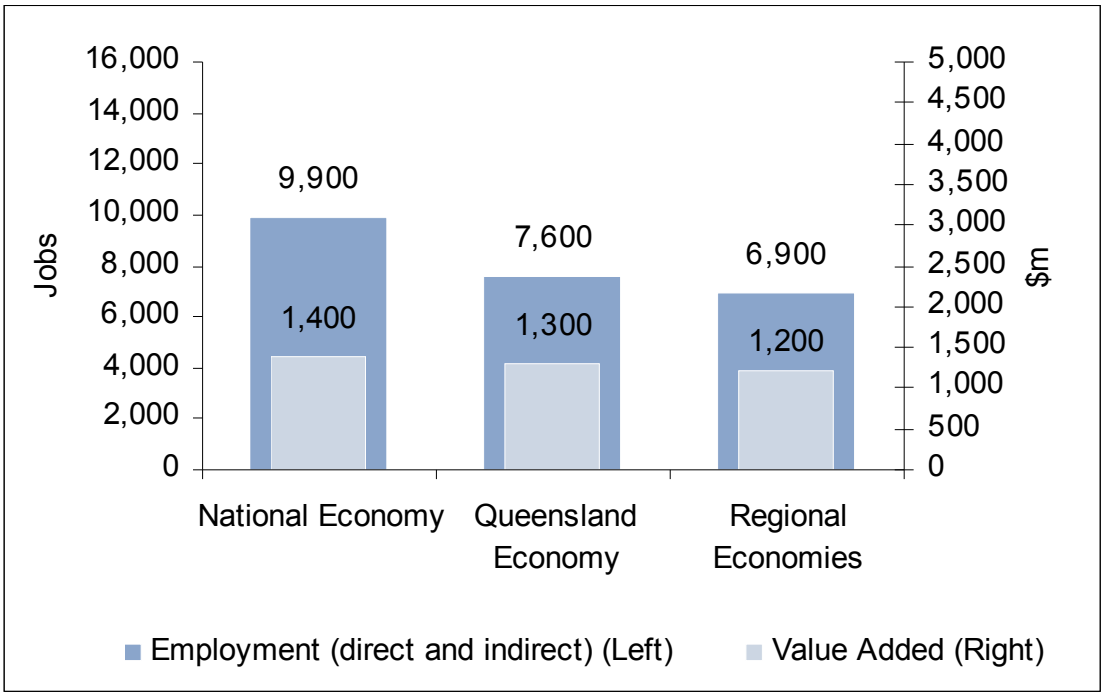


Source: Australia Pacific LNG

Figure 1.6 Project construction workforce 2009-2027 (direct only)

The indirect effects are due to the additional demand for goods and services that the Project's construction sites and construction workers will stimulate. Overall, during the construction of the Project, activity across the economy is expected to be higher than it would have been without the

Project. Figure 1.7 shows how the construction of the Project would (directly and indirectly) contribute to the economy.



Source: KPMG Econtech (2010)

Figure 1.7 Average economic impacts of the construction phase of the Project

Of the estimated A$1.2 billion contribution to value added in the regional economies, approximately two-thirds, or A$800 million is expected to be realised in the Mackay-Fitzroy-Central West region and A$400 million in the Darling Downs-South West Queensland region.

The construction industry is expected to be the key beneficiary of the Project. The construction scenario of the Project is expected to directly contribute an average of approximately A$1.02 billion annually to construction industry value added in Australia. Value added refers to the contribution to the economy of each individual producer, industry or sector.

This is equivalent to boosting the contribution of the industry to the economy above what it would have been without the Project, by:

- 1.2% in the national construction industry
- 5.0% in the Queensland construction industry
- 33.6% in the construction industry of the combined regional economies of Mackay-Fitzroy-Central West and Darling Downs-South West.

The additional annual value added will be divided between increased profits for the construction companies and wage payments to the additional construction industry workers in each of the geographical areas being considered.

In addition to directly increasing the construction industry value added, the construction of the Project is expected to also indirectly impact on the value added of other industries. This reflects the stimulus to the construction industry supply chain and consumer spending by additional construction industry workers.

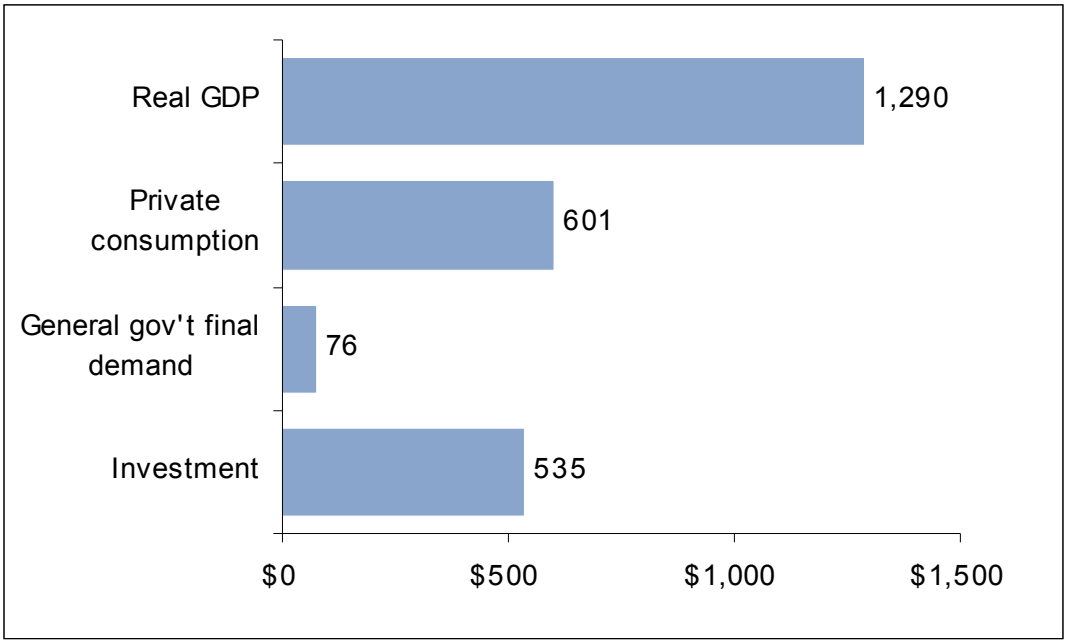
Operational scenario impact

The Project is expected to impact the Australian economy both directly and indirectly once it is fully operational. The results presented below focus on the long-term effects of the change (after the economy has fully responded). This allows the Project to be assessed against its overall impact on the economy and not just the direct effects in the first few years. Thus, the operational impacts presented here are an estimate of the average annual impacts the Project will have on the economy over the life of the Project.

At the national level, real gross domestic product (GDP) is expected to be approximately A$1.3 billion higher annually than it would have been without the Project. These estimates include both the direct and indirect contribution from increased activity in industries that supply inputs to the Project, and purchase output from the Project.

The expected increase in real GDP will also facilitate higher real national income as a result of the Project. The higher real income would result in both higher consumption and investment. Consumers would adjust to the higher real income by spending more on goods and services, while higher incomes would also enable industries to invest in new capital stock to take advantage of profit opportunities.

This anticipated increase in private consumption and investment is also shown in Figure 1.8. This illustrates that during operation of the Project, private consumption is estimated to be higher by approximately A$600 million on average in each year and annual investment would be approximately A$535 million higher.



Source: KPMG Econtech (2010)

Figure 1.8 Annual operation scenario national macroeconomic effects (A$m in 2006-07 prices)

For industries that are trade-exposed, prices are determined on world markets and the exchange rate plays a vital role in determining activity in those industries. Higher real national income (stemming from the increased activity in the oil and gas production sector) would be expected to lead to a higher value of the Australian dollar. A higher Australian dollar, in turn, lowers demand for other Australian exports. Therefore, the production gains in the consumer-oriented industries and the industries upstream to the oil and gas sector would be somewhat offset by losses in production in other trade-

exposed industries. For example, manufacturing and agriculture are trade-exposed industries. Hence, these industries are expected to experience lower production levels following the appreciation of the Australian dollar. Tourism is another exchange-rate exposed industry. In general, production in tourism-related industries (such as accommodation, cafes and restaurants and transport) is lower than otherwise would be the case. Although there may be a reduction in demand for exports in some industries associated with an appreciating Australian dollar, the overall export impact associated with the Project will be positive.

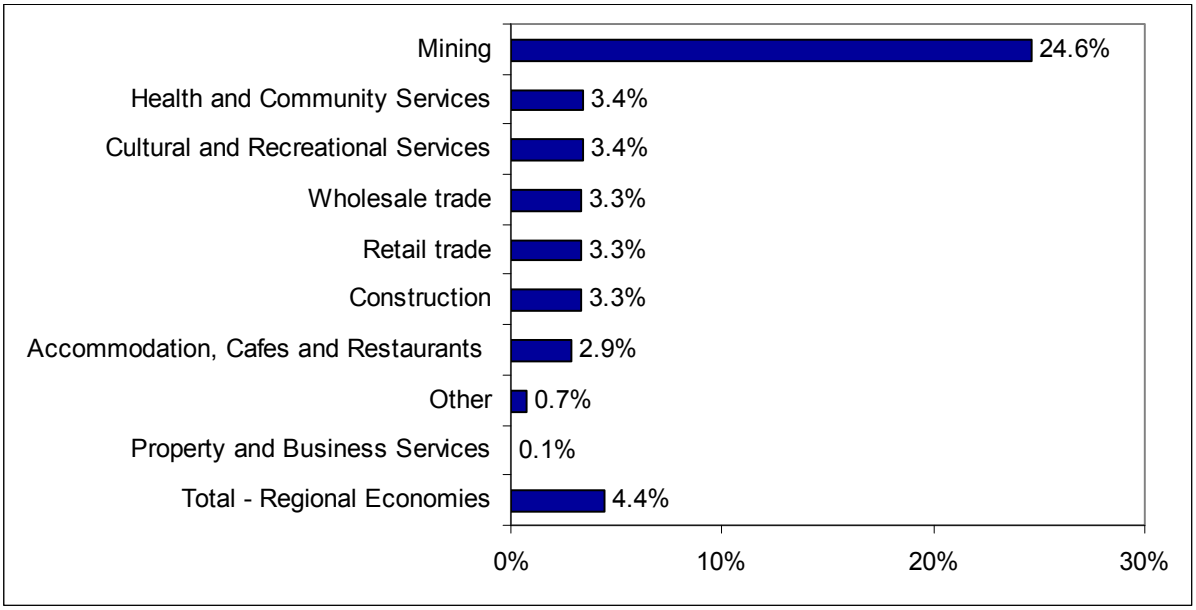
Once the Project is fully operational, it is expected to contribute an increase of A$2 billion in Queensland's GSP on average each year. This is a significant increase and is expected to lead to the creation of an average of 9,000 jobs (directly and indirectly) each year in Queensland, including 5,000 jobs (directly and indirectly) each year in the Queensland resource sector. The contribution to the Queensland economy is greater than for the Australian economy because of the location of the Project in Queensland. This will mean that a higher proportion of inputs (labour, goods and services) would be sourced from within Queensland than elsewhere in Australia.

In addition to contributing to increases in Queensland GSP and employment, the Project will also contribute to Queensland state revenue through royalties and taxes. The Queensland Government has estimated that royalty receipts associated with a 28Mtpa LNG industry would reach A$850 million by 2021(MMA 2009). Using this rationale, at peak production, the Project could generate royalty revenues for the State of up to A$485 million per annum.

The operational phase of the Project is expected to contribute significantly to regional employment and contribute to the local economy through an increase in value added. As outlined earlier, value added measures the contribution to the economy of each individual producer, industry or sector. The Project is expected to lead to:

- An increase in overall value added by A$450 million in the Mackay-Fitzroy-Central West Queensland region and by over A$900 million in the Darling Downs-South West Queensland region annually
- An increase in overall employment (both direct and indirect) of approximately 3,000 jobs in the Mackay-Fitzroy-Central West Queensland region and nearly 6,000 jobs in the Darling Downs-South West Queensland region annually.

Figure 1.9 presents the estimated production effects on the regional economies of Mackay-Fitzroy-Central West and Darling Downs South West in Queensland. It presents the percent increase in industry output contributable to the Project. The project-life impacts presented here are the average annual impacts the Project has on the economy over the life of the Project.



Source: KPMG Econtech (2010)

Figure 1.9 Regional industry production effects during operation (% deviations from baseline)

Figure 1.9 shows the Project is expected to provide positive impacts to the production of most industries in the Mackay-Fitzroy-Central West and Darling Downs South West regions. Specifically, the Project is anticipated to have a significant direct positive contribution to the mining industry (including CSG-LNG)[5]. This will boost revenue in the Mackay-Fitzroy-Central West and Darling Downs South West economies. Higher revenue will then flow through to extra spending in consumer driven industries, such as retail trade, accommodation, café and restaurants, health and community services and cultural and recreational services.

As these figures demonstrate, the Project is anticipated to provide significant economic benefits and make a significant contribution to the Australian economy, as well as the regional economies of the Mackay-Fitzroy-Central West and Darling Downs South West regions.

Use of local and other Australian goods and services

The capital value of the Project is forecast to be approximately A$35 billion (nominal dollars) to be carried out over 10 years of construction between 2009 and 2018. Australia Pacific LNG is committed, to the extent that it is reasonably practicable, to source goods and services locally and elsewhere in the Australian economy for the construction of the Project. For the purposes of the economic modelling, it has been assumed that of the A$35 billion investment, approximately 65% will be sourced from goods and services from Australia. The overseas component (approximately 35%) has not been included in the modelling, as this expenditure does not have an impact on the Australian economy during the construction phase. This anticipated ratio of local versus overseas expenditure may change in line with final project design.

Cost of building materials

The Project has the potential to contribute to an increase in price of building materials due to strong demand particularly in local areas in the short term, potentially reducing the willingness of developers

[5] LNG production is defined in both the ABS input output tables and the ANZSIC industry definitions as mining output.

to build new and upgrade existing residential, commercial and industrial developments in the area, and/or increases in the cost of these developments to the consumer.

Despite this expected short term local increases modelling for this assessment shows that in the long term, at a national level, the Australia Pacific LNG Project is expected to contribute to a 0.3% decline in the consumer price index (CPI) relative to the base case, while the cumulative effect of the projects in the region is expected to contribute a CPI growth rate that is 0.8% lower than in the base case. As a result goods and services are expected to be less expensive in the long term once supply and demand issues at the local and regional level have balanced. This is due to a range of factors including an expected appreciation of the Australian dollar which will lead to lower import costs.

Factor incomes

Wages

In the long run, Australia-wide real after tax wages are estimated to be 0.1 % higher (pre-tax wages are expected to be 0.3% higher) as a result of the Project. This is the overall wage increase across all industries. There is likely to be short-term differences in the wage impact across industries and regions due to varying levels of skills shortages.

This increase is the result of two effects. First, the significant injection of capital generated by the Project will mean that the labour force will be more productive. The increased labour productivity is rewarded with an increase in wages. Second, the Project will generate increased competition in the labour market. The increased competition will be particularly prominent in the Queensland regions that the Project will operate. The increased competition will add to real wage pressures, leading to a rise in real wages.

Gross operating surplus (returns to capital)

In the long run, assuming capital markets return to normal liquidity levels, the Project is anticipated to attract increased investment into Australia. Gas related industries such as the coal, oil and gas industry group, mining group and the basic non-ferrous metal and metal products industry group are set to experience increases in gross operating surplus (GOS) due to the capital injection in those industries, as a result of the Project. In contrast, industries that are not gas-related are expected to experience a small loss in GOS because capital from non-gas industries will be moved away from these industries, into the gas industry for the Project. When all industries are considered, the total impact will be small and positive, with GOS of all industries anticipated to be 0.03 % higher with the Project in operation.

Standard of living

The direct and indirect contribution of the Project to the national economy, the Queensland economy, and the regional economies feeds through to contribute to living standards. Living standards are generally measured by looking at the quality and quantity of goods and services available to people and the way these goods and services are distributed within a population.

The economic modelling undertaken for the Project indicates that the operational phase is anticipated to produce a net annual improvement of A$573 million (2006-07 prices) in consumer living standards above what it would be if the Project does not proceed.

The impact of the Project to household standard of living is derived from changes in non-essential consumption (consumption that is above the level required to survive). Thus, the A$573 million (2006-

07 prices) is the change in total non-essential consumption for all Australian households because of the positive economic contribution of the Project.

The modelling predicts that per capita increase in living standards in Queensland will not be significantly different to the national figure due to assumed flexibility within the model. However, it is acknowledged that in practice, labour does not move as fluidly between states as the model predicts due to a range of social, economic and personal reasons. As such it is anticipated that there might possibly be a small Queensland wage premium to develop due to increased demand for labour within Queensland and a greater number of high skilled jobs which attract higher levels of remuneration, thus increasing disposable income to a greater degree. Therefore it is expected that the level of improvement to standard of living in Queensland will probably exceed the national impact.

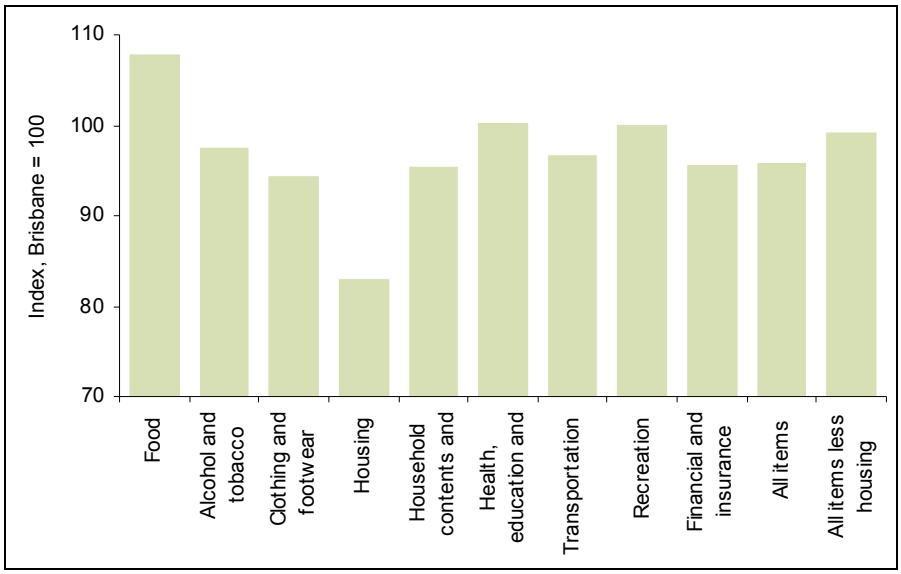
1.4.3 Local and regional impacts

The assessment of the Project on the Gladstone local and regional economies takes into consideration the potential impact of the Project to the LNG facility study area and wider region. This assesses localised impacts associated with the increase in population as a result of the Project as well as other LNG plant specific impacts.

Income and affordability

Cost pressures

In 2006, the all items price index, and all items except housing price index for Gladstone were lower than in Brisbane (Figure 1.10). When the subcategories are analysed, it shows that the prices of food, health, education and communication, and recreation were higher in Gladstone than in Brisbane. All other items were less expensive, with the housing cost price index for Gladstone 17 % lower than in Brisbane in 2006.



Source: OESR (2006)

Figure 1.10 Regional price index for Gladstone, May 2006

At a regional level, the Project has the potential to contribute to a short term increase in both costs to business, in terms of higher wages and input costs, and the cost of living for households due to inflationary pressures from higher wages and increased demand for goods and services in the region. In addition, increased demand for infrastructure and social services may place further upward

pressure on prices in the region, in the short term. The overall impact to cost pressures in the region is likely to be larger when the cumulative effects of the other projects are taken into account, especially given that wages are anticipated to be 0.6% higher nationally as a result of the cumulative impact of multiple projects (see Section 1.4.4 for further information on cumulative impacts).

Property prices

The construction workforce is expected to peak at around 2,100 people required onsite during the concurrent construction of the first two LNG trains between 2012 and 2014 and again for the second two trains between 2017 and 2019. Despite this strong job creation due to the LNG facility, the Project's direct impact on property values during the construction phase is expected to be mitigated to some extent through the provision of a temporary accommodation facility (TAF) located on Curtis Island. The TAF is anticipated to accommodate up to 80% of the construction workforce (approximately 1,700 people at peak construction) and is intended to be relatively self sufficient, so these workers will have limited interaction with the property market of Gladstone.

Of the minimum 20% local workforce (approximately 420 workers), it is anticipated that some will already reside in Gladstone, thus not placing any increased pressure on the housing market. Anecdotal evidence from Gladstone indicates however that some individuals and families may move permanently to Gladstone, or return to Gladstone to take up employment opportunities associated with the Project, therefore not residing in the TAF. Despite extensive research, data qualifying this anecdotal evidence has not been identified and as such, the potential impact of this on house prices has not been quantified. It is likely however that this will result in a direct impact on the housing market in Gladstone. In addition to the direct impact through an increase in population, the Project may also lead to speculative purchasing of properties by investors. These impacts could potentially lead to a rapid increase in demand for housing in Gladstone and place upward pressure on housing prices. It is anticipated that this pressure would begin as a result of speculative purchasing at the beginning of or prior to the construction period, and then increase as the construction workforce moved towards peak size in 2013. It is expected that once the workforce reaches its peak, the impact to house prices associated with the Project would stabilise. This is supported again by anecdotal information sourced through consultation in Gladstone.

In addition to direct impacts, the LNG facility will be a major development in Gladstone and provide many flow-on benefits through stimulation to the local economy. Flow-on benefits, such as indirect job creation, are expected to lead to indirect property price increases throughout the construction phase, while the increase in prices caused by permanent migration will persist into the future.

The LNG facility is expected to become operational with the first LNG export in 2014. A workforce of approximately 100 people is estimated to be required to operate the first train of the LNG plant, with an additional 75 extra people required for each additional train. Full four train development will require an approximate operational workforce of 325 people.

The impact of the operation phase of the LNG facility was modelled using an approach based around the impact of a similar project in 2006. The Rio Tinto Yarwun Alumina Refinery (Yarwun refinery) was identified as a similar project in terms of its nature and location. The Yarwun refinery was commissioned in late 2004, with the first full year of operation in 2006. The project employed approximately 431 permanent operational staff. The Yarwun refinery is located just outside Gladstone, so it is assumed the workforce was based in Gladstone and interacted with the Gladstone housing market. The location and nature of the Yarwun refinery are similar to the Project. Hence, the impact that the Yarwun project had on property values is used as a basis to estimate the impact that the Project is expected to have on property values.

The effect of the Yarwun project on the Gladstone property market, and the implications for the Project is detailed in Volume 5 Attachment 45.

The utilisation of the stock of dwellings at the commencement of the Project will determine the amount of additional dwelling stock that is required to accommodate the workers. In a market where there is a low level of accommodation for rent or sale, the commencement of the Project will absorb most of the accommodation that is available, and increase demand for new dwelling stock. In practical terms, this means that there would be fewer homes for sale, lower rental vacancy rates, and an increase in the number of homes built in the region. These housing market changes would lead to increases in property values in the region. As detailed in Section 1.3.2, the availability of residential land in Gladstone presently is quite high, which is expected to dampen the impact of the Project on property prices, particularly in the medium term as dwellings are built in response to demand.

Evidence suggests demand for houses in Gladstone has been relatively high over the last five years, with an average annual increase in housing prices of around 14% from 2004 to 2009. This contrasts with the average annual increase of 11.7 % for Australia as a whole. Despite this longer term demand the 12 months to October 2009 have seen a dampening of the housing market in response to the regional and global economic environment with house prices decreasing in the region by between 3% and 10%.

Australia Pacific LNG recognises that as a major development, creating around 325 new jobs in Gladstone, it is likely to have an impact on the local housing market. Based on the modelling as described in Volume 5 Attachment 45, it is anticipated that the impact of the operational phase of the LNG facility to average house prices in Gladstone, is expected to be approximately 8.9%. This is a maximum impact scenario, and assumes that all operational workforce will relocate to Gladstone from elsewhere and thus impact on the housing market. Australia Pacific LNG will seek where possible to source the operational workforce locally, and where this happens, the impact on the housing market will be reduced.

The impact to the Gladstone housing market is anticipated to occur through increased economic activity and demand for houses by the operational workforce. The 8.9% increase implies an average annual increase of 1.2% in property values in Gladstone compounded over 7 years from 2014 to 2020 inclusive. This occurs as the LNG trains ramp up to full operation from 100 employees (Train 1) in 2014 to 325 by 2020 (all four LNG trains). The anticipated impact of the Project on the Gladstone housing market during the operation phase will not occur in isolation from the construction phase. Although the impact may be compounded when the two phases overlap, it is also expected that as the construction phase winds down, some workers may leave Gladstone to seek other employment opportunities as operational staff move into the Gladstone market, thus balancing demand.

Although an increase in average house prices can be viewed as beneficial to home owners and investors, it places significant pressure on those households who do not own their own home, in particular those in the private rental market. Increased house prices and the expected resulting increase in rental prices has the potential to increase the proportion of families in housing stress and place greater demand on the public and community housing sectors. This is particularly the case for those people working in occupations such as nurses, teachers, cleaners and retail sales persons who may not realise increases to their income consistent with the increases anticipated in other sectors.

Cumulative impact to property prices

The anticipated impact on house prices through both the construction and operational phases of the project is likely to be compounded by cumulative increase in construction and operational workers migrating to Gladstone to work on other proposed major developments. The construction impact will

depend on the proportion of the workforce from other projects being accommodated in TAFs rather than the local housing market. It is anticipated that the majority of operational staff from the cumulative projects assessed will reside within the local housing market, thus placing further pressure on availability and costs.

The level of cumulative impacts on housing markets can be separated into demand and supply factors. On the demand side, the key factors that will determine pressures on the housing market will include:

- The actual pattern and timing of major developments, and the subsequent cumulative demands for housing supplies
- The extent of development in the local supply chain and contracting firms, with subsequent requirements for additional labour and housing
- The take up of construction and operational jobs by the existing labour force
- The rate of workforce migration to the area compared to the use of a non-resident workforce
- The preferences of the non-resident workforce for different housing options, particular over longer time frames.

On the supply side, the key factors that will determine pressures on the housing market will include:

- The amount of TAFs that can be used, particularly in periods of peak housing demand
- The extent to which some of the TAFs can be used for flexible, on-going housing demands
- The availability of different housing options to suit a variety of housing needs by the non-resident and semi-permanent workforces
- The provision of suitable land supplies, infrastructure development and planning and approval systems to underpin future housing development
- The ability of local housing markets to adjust to increased demands for housing.

The major projects housing policy being prepared by the Department of Communities (as detailed in Section 1.3.2) will play a pivotal role in addressing these supply and demand factors.

Residential rental costs

The Project has the potential to contribute to an increase in demand for rental accommodation, given that there may be higher demand for housing and a supply that is limited in the short to medium term (given the timeframes required to increase the housing stock). This could lead to low income families being unable to afford to rent through the private rental market, and contribute to higher rates of housing stress. The impact has the potential to occur during both the construction and operational phases as individuals and families move to Gladstone to take up opportunities associated with the Project.

Evidence for this potential impact is illustrated through a recent report prepared by Anglicare into the impact of market forces on the community housing market. The report found that the price and availability of rental housing in Gladstone has been negatively impacted by industrial development over the last decade. Since 2001, Anglicare's community housing waiting list has increased from 28 households to 91 households and the rent increases sustained by Anglicare were over $30,000 in both the financial year 2003-04 and 2004-05. Although rental prices and vacancy rates have dampened somewhat over the last 12 months, Anglicare anticipate that without appropriate mitigation

measures and planning from government and industry, the situation could again become worse in line with proposed major developments.

The size of the impact which could be associated with the Project in isolation is difficult to quantify, though is likely to be broadly similar, in terms of direction and relative scale, to the impact on house prices as detailed above, and will likely occur during both the construction and operational phases.

Commercial and industrial property prices

The Project has the potential to contribute to an increase in commercial and industrial property prices due to higher demand for commercial and industrial property. This demand is likely to come from new businesses being established in study area, in response to higher demand for goods and services associated with an increased workforce, and higher incomes. In addition, it is likely to come from established businesses expanding for the same reasons. When this is combined with a supply of new commercial and industrial properties that is limited in the short term (by the lead times required to obtain development approval and construct new commercial and industrial property developments), the effect is likely to be a decline in affordability for businesses of purchasing new commercial or industrial property, and hence slow economic growth in the region.

As discussed in Section 1.3.2, there is currently an oversupply of available industrial property in Gladstone relative to demand. It is expected that this will lessen the impact on prices, particularly in the short term to medium term. However, given the multiple projects planned for the Gladstone region, the likely effect in the longer term will be to put more upwards pressure on commercial and industrial property prices and other impacts as described above.

Demand on infrastructure

The Project may contribute to increased pressure on health services, recreational and cultural facilities and services, childcare places, educational places, and policing and emergency services from increased demand (given the expected influx of population into the region). This has the potential to lead to lower welfare and living standards if the increased demand is not met. More detailed analysis of the anticipated impact of the Project to local social infrastructure is provided in Volume 4 Chapter 20.

In addition to the demand on social infrastructure discussed in this section, the impact of the project on other infrastructure such as water, waste and transport are discussed in Volume 4 Chapter 11, Volume 4 Chapter 16 and Volume 4 Chapter 17 respectfully.

The current infrastructure facilities and services available in the regions are detailed in Table 1.11 below.

Table 1.11 Social infrastructure facilities and services available

Type of infrastructure	LNG facility
Hospitals	Gladstone Hospital
	Mater Misericordiae Hospital
Health care services	Seven Regions Health Care Centre
	Gladstone Public Health Unit
	Third Crossing Manor
	Gladstone Community Health Services Centre

Type of infrastructure	LNG facility
	Gladstone Care and Rehabilitation Centre
	Central Queensland Health and Rehabilitation
Childcare	Gladstone – 0.5 child care places per 100 children aged 0-4 years
Police	Eight police stations within the Gladstone Regional Council region
Emergency services	Eight ambulance service offices
	Gladstone urban fire services, and Curtis Island rural fire brigade
	28 additional rural fire services within Gladstone Regional Council region
	Seven SES offices, and Emergency Management Queensland office
	Two volunteer marine rescue services

One way to understand the scale of the economic impact is to look at the indicators of future demand, including the change in employment and industry value add within the region for the education, and health and community services sector. The economic impact of the Project on various sectors as detailed in Section 1.4.2 in Table 1.12, which highlight there may be an increase in the demand for both health and education services.

Table 1.12 Indicators of increase in regional demand in the Project regions for education, health and community services as a result of the operation scenario of the Project

Measure	Education	Health and community services
Change in employment (percent deviation from base case)	3.1%	3.4%
Change in industry value-add (percent deviation from base case)	3.1%	3.4%

Source: KPMG Econtech (2010)

The greatest impact is expected to be through the indirect effects of the Project. Indirect impacts include a growth in local businesses supplying the Project which require additional staff that would be expected to move to the region with their families as temporary accommodation may not be available to them. This is expected in lead to a growth in population which will in turn place greater demand on infrastructure and services.

It is however important to note that the model provides high level economic analysis based on standard industry multipliers and does not take into account supply side issues at the local level. Consultation with the Department of Education and Training indicated that primary and secondary state schools in Gladstone have the capacity to absorb an additional approximate 300-450 children and private schooling also holds capacity to absorb additional students. It is expected that the existing primary and secondary schools will be able to meet any additional demand associated with the Project construction workforce.

It is anticipated that increased demand on infrastructure and services as a result of the Project will be responded to by Government. In a media release unveiling the Blueprint for Queensland's LNG

Industry[6], the Queensland Premier noted that royalties received from LNG industry development would be instrumental in supporting infrastructure such as hospitals and schools.

The cumulative impact of multiple projects on the regions which the Project is located is shown in Table 1.13. These estimates indicate that there will be a significant increase in the demand for employment in both the education and health and community services sectors in the cumulative impact scenario, which likely indicates sizeable pressure on current services.

Table 1.13 Indicators of increase in regional demand in the Project regions for education, health and community services as a result of the operational cumulative impact scenario

Measure	Education	Health and community services
Change in employment (percent deviation from base case)		
Cumulative impact during operations	16.2%	17.6%
Change in industry value-add (percent deviation from base case)		
Cumulative impact during operations	16.2%	17.7%

Source: KPMG Econtech (2010)

The Gladstone Region social infrastructure strategic plan and the sustainable resource communities policy will play pivotal roles in identifying and planning for increased demand for services and infrastructure in the Gladstone region.

Employment and training

Skills demand during construction of the LNG facility

The Project will increase the demand for employment in the region, both directly and indirectly, during the construction phase of the Project. Forecasts prepared for this assessment indicate that the sectors which are expected to experience the largest increases in demand for employment in the Mackay-Fitzroy-Central West Queensland region are the construction, retail trade, health and community services, and education sectors. Table 1.14 shows the estimated maximum change in employment in different industry sectors in the LNG facility region during the construction phase of the Project.

Table 1.14 Largest potential increase in employment by industry during construction phase in the Mackay-Fitzroy-Central West Queensland region

Industry sector	Change in employment in construction phase	
	Number[1]	Percent
Construction	2,200	8.80%
Cultural and recreational services	100	4.80%
Retail trade	800	4.70%
Finance and insurance	200	4.50%
Accommodation, café's and	200	4.20%

[6] See http://www.dme.qld.gov.au/media_centre.cfm?item=791.0 for further information

Industry sector	Change in employment in construction phase	
	Number[1]	Percent
restaurants		
Health and community services	500	4.00%
Wholesale trade	400	3.90%
Personal and other services	200	3.90%
Education	500	3.80%
Communication services	100	2.80%

[1] Rounded to the nearest one hundred employees

Source: KPMG Econtech (2010)

Because of the relatively high employment and labour force participation rates in the study area, the construction of the LNG facility could contribute to skill shortages in industry sectors which experience high demand for additional labour during the construction phase of the LNG facility. This is particularly the case given that there will be a number of LNG projects in the region. This is estimated to create an increase in demand for labour of 14% in the Mackay-Fitzroy-Central West Queensland region. The potential cumulative effect of this will be to compound the skill shortages.

The peak construction period for the construction of Train 1 and Train 2 occurs in 2013, in which an estimated 2,100 construction workers will be required. The peak construction period for Train 3 and Train 4 occurs in 2018, where an estimated 2,100 construction workers will also be required. Workforce requirements between 2015 and 2016 are smaller (approximately 400 workers) as the construction of the first two LNG trains is completed and gradual ramping up occurs for the construction of the second two LNG trains. The following occupation types are anticipated to be in demand during the construction phase:

- Site preparation workers
- Piping trades
- Civil engineers
- Scaffolding trades
- Tank workers
- Jetty subcontractors
- Building subcontractors
- Electrical trades
- Instrumentation trades
- Painting, fireproofing and insulation workers
- Instrumentation trades
- Millwright trades
- Ironworking trades.

Energy Skills Queensland has recently undertaken a skills audit with the aim of identifying the areas in which critical skill shortages are likely to emerge with the expansion of the LNG industry. The areas in which key skill shortages are likely to emerge, are detailed in Table 1.15.

Table 1.15 Occupations with expected critical skill shortages

Occupation category	Occupation	Required qualifications
Vocational	Drilling assistants	Certificate II in Drilling and Gas Onshore
	Production technicians	HSC Senior/Certificate III in Process Plant Operations
	Maintenance technicians	Certificate III in Engineering – Mechanical Trade (Maintenance – Diesel fitting and vendor training)
	Electrical and instrumentation technicians	Certificate III in Electro-technology (Maintenance Systems and Instrumentation)
	Logistics technicians/administrators	Certificate III in Transport and Logistics
Professional and paraprofessional	Petroleum engineers	Bachelor of Engineering
	Geologists and geophysicists	Bachelor of Science/Geology

Source: Energy Skills Queensland (2009)

Skills demand during operational phase of the LNG facility

The Project will increase the demand for labour, both directly and indirectly, during the operational phase. Forecasts prepared for this assessment indicate that the sectors which will experience the largest increases in demand for employment are the mining (including LNG production), construction, retail trade, education, and health and community services sectors. Table 1.16 shows the projected change in employment in different industry sectors in the operation phase, in the Mackay, Fitzroy and Central Western Queensland area.

Table 1.16 Industries expected to experience a rise in regional employment during the operation phase

Industry sector	Change in employment in Mackay-Fitzroy-Central Queensland area during operation phase (%)
Mining	8.9%
Construction	1.9%
Wholesale trade	1.8%
Retail trade	1.7%
Finance and insurance	1.7%
Health and community services	1.7%
Cultural and recreational services	1.7%

Industry sector	Change in employment in Mackay-Fitzroy-Central Queensland area during operation phase (%)
Personal and other services	1.7%
Education	1.6%
Accommodation, café's and restaurants	1.6%
Communication services	1.6%

Source: KPMG Econtech (2010)

As with the construction scenario, skills shortages during the operational phase are expected to be exacerbated as a result of high employment and labour force participation rates, thus restricting the local pool of labour available. This is particularly the case given that there will be a number of LNG projects in the region, the cumulative effect being to compound the skill shortages.

During the operation phase of the LNG facility, the workforce will start at 100 workers, increasing with each train added, until the maximum workforce of 325 staff is reached when the fourth train comes online after 2020. The expected skills base and proportion of total workforce for the operational phase of the Project when all four LNG trains are in operation (i.e. maximum workforce requirement) is summarised in Table 1.17.

Table 1.17 Operational workforce skills base

Skill category	Percentage of operations workforce (%)
Management	2%
Engineering	6%
Administration	1%
HR	5%
HSE & quality	3%
Marine	1%
Supply chain	6%
Maintenance	9%
Operations	47%
Contractors	17%
Security	3%

Source: Australia Pacific LNG

Cumulative impact of skills demand during the operational phase

The cumulative effect of multiple projects in the LNG facility study area is likely to exacerbate skills shortages. It is anticipated that the operational phases of the various projects will directly and indirectly led to 15,000 additional jobs in the Mackay-Fitzroy-Central West Queensland region. Table 1.18 shows the number and percentage cumulative increase in employment during the operation phase, by

industry sector. The largest increase in employment is forecast to be in the mining sector (including LNG production) with an additional 2,500 workers. In addition, the retail trade, education and health and community services sectors are also likely to see large increases in demand for employment, and as such skill shortages may also be significant in these industry sectors.

Table 1.18 Industries expected to experience a rise in employment due to the cumulative effects during the operation phase

Industry sector	Cumulative change in employment in Mackay-Fitzroy-Central West Queensland region	
	Number[1]	Percent
Mining	2,500	18.1%
Manufacturing	2,100	11.3%
Transport	900	8.5%
Construction	1,300	8.2%
Electricity, gas and water	300	7.8%
Wholesale trade	700	7.7%
Government administration and defence	500	7.7%
Personal and other services	200	7.7%
Finance and insurance	300	7.6%
Retail trade	1,000	7.5%
Health and community services	900	7.5%
Cultural and recreational services	100	7.5%
Communication services	100	7.2%
Education	1,100	7.0%
Accommodation, café's and restaurants	400	6.8%
Property and business services	600	4.6%

[1] Rounded to the nearest one hundred employees
Source: KPMG Econtech (2010)

Local business employment

The Project may contribute to increased pressure on local business employment. With low unemployment rates in the study area, there is some concern that the Project may attract workers who are currently employed by local businesses and as such place pressure on local businesses to retain staff. However, one of the potential positive impacts from the Project is the potential to encourage individuals not currently employed in the labour force to return to work. By doing so the Project has the potential to increase labour force participation and increase employment (estimated to be an increase in total direct and indirect employment in the region of around 6,900 jobs during the construction phase and 9,000 jobs during operations). Furthermore, the situation is currently less severe in Gladstone in comparison to the gas fields and pipeline study areas due to recent lay-offs in the

minerals processing and manufacturing sectors in Gladstone and elsewhere in the Bowen Basin as a result of the GFC. Although the resource sector is expected to improve in 2010, it is expected that there still may be capacity within the local and regional employment market to absorb the increase.

Cumulative impacts on local business employment

The pressures on local employment will be magnified by the fact that there will be a number of new projects in the region. Modelling undertaken for this assessment estimate that the cumulative impact of the projects in the region during the operational phase will be demand for an additional 15,000 jobs.

Business and industry

Opportunities for local businesses

The Project is likely to provide the opportunity for local and regional businesses to supply goods and services to Australia Pacific LNG contractors, staff and families. As such it is anticipated that there will be increased demand for goods and services both directly (e.g. bread provided to TAFs, hairdressing services to Project staff) and indirectly (e.g. childcare places for families of Project staff in the operational phase). The overall effect is likely to be an increase in consumption of 0.1% (note that consumption data is only available at the national, not regional level).

Cumulative impact of opportunities for local businesses

In addition, the demand for goods and services is projected to increase due to the cumulative effect of multiple projects in the region. Modelling prepared for this assessment forecasts that the total employment in the LNG facility study area will likely rise by 15,000 jobs. The direct and indirect effect of the cumulative projects is projected to increase real private consumption in Australia by 0.2%.

Capacity of local businesses to attract and retain workers

The Project is expected to have an impact on the capacity for local businesses to attract and retain workers particularly as a result of upward pressure on wages (i.e. workers may be able to obtain jobs with Australia Pacific LNG which may pay a higher rate than local businesses). Modelling undertaken for this assessment indicates that real after tax wages overall will increase by 0.1%. This is an overall increase, and may mask differences between different businesses and industry sectors.

Cost of building materials

The Project has the potential to contribute to an increase in price of building materials due to strong demand particularly in local areas, potentially reducing the willingness of developers to build new and upgrade existing residential, commercial and industrial developments in the area and/or increasing the cost of these developments to the consumer.

For the LNG facility, it is likely that the Project will contribute to an increase in prices of building materials in the short to medium term, as the supply side in local areas adjust to the increase in demand associated with the Project. This is particularly the case given the multiple projects in the region, which will further increase demand for building materials, and drive up prices.

Impact on commercial fisheries

The Project has the potential to have an impact on commercial fisheries during the construction of the wharf and jetty structures associated with the LNG facility, and during the operational phase, with the movement of ships which could impact on industry output. The impact however is expected to be

minimal, given the small size of the industry and the fact that the areas impacted by development of the LNG facility are understood not to be prime locations for commercial fisheries. Indeed, the commercial fishing industry employed only 0.2% of the labour force in the LNG facility study area.

Although not quantified, the area around the proposed LNG facility is utilised by recreational anglers and to a lesser degree by commercial mud crabbers and net fisheries. As detailed above, it is not considered however, to be a prime location for any of these fishing activities. While, commercial beam trawling is also licensed to operate within the Port Curtis region, available information suggests that the level of commercial fishing effort throughout the region is low.

Further details of the anticipated impact to commercial fisheries are provided in Volume 4 Chapter 10.

Impact to transport infrastructure

The Project will contribute to increased traffic movements. Moreover, heavy vehicles and movement of equipment may lead to temporary, localised damage to road surfaces during the construction phase (refer to Volume 4 Chapter 17). This may lead to an increase in travel times to work given the larger population, which may in turn increase the cost of living for households and businesses.

Impacts associated with other environmental factors

The Project has the potential to impact local businesses during the construction phase due to environmental factors such as noise and concerns over air quality. Given that the construction of the facility will take place on Curtis Island, away from the majority of business and tourism enterprises, it is anticipated that any impacts will arise due to increased traffic movements rather than construction itself. In the context of Gladstone, the increased levels of noise and traffic has the potential to have a small impact on tourism and retail businesses, as these factors may discourage people from visiting the region in which the construction activity is taking place either as a visitor or as a local to shop. It is anticipated that the cumulative impact of multiple projects in the region would be greater than the Project in isolation.

1.4.4 Cumulative impact assessment

The Project is the largest CSG to LNG project that is currently under consideration in Queensland. In addition, there are also a number of other major projects proposed in the same region of Queensland. Thus, an important aspect of the economic assessment is to also examine the cumulative impacts of proposed major projects on the regional, state and national economies. This section provides the results of modelling the ongoing economic impacts of the cumulative impact scenario.

The projects modelled in the cumulative impact scenario can generally be listed under three broad categories:

- Mining and energy projects
- Manufacturing projects
- Infrastructure and transport projects.

The cumulative impact scenario has assumed that each project impacts the economy independently, with no sharing of resources.

The following results represent the deviation from the baseline scenario, where no projects proceed. This captures the effects on the economy of all 30 proposed projects as detailed in Section 1.2.2.

National economy

Once these projects are fully operational, the national economy is expected to benefit from:

- Higher real GDP on average by A$6.1 billion annually
- Increased real national income, driving both higher consumption and investment
- Higher consumer welfare (standard of living) of around A$1.1 billion annually, on average.

With respect to improving household living standards as a result of the cumulative impact scenario, the modelling predicts that per capita increase in living standards in Queensland will not be significantly different to the national figure due to assumed flexibility within the model. However, it is acknowledged that in practice, labour does not also move as fluidly between states as the model predicts due to a range of social, economic and personal reasons. As such it is anticipated that there may be a small Queensland wage premium to develop as a result of multiple projects going ahead, due to increased demand for labour within Queensland and a greater number of high skilled jobs which attract higher levels of remuneration, thus increasing disposable income to a greater degree. Therefore it is expected that the level of improvement to standard of living in Queensland will probably exceed the national impact

Because of the anticipated increase to Australian real national income, the price of non-tradeables relative to tradeables – the real exchange rate – is expected to be higher. Modelling illustrates that in the cumulative impact scenario, the Australian dollar could appreciate by 2.1%.

The change in the real value of the Australian dollar would impact on both export and import levels in Australia. Specifically, with an appreciation of the exchange rate, Australia's international competitiveness on global markets would be marginally lower, leading to lower demand for Australian exports (although this will not be the case for LNG exports which will continue to increase).Trade exposed industries such as manufacturing and agriculture are expected to experience lower production levels following the appreciation of the Australian dollar. Although an appreciating Australian dollar poses a number of challenges to export dominated industries, there are also a number of positive benefits including a reduction in the cost of imported goods and services thus reducing living costs for households

Queensland economy

At the state level, once the projects are fully operational:

- The projects are estimated to lead to higher employment in Queensland by an average of 55,000 jobs (both direct and indirect).
- Queensland's GSP is expected to be A$6.9 billion higher on average each year (or 3.6 %).

As with the impact of the Project in isolation, the contribution to the Queensland economy is greater than for the Australian economy because of the location of the 30 projects in Queensland. This will mean that a higher proportion of inputs (labour, goods and services) would be sourced from within Queensland than elsewhere in Australia.

Regional economy

At full operation, the 30 projects are estimated to have the following impacts on the regional economy within which the LNG facility is situated:

- In the Mackay-Fitzroy-Central West region which includes the LNG facility study area, the projects are estimated to lead to higher employment by an average of 15,400 jobs

- Mackay-Fitzroy-Central West's GRP is expected to be A$2.6 billion higher on average each year (or 10.0 %).

The primary cumulative economic impacts of the projects will be positive, leading to increased incomes, expenditure and employment. The Gladstone area will be a key beneficiary of the impacts on the Mackay-Fitzroy-Central West region. These impacts will create substantial employment opportunities in Gladstone, specifically in the mining, manufacturing and transport industries. This is primarily due to the development of large LNG facilities, aluminium smelter and refinery, as well as steel production and major port and rail redevelopments.

As well as directly stimulating output, if all 30 proposed projects included in the cumulative impact scenario proceed, there will be a range of indirect flow on benefits. This will occur through an increase in demand from the projects' supply chains, and increased demand by the project workers. This, in turn, would boost revenue in the Mackay-Fitzroy-Central West. This higher revenue will then flow through to extra spending in the regions' consumer-oriented industries, such as retail trade, health and community services and cultural and recreational services

1.5 Conclusion

1.5.1 Assessment outcomes

The Project is expected to benefit the local, regional, state and national economies. The Project represents a significant investment in value adding to CSG resources, and will help create a new export industry in Queensland, diversifying the state's economic base. The Project is estimated to stimulate an increase in Queensland GSP of approximately A$2 billion per annum, creating an average of 9,000 jobs (directly and indirectly) each year in Queensland. Australia Pacific LNG is committed to sourcing inputs (labour, goods and services) from the local and regional economy where practicable. For the region within which the LNG facility is located, the Project is anticipated to contribute to:

- An increase in value added by A$803 million in the construction phase, and by A$450 million during the operation phase per annum in the Mackay-Fitzroy-Central West region
- An increase in employment (both direct and indirect) by around 4,100 jobs in the construction phase and nearly 3,000 jobs during the operation phase in the Mackay-Fitzroy-Central West region.

Through the economic impact assessment process, a number of impacts that the Project is anticipated to have on to the local economic environment have been identified. Mitigation strategies have been developed with the aim of enhancing benefits and reducing adverse economic impacts from the Project, including supporting local business, reducing unsustainable upward pressure on the housing market and collaborating with stakeholders to improve the capacity of the local workforce. Full details of mitigation strategies and commitments are provided in Volume 4 Chapter 24.

1.5.2 Commitments

To manage potential impacts of the Project on the local and regional economic environments, Australia Pacific LNG have committed to a range of strategies. Those which are most relevant to the economic environment are detailed below, with a full range of social and economic commitments detailed in Volume 4 Chapter 20.

Income and affordability

Australia Pacific LNG will:

- Provide temporary accommodation facilities for non-local construction staff and contractors.
- Expect the operations workforce for the LNG facility to live within the local community in the general housing pool
- Mitigate potential impacts on housing affordability and availability, through community programs that involve working with government and agencies that provide housing to people in distress

Employment and business

Australia Pacific LNG will:

- Continue to use existing methods or develop new methods to attract people to the workforce who are local to the region, as well as those from under-represented groups
- Implement a local content strategy, to participate in or establish programs to assist qualified local and regional businesses with tendering opportunities for providing goods and services for the Project
- Aim to build collaborative partnerships with government and community organisations, to enhance the capacity for employers to provide jobs and for local people to develop skills and obtain employment
- Continue to use existing methods or develop new methods to attract under-represented groups to the workforce
- Work with government, the community and industry to plan for potential cumulative impacts and to share information about potential impacts and mitigation measures
- Ensure contracts with suppliers and contractors are aligned with Australia Pacific LNG's sustainability principles and objectives
- Work closely with Energy Skills Queensland's CSG/LNG Skills Taskforce to help meet the growing skills demand by:
  - Creating community awareness about the industry and opportunities
  - Enhancing vocational training
  - Facilitating career advice and work readiness programs for new entrants and mature entrants from related industries.

Education and training

Australia Pacific LNG will:

- Provide specialised LNG operator training programs, including potential opportunities for on site training on an existing LNG facility
- Implement CSG/LNG gateway programs with high schools in the region, in partnership with providers, to promote career opportunities and facilitate employment in the CSG/LNG industry
- Continue to collaborate on programs with government, training and educational groups that build the local skills base, to meet the specific needs of the industry and other impacted sectors.

This includes ongoing development of apprenticeship, traineeship, scholarship and higher education programs.

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