Australia Pacific LNG Project

Volume 3: Gas Pipeline

Chapter 21: Economic Impact Assessment

Contents

21. Economic impact assessment 1
21.1 Introduction 1
21.1.1 Purpose 1
21.1.2 Scope of works 2
21.1.3 Economic impact assessment terminology 2
21.1.4 The gas pipeline study area 3
21.2 Methodology 5
21.2.1 Economic baseline 5
21.2.2 Economic modelling 5
21.2.3 Estimating the impact on property values 8
21.3 Existing economic environment 8
21.3.1 Regional and state economic overview 8
21.3.2 Local economic overview 13
21.4 Economic impact assessment 20
21.4.1 Identification of potential economic impact categories 21
21.4.2 Economy wide impacts 22
21.4.3 Local and regional impacts 28
21.4.4 Cumulative impacts of upcoming major projects including the Australia Pacific LNG Project 38
21.5 Conclusion 40
21.5.1 Assessment outcomes 40
21.5.2 Commitments 40
References 42

Figures

Figure 21.1 Statistical local area boundaries and the gas pipeline study area 4
Figure 21.2 Building price index – general construction industry, Queensland and Australia 11
Figure 21.3 Annual change to building price index – general construction 11
Figure 21.4 Building price index – building construction and non-building construction sectors, Queensland and Australia 12
Figure 21.5 Average % change in building price index – building construction and non-building construction sectors, Queensland and Australia 12

Figure 21.6 Unemployment rate, gas pipeline SLAs – 2001 to 2009 14

Figure 21.7 Median sales prices per square metre for agricultural land in gas pipeline study area 17

Figure 21.8 Number and median value of sales per m^2 in gas pipeline study area – 2004-05 to 2007-08 18

Figure 21.9 Average weekly rent, gas pipeline SLAs, 1996 to 2006 (A$) 20

Figure 21.10 Project construction workforce 2009-2027 (direct only) 23

Figure 21.11 Average economic impacts of the construction phase 23

Figure 21.12 Annual operation scenario national macroeconomic effects (A$m in 2006-07 prices) ... 25

Figure 21.13 Regional industry production effects during operation (% deviations from baseline) 26

Figure 21.14 Regional price index, May 2006, Brisbane = 100 29

Figure 21.15 Workers required, by profession, during operation of the gas pipeline – share of total required 2009 to 2020 35

Tables

Table 21.1 Real gross regional product (A$m), 2000-01 and 2005-06 8

Table 21.2 Sector growth and contribution to total economic growth, 2000-01 to 2005-06 9

Table 21.3 Labour price index for total hourly rates of pay Queensland and Australia 10

Table 21.4 Labour price index, total hourly rates of pay by industry sector, Australia 10

Table 21.5 Regional price index, May 2006 13

Table 21.6 Median sales prices for houses, gas pipeline urban localities (2009) 19

Table 21.7 Weekly median advertised rent of gas pipeline urban localities 20

Table 21.8 Impact categories 21

Table 21.9 Social infrastructure facilities and services available – gas pipeline study area 31

Table 21.10 Indicators of increase in regional demand for education, health and community services in project region – Project's operational phase 32

Table 21.11 Indicators of increase in regional demand for education, health and community services in project region 32

Table 21.12 Maximum employment increase during construction - Mackay-Fitzroy-Central West Queensland region 33

Table 21.13 Maximum employment increase during construction - Darling Downs-South West Queensland region 33

Table 21.14 Occupations with expected critical skill shortages 34

21. Economic impact assessment

21.1 Introduction

21.1.1 Purpose

This chapter discusses the economic impact assessment of the main gas transmission pipeline (the gas pipeline) element of the Australia Pacific LNG Project (the Project). This assessment explores the economic impacts associated with the development, construction and operation of the gas pipeline. It also looks at 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 the appropriate measures for impact management and mitigation, designed to reduce negative impacts and maximise the positive benefits. There are three steps in the economic impact assessment process:

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

The mitigation measures are detailed in the social impact assessment in Volume 3 Chapter 20.

Development of the gas pipeline has the potential to impact on the existing economic environment of the local and regional economies within the gas pipeline study area. Of Australia Pacific LNG's 12 sustainability principles, a relevant subset (detailed below) will be applied to the planning, design, construction and operation of the gas pipeline to ensure that such impacts are avoided or reduced.

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
- Creating and maintaining a rewarding workplace for employees and contractors by encouraging personal development, recognising good performance, valuing teamwork and fostering equality of opportunity and inclusivity
- Identifying, assessing, managing, monitoring and reviewing risks to its workforce, its property, the environment and the communities affected by its activities
- Ensuring that all employees and contractors work consistently with its sustainability principles, commitments, values and systems
- Engaging regularly, openly and transparently with people and communities affected by its activities, considering their views in its decision-making and striving for positive social outcomes
- Working cooperatively with communities, governments and other stakeholders to achieve positive social and environmental outcomes, seeking partnership approaches where appropriate.

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 project workforce requirements on the existing local and regional labour pool are a key focus of the economic impact assessment. Training programs will be designed to support the development of the Project, while simultaneously providing diverse transferable skills that will provide employees with long-term career paths.

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

21.1.2 Scope of works

The economic impact assessment has been completed according to the terms of reference for the Project as set by the Coordinator-General, December 2009. The terms of reference require Australia Pacific LNG to describe the existing economic environment, assess identified and associated economic impacts, and present appropriate mitigation strategies. In particular, the Project is required 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 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 terms of reference 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.

21.1.3 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 throughout this chapter includes:

- 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.

21.1.4 The gas pipeline study area

The gas pipeline is approximately 450km in length, stretching from the coal seam gas (CSG) fields in the Walloons area near Miles. From here it tracks north towards the proposed liquefied natural gas (LNG) facility at Curtis Island, near Gladstone. Development of the gas pipeline and associated infrastructure is to be completed by Origin on behalf of Australia Pacific LNG.

The study area for the pipeline's local economic environment has been defined geographically according to the following statistical local areas (SLAs) as classified by the Australian Bureau of Statistics (ABS) (2007):

- Banana
- Taroom
- Calliope Part B.

The main communities located along the gas pipeline route include Miles, Wandoan, Theodore, Biloela and Callide. Miles is located in the Murilla SLA which is discussed in detail in the gas fields' economic impact assessment in Volume 2 Chapter 21. The gas pipeline also passes to the north of Gladstone before it reaches the LNG facility on Curtis Island. The Gladstone economic context is discussed briefly in this chapter, and a more detailed discussion is provided in Volume 4 Chapter 21 and Volume 5 Attachment 45.

However, the economic impact and contribution of the Project is anticipated to extend to the regional, state and national economies. Therefore, the direct and indirect economic impacts at three geographic levels have been modelled, including:

- National economy of Australia
- State of Queensland
- Regional economies of the Darling Downs-South West region and the Mackay-Fitzroy-Central West region through which the gas pipeline traverses.

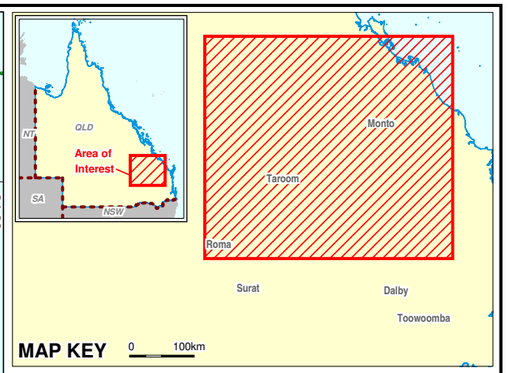
Figure 21.1 shows the gas pipeline study area.

© Commonwealth of Australia (Geoscience Australia) 2009. © The State of Queensland (Department of Natural Resources and Water) 2009. © WorleyParsons Services Pty Ltd
Users of the information recorded in this document (the Information) accept all responsibility and risk associated with the use of the Information and should seek independent professional advice in relation to dealings with property.

Emerald (S)
Mount Morgan (S)
Duaringa (S)
GLADSTONE
Gladstone (C)
CALLIOPE
Calliope (S) - Pt A
Calliope (S) - Pt B
Miriam Vale
Miriam Vale (S)
Biloela
Moura
Banana (S)
Woorabinda (S)
Theodore
Monto (S)
Monto
Burnett (S) - Pt B
Kolan (S)
Perry (S)
Eidsvold (S)
Biggenden (S)
Biggenden
Gayndah (S)
Mundubbera (S)
Kilkivan (S)
Murgon (S)
Goomeri
Wondai (S)
Cherbourg (S)
Kingaroy (S)
Wambo (S)
Chinchilla (S)
Wandoan
Taroom
Taroom (S)
Injune
Bungil (S)
Bendemere (S)
ROMA
Roma (T)
Miles
Chinchilla
Murilla (S)
Jandowae

149.00 150.00 151.00 152.00
24.00 25.00 26.00

Dawson Highway
Fitzroy Dev Road
Warrego Highway
Roma - Taroom Road
Leichhardt Hwy
Eidsvold - Theodore Road



LEGEND

- Major towns
- Major Drainage
- Railway
- Gas pipeline study area
- Road
- Gas pipeline route
- SLA Boundary

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).

Source Information

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

Preferred gas pipeline alignment
Origin Energy on 03/11/2009

Pipeline
Department of Mines and Energy, MERLIN Mining Tenures system and Database (MTDB) 2009
Commonwealth of Australia (Geoscience Australia) 2009

Road
Department of Main Roads, Queensland 2009

0 20 40km
SCALE - 1 : 1,250,000 (at A3)
Latitude/Longitude
Geocentric Datum of Australia 1994
N

AUSTRALIA PACIFIC LNG PROJECT

Volume 3 Chapter 21
Figure 21.1 Statistical Local Area Boundaries

K:\ORIGIN\301001-00448\GIS\Maps\00448-00-EN-DAL-2389-Rev0(Vol3Chp21_SLAs).wor

21.2 Methodology

21.2.1 Economic baseline

Data relevant to the existing economic environment has been sourced from government agencies, such as the ABS, and the Department of Education, Employment and Workplace Relations. The most up-to-date data was used wherever possible, but 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 environmental impact statement, 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.

21.2.2 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. The methodology is discussed below, and more information is available in Volume 5 Attachment 44.

Note that the economic impacts are modelled for the whole of the Project from the gas fields through to the LNG facility, so 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) assumes the proposed additional LNG exports and natural gas production resulting from the Australia Pacific LNG Project does not proceed
- Scenario 2 (construction 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) assumes the Project's production of CSG and LNG increases by the amount expected from the 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 stage 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 initial10 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 scenario* of the Project in the short to medium-term will arise as a result of the direct stimulus provided to the economy through investment in the construction of the gas fields, gas pipeline and LNG facility. The economic impacts will mainly manifest in construction related industries, as new buildings and infrastructure (including the pipeline) 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 economic modelling uses assumptions regarding the expected construction workforce size and timing. Construction of the gas pipeline is expected to take 18 months, commencing in 2012 and concluding in 2013. Construction of the gas pipeline will require an estimated workforce of 805 employees. The construction of the gas pipeline will commence in the vicinity of Miles, working towards the north for completion in Gladstone. The workforce will involve a main works crew of 600 and three special purpose crews of 30, 75 and 100 workers all of whom will reside in temporary accommodation facilities.

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 five to 10 years). It distinguishes 108 industries producing 672 products, importantly distinguishing LNG from natural gas and oil production.

The MM600+ model is able to capture the operational 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 Project 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 (which incorporates the study area), and to the Queensland economy are also estimated using MM600+.

During the operational phase of the Project it is expected a workforce of 20 will be required, commencing in the fourth quarter 2013. It is anticipated the operational workforce will live in Gladstone, gas fields or towns along the gas pipeline route.

Benefits of CGE models

CGE models like MM600+ and MMR provide better estimates than input-output (IO) 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 project life. 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 comparison of data.

Cumulative impacts

In addition to the Australia Pacific LNG Project, there are a number of other major projects planned for the region within which the Project is situated. It is important to understand how this group of projects, which includes the Australia Pacific LNG Project, 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. The projects are:

- Australia Pacific LNG Project
- Arrow Energy Gas Field Development
- Australian Inland Rail Expressway - Toowoomba to Gladstone Railway
- Boyne Smelters
- Cameby Downs (Coal) Expansion Project
- Central Queensland Pipeline
- Darling Downs Power Station
- Dawson Expansion Project
- East End No. 5 Mine
- Fisherman's Landing Port Expansion
- Gladstone LNG (GLNG)
- Gladstone LNG – 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 Australia Pacific LNG Project, the CGE MM600+ model was used to assess the economy-wide cumulative impact of the 30 projects identified. Due to the specific geographical nature of the projects, these impacts were then also examined at a state and regional level.

To evaluate the maximum impact associated with the projects, it has been assumed that all projects will go ahead. Data on each project came from Australia Pacific LNG and each respective project proponent's website and released information. Data on total Australian production was sourced from the Australian Bureau of Agricultural and Resource Economics.

21.2.3 Estimating the impact on property values

In addition to modelling the expected direct and indirect impacts of the Project on the economy, the economic impact assessment also looks at the potential impact of the Project on property values at a local and regional level.

In broad terms, the impacts on property values were estimated by combining quantitative analysis (where possible) and qualitative discussion. It should be noted that the methodology used to estimate changes in property values is conditional on a range of factors (such as zoning laws) and these factors are subject to change over time. Hence, this analysis provides an indicative estimate of the proposed changes to property values over the long term.

The impact of the gas pipeline on property values in the pipeline region is assessed with respect to its construction and operation. The analysis is primarily qualitative in nature and focuses on the long run impacts in the operational scenario.

21.3 Existing economic environment

The local economies traversed by the gas pipeline are dominated by the agriculture, forestry and fishing industry sector, with Gladstone the major industrial and service centre for the northern component of the gas pipeline study area. The majority of the gas pipeline is located in Banana Shire Council which is a rich farming, grazing and mining area. This section provides a summary of the existing economic environment within which the gas pipeline is located, including an overview of the regional and state economies and description of the local economy with respect to labour force, infrastructure, key industries and property values.

21.3.1 Regional and state economic overview

Contribution to gross regional product by industry

Gross regional product (GRP) estimates were prepared by Queensland Treasury for 2000-01 and 2005-06 for statistical divisions (SD) in Queensland. Estimation of gross regional product at the lower, more disaggregated statistical local area (SLA) level does not provide robust statistics particularly for the smaller SLAs within the gas pipeline study area. As such, Queensland Treasury estimates at the SD level have been adopted for this study. Queensland Treasury recommends the estimates be interpreted with extreme care given the paucity of economic statistics available at a regional level.

The gas pipeline study area is contained within the statistical divisions of Darling Downs and Fitzroy. GRP estimates for 2000-01 and 2005-06 are provided in Table 21.1. In 2005-06, the estimated GRP of the combined regions was A$23.25 billion, accounting for 12.6% of gross state product. Both statistical divisions recorded positive GRP growth between 2000-01 and 2005-06, but GRP growth in the Darling Downs SD was below the state average.

Table 21.1 Real gross regional product (A$m), 2000-01 and 2005-06

Region	2000-01	2005-06	Average annual growth rate
Darling Downs SD	6,124	9,119	8.3%
Fitzroy SD	7,913	14,126	12.3%
Queensland	114,684	183,983	9.9%

Note: Figures are chain volume measures and are expressed in 2005-06 Australian dollars
Source: Office of Economic and Statistical Research (OESR) (2008)

A summary of the three best performing industries (defined by the ABS) for each statistical division in the gas pipeline study area is provided in Table 21.2. The mining sector (which includes CSG/LNG) in Darling Downs SD was the best performing industry across all SDs, growing by 51.1% between 2000-01 and 2005-06. In terms of contribution to total economic growth within a SD, the mining industry in Fitzroy SD was the strongest, contributing to 1.5% of total growth. It is important to note that LNG production is defined in both the ABS input output tables and the Australian and New Zealand Standard Industrial Classification (ANZSIC) industry definitions as mining output.

Table 21.2 Sector growth and contribution to total economic growth, 2000-01 to 2005-06

Region	2000-01 to 2005-06	
	Sector growth	**Contribution to total growth**
Darling Downs SD	Mining (51.1%), electricity and gas (17.8%) and finance and insurance (14.7%)	Mining (0.6%), finance and insurance (0.6%) and agriculture, forestry and fishing (0.5%)
Fitzroy SD	Construction (11.7%), finance and insurance (8.2%) and property and business services (7.2%)	Mining (1.5%), construction (0.6%) and manufacturing (0.5%)
Queensland	Finance and insurance (9.4%), construction (8.8%) and property and business services (7.3%)	Construction (0.6%), property and business services (0.6%) and manufacturing (0.4%)

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 and housing, Queensland's labour price index (excluding bonuses) grew by 4.3% per annum, compared to 4.1% per annum for the national average, as shown in Table 21.3.

Table 21.3 Labour price index for total hourly rates of pay 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%
Avg 2006-07 to 08-09	N/A	4.3%	N/A	4.1%

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

Key industry sectors identified in the gas pipeline study area include:

- Agriculture, forestry and fishing
- Construction
- Mining (including CSG/LNG)
- Manufacturing
- Retail trade.

The labour price index is available for all above listed industries at the national level, with the exception of agriculture, forestry and fishing and shown in Table 21.4. The average annual growth rate in total hourly rates of pay (excluding bonuses) was highest for the mining and construction sectors. Growth in total hourly rates of pay in manufacturing and retail trade sectors has fallen below the average for all sectors since the 2006 Census.

Table 21.4 Labour price index, total hourly rates of pay 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 21.2. 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 21.3.

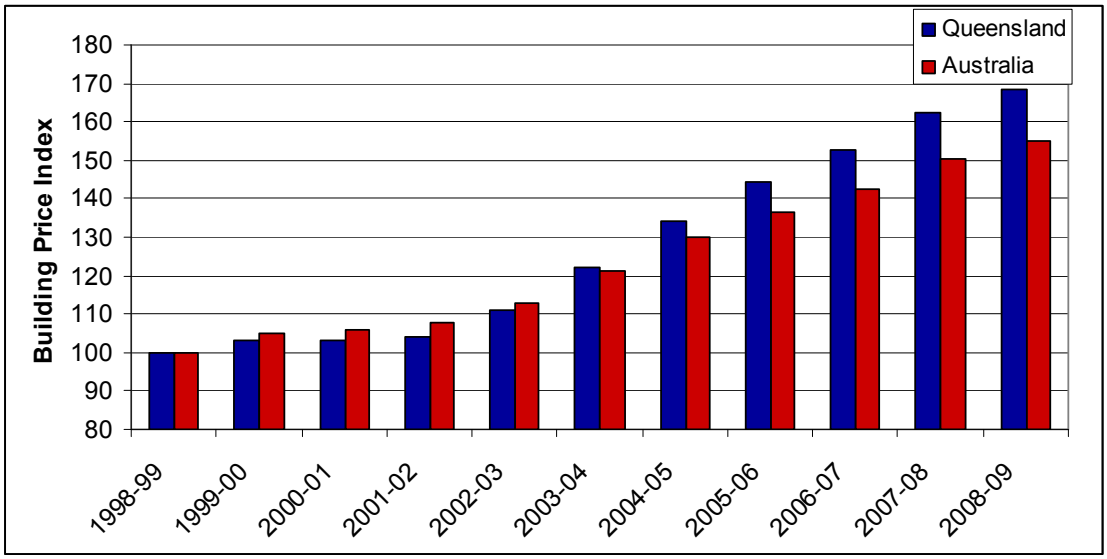


Figure 21.2 Building price index – general construction industry, Queensland and Australia

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

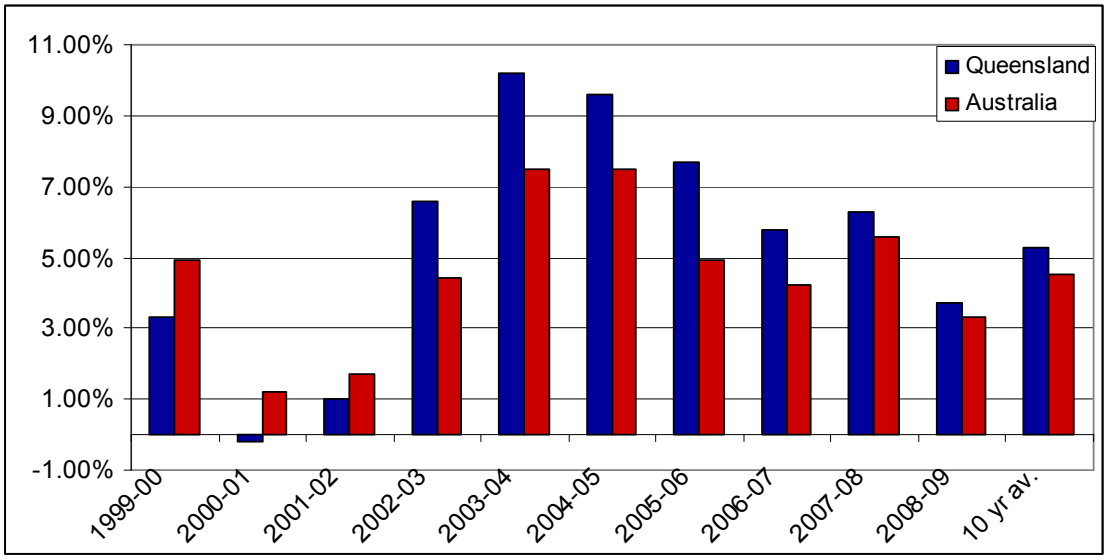


Figure 21.3 Annual change to building price index – general construction

Source: ABS (2009b)

Building price indices for the building and non-building construction[1] sectors are shown in Figure 21.4. In the case of Queensland and Australia, the indices for non-building construction grew by average

[1] 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 (not elsewhere classified) 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.

rates which were comparable with those for building construction. All indices outstripped inflation which averaged 3.4% per annum in Queensland and 3.2% per annum nationally which is detailed in Figure 21.5.

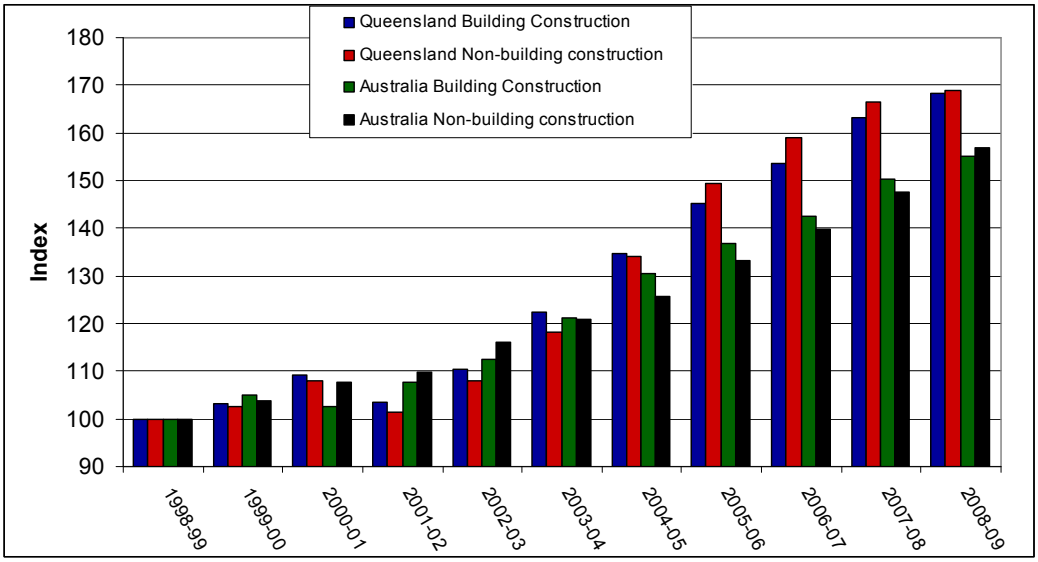


Figure 21.4 Building price index – building construction and non-building construction sectors, Queensland and Australia

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

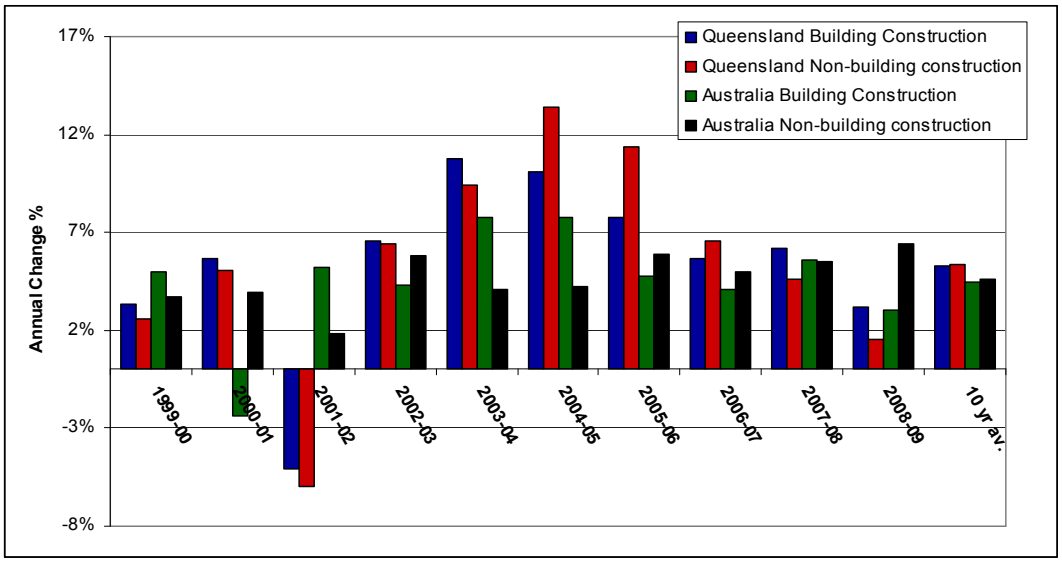


Figure 21.5 Average % change in building price index – building construction and non-building construction sectors, Queensland and Australia

Source: ABS (2009b)

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. Australian Bureau of Statistics data also indicates that wage increases were 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 indices across centres in the gas pipeline study area and the Brisbane index in each case. The statistics show that the costs of living in the study area compared to Brisbane varies across categories and urban localities. Based on the 'all items' index, costs were lower than in Brisbane in all centres in the gas pipeline study area.

When housing costs are excluded from the index, costs are broadly comparable with those for the Brisbane index. There were no centres which had indices for specific categories that were consistently higher or lower than those for the Brisbane index. Taking each centre in turn, the indices which varied by more than 5% from the Brisbane index were as follows:

- Biloela – food (94.6), housing (82.9) and transportation (94.7)
- Gladstone – food (107.9), clothing and footwear (94.4) and housing (83.0).

Health, education and communication were marginally more expensive in all centres and clothing and footwear was relatively more expensive in Biloela. In contrast, housing, transportation, and financial and insurance services were generally less expensive in the gas pipeline study area than in Brisbane, as shown in Table 21.5.

Table 21.5 Regional price index, May 2006

Category	Biloela	Gladstone	Brisbane
Food	94.6	107.9	100.0
Alcohol and tobacco	99.0	97.6	100.0
Clothing and footwear	104.9	94.4	100.0
Housing	82.9	83.0	100.0
Household contents and services	104.4	95.4	100.0
Health, education and communication	100.7	100.4	100.0
Transportation	94.7	96.8	100.0
Recreation	100.7	100.2	100.0
Financial and insurance services	95.9	95.6	100.0
All items	95.0	95.8	100.0
All items less housing	98.2	99.3	100.0

Source: OESR (2006)

21.3.2 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 gas fields than the SD data. The extent of the available labour force depends on a number of factors, including a range of demographic characteristics such as age and workforce participation rates. Comparing the workforce size against the population aged between 15 and 64 years indicates that the workforce participation rate for the gas pipeline study area (excluding Gladstone) was 89.9% in 2006. This was significantly

higher than the Queensland participation rate of 66.3%, which indicates that that it may be very challenging to source a local labour force.

Employment in the region of the gas pipeline study area is characterised by the dominance of the agricultural, mining and manufacturing sectors. In 2006, the SLA with the strongest agricultural sector (by employment contribution) was Taroom SLA at 54.2%. Banana SLA had a strong mix of agricultural (15.3%) and mining (17.4%) employment, while Calliope Part B SLA had a strong mix of agriculture (15.4%), manufacturing (15.3%) and construction (10.0%) employment.

The unemployment rates for pipeline SLAs between March 2001 and March 2009 are illustrated in Figure 21.6. The unemployment rate decreased in all SLAs between the March quarter 2001 and March quarter 2007 and then increased in Banana and Calliope Part B SLAs to the March quarter 2008. Between March 2008 and March 2009, the unemployment rate in Calliope Part B and Taroom SLA decreased marginally, whilst Banana SLAs rate increased slightly.

In comparison to the two other SLAs, Taroom had a significantly lower unemployment rate (at just 0.4%) which was one of the lowest rates in Queensland. As at the March quarter 2009, Calliope Pt B (5.5%) was the only SLA to record an unemployment rate higher than the Queensland average of 4.5%.

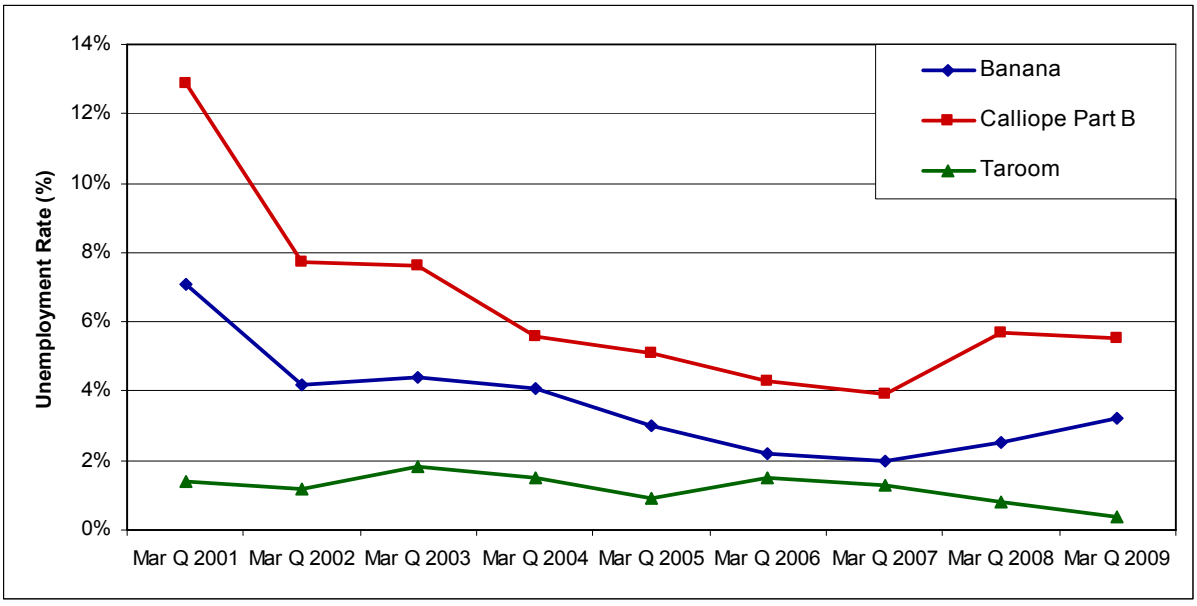


Figure 21.6 Unemployment rate, gas pipeline SLAs – 2001 to 2009

Source: Department of Education, Employment and Workplace Relations 2009

Key industries

The gas pipeline study area and surrounds have some of the best grazing, farming and irrigation land in the state, having a diversity of soil types suitable for producing a variety of crops. Banana Shire Council comprises much of the gas pipeline study area. Major industries in the Shire are coal mining, beef production, power production and cropping. It is rich in natural resources and has extensive undeveloped coal deposits that will be utilised in the coming years in the Theodore, Moura and Baralaba areas. Coal, methane gas and other coal by-products are used in power production.

The Callide Power Station is the largest power generator in the region. It produces 1720MW of electricity which is approximately 16 % of Queensland's total installed electricity generating capacity. Meat processing is another key industry in the gas pipeline study area. The Biloela meatworks is the

third largest in Queensland and exports throughout Australasia. Mineral resources mined in the region include gold and coal. The development of Cracow Gold in 2005 has been an important contributor to some of the smaller communities in the region and is responsible for the production of 300,000 tonnes of ore and treatment of 100,000 ounces of gold per annum.

A number of infrastructure and industry developments have been proposed for the region including:

- The Nathan Dam Project, which is planned to be completed in 2015. The Queensland Government's project proponent, SunWater, is in the process of completing environmental impact studies. Water from the dam will be transported via a new pipeline to mines and power stations in the Surat Basin, potentially extending as far as Dalby. Water will also be released downstream to mines in the South East Bowen Basin, to customers in the Dawson Valley Water Supply Scheme, and as required to meet critical urban supply needs in the lower Fitzroy Basin and other parts of regional Queensland
- Energy Park Industrial Area that is being developed adjacent to the Callide Power Station
- Expansion of meat processing and related industries
- Surat Basin Inland Rail Project. Approximately 210km long, the rail line will start from Wandoan and join the existing Moura-Gladstone Line, near the township of Banana, to allow transport of coal by rail to Gladstone. It will export coal to the proposed Wiggins Island Coal Terminal. Australian Transport and Energy Corridor Pty Ltd (ATEC), Xstrata Coal and QR are all key players in the construction of the railway.

Key infrastructure

The gas pipeline study area has easy access to the cities of Rockhampton and Gladstone in the north and the regional centres of Dalby and Roma to the south. It has rail and road links north to Gladstone and Rockhampton, and is serviced by the Leichhardt, Dawson and Burnett Highways, which provide roads links to Brisbane and the Western Downs and Maranoa Regional Council areas. In addition to these, the region has air services Sunday to Friday, into the Thangool Aerodrome near Biloela and multiple daily flights out of Gladstone Airport to the north, south and west. Public road transport is provided by Greyhound Australia (operated by Kynoch Coaches) and Callide Coaches.

Relevant government policies and strategies

The Queensland Government, local councils, and government agencies have been active in planning for the expected growth in the regions 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 the development potential of the region is maximised. The strategies have been developed to ensure the Gladstone region and Surat Basin, including the area traversed by the pipeline, has the appropriate infrastructure, facilities and services in place to underpin and facilitate development.

These include:

- 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 enhance 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
- Darling Downs South West Queensland Surat Energy Action Plan which is being developed by the Department of Employment, Economic Development and Innovation in consultation with local industry groups, mines and mining services and other supply companies. The Action Plan will identify and market regional opportunities, grow supply chain capability and strengthen the foundations for growth through the promotion of infrastructure planning and investment.

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 Biloela and Miles where land and dwelling stocks and changes in property stocks tend to be relatively smaller.

To determine the relative land value by use in the gas pipeline study area, land was classified into four broad categories, these being:

- Agricultural uses
- Residential uses
- Commercial uses
- Industrial uses.

Sales data is presented for each of the former local government areas contained within gas pipeline area for the period from 2004-05 to 2008-09. Notes that these former LGA's have been used as the most recent property data available reports using these areas.

Agricultural uses

Within the gas pipeline area there were 410 agricultural land sales between 2004-05 and 2008-09, and 70% of these were in Banana. The number of sales in the gas pipeline area peaked at 97 sales in 2005-06, with Calliope (26 sales) and Taroom (12 sales) also recording peak sales volumes in the same year.

In this area, median values varied between A$0.03/$m^2$ and $0.51/ m^2. Banana recorded the highest value per square metre over the period at A$0.30/ m^2, and was the only area to record a sales value

above the gas pipeline area average. Given the high number of sales it is possible to show median sale prices for all areas as well as for the gas pipeline study area as a whole.

Overall, median sale values were higher in the gas pipeline study area compared to the gas fields study area.

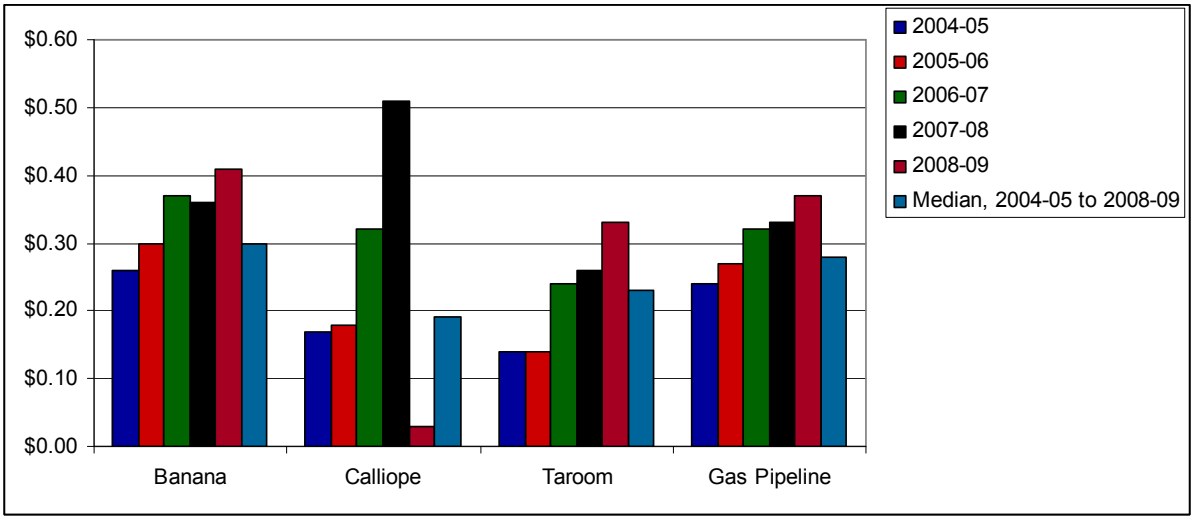


Figure 21.7 Median sales prices per square metre for agricultural land in gas pipeline study area

Note: Data was extracted in August 2009.
Source: Property Data Solutions (2009)

Commercial uses

Within the gas pipeline area there were 138 commercial sales between 2004-05 and 2008-09. Banana recorded the highest sales volume (74 sales). There were considerably fewer commercial sales in this area than either agricultural or residential sales. Gladstone recorded a substantially higher median value per square metre (A$417.59/ m^2) than Banana (A$181.47/ m^2), Calliope (A$160.62/ m^2) and Taroom (A$44.28/ m^2). Within the area median values peaked in 2007-08 in Calliope, Gladstone and Taroom and in 2008-09 in Banana. Median values were typically higher for commercial sales than residential sales.

Industrial uses

Within the gas pipeline area there were 116 industrial sales between 2004-05 and 2008-09, almost half of which were located in Banana SLA (57 sales). The median value of industrial sales per square metre peaked in the gas pipeline area in 2008-09 at A$169.55/ m^2. Within the gas pipeline area, the median value of industrial land sales per square metre peaked in 2004-05 in Calliope (A$111.31/ m^2), 2005-06 in Taroom (A$35.93/ m^2), 2007-08 in Gladstone (A$194.68/ m^2) and 2008-09 in Banana SLA (A$169.55/ m^2). Figure 21.8 illustrates median price per square metre for industrial property in the gas pipeline study area and the number of annual sales in the years 2004-05 to 2008-09. The median price for 2008-09 is not shown in the figure below due to the low number of sales (4) which could introduce bias into the reporting.

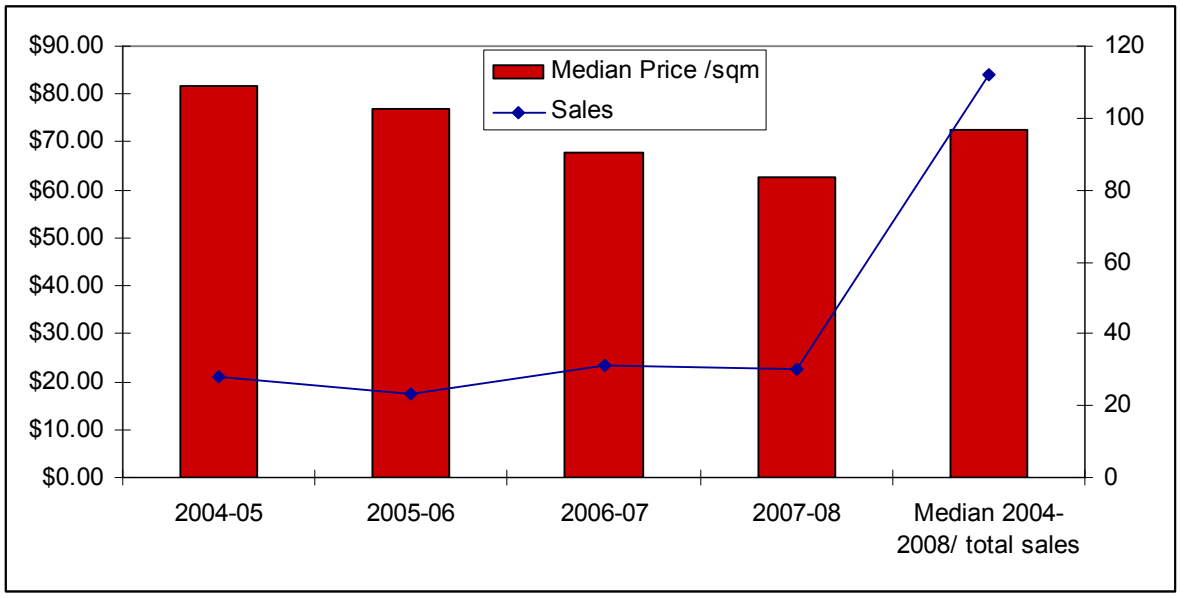


Figure 21.8 Number and median value of sales per m^2 in gas pipeline study area – 2004-05 to 2007-08

Note: Data was extracted in August 2009.
Source: Property Data Solutions (2009)

Summary

In the past five years, the gas pipeline area consistently recorded higher per square metre values than the gas field area across all land use types although this was predominantly due to high prices in Gladstone. The analysis highlights that commercial and residential land zonings attract the highest per square metre values, particularly in Gladstone, Calliope and Banana. These areas also achieved the highest median industrial land prices per square metre.

Residential uses

There were 5,420 residential sales within the gas pipeline region between 2004-05 and 2008-09, comprising:

- 1,891 sales in the former Banana LGA
- 1,531 sales in the former Calliope LGA
- 1,893 sales in the former Gladstone City LGA
- 105 sales in the former Taroom LGA.

Residential sales in Banana, Calliope and Gladstone were significantly lower in 2007-08 and 2008-09 than in previous years. They peaked in 2004-05 in Banana (479 sales), in 2005-06 in Gladstone (592 sales) and in 2006-07 in Calliope (511 sales).

Median sales prices for houses for the 12 months to October 2009 and the percentage of growth over the last 12 months and 5 years are presented in Table 21.6. For the period 2004 to 2009 the greatest increase in median house prices in the gas pipeline study area was in Miles with 210%, which is significantly greater than the national average of 11.7% over the same period. Biloela has also experienced considerable increases the median house price, although prices have stagnated somewhat over the past 12 months. As discussed in Volume 4 Chapter 21, Gladstone has experience

negative housing growth over the last 12 months, associated with the global financial crisis and temporary drop in the resource sector, leading to job losses.

Table 21.6 Median sales prices for houses, gas pipeline urban localities (2009)

Urban locality	Median sales price houses, 2009 (A$)	12 month growth to October 2009(%)	5 year growth to October 2009 (%)
Biloela	298, 000	2.8	148.3
Gladstone City	355,000	-2.7	77.5
Miles	247,500	13.3	210.4
Wandoan	240,000	29.7	Na

Source: RP Data (2009)

The median price of currently advertised properties in Theodore is A$250,000, with new properties advertising between A$355,000 and A$425,000.

Rental prices

The latest data available by SLA is 2006 Census data (see Figure 21.9). It should be noted that this data is now three years out of date, and the RP Data information available for urban localities below, provides a more realistic picture of the current rental price situation in the pipeline communities as it is based on current advertised rental rates.

In 2006, average weekly rent payments were significantly lower in the gas pipeline SLAs compared to Queensland (A$200 per week), ranging from A$56 per week in Taroom SLA to A$129 per week in Banana SLA.

The increase in average weekly rent payments between 1996 and 2006 within the amalgamated gas pipeline SLAs (78.8%) was higher than the national increase (55.3%) for the same period. Taroom was the only SLA to record a drop in the average weekly rent, falling from A$58 per week in 2001 to A$56 per week in 2006. However, it should be noted that this increase was off a very low base in comparison to the Brisbane average.

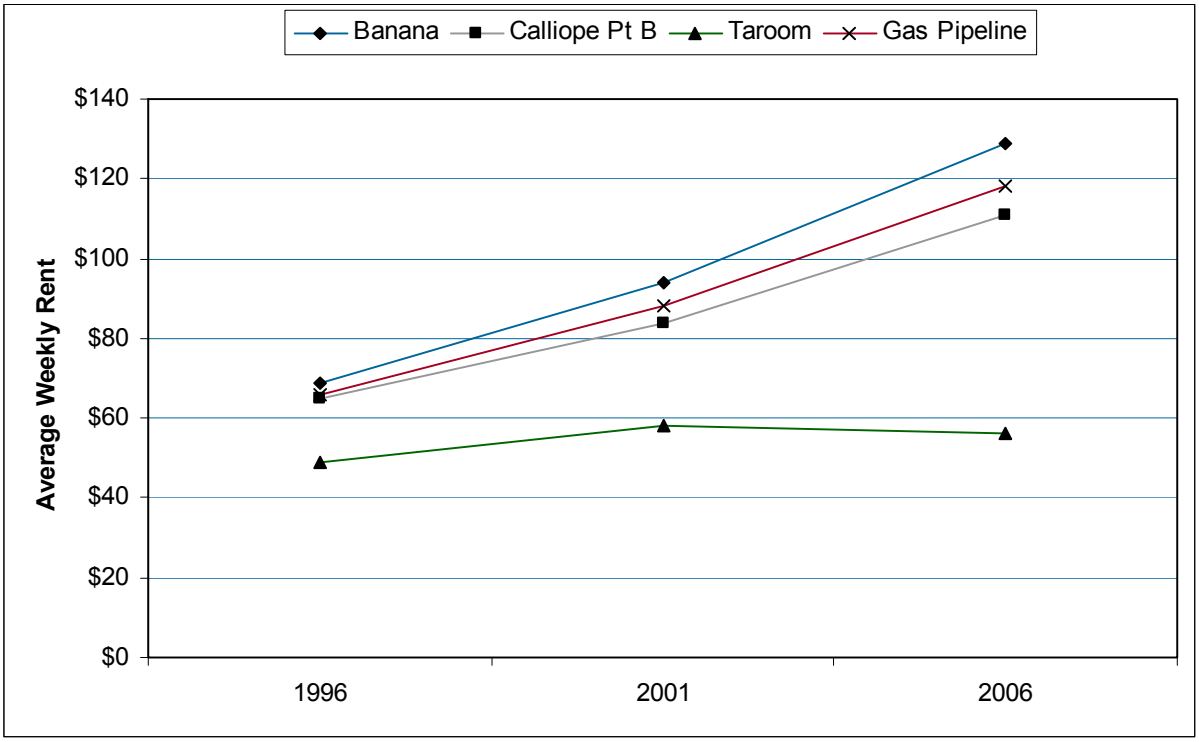


Figure 21.9 Average weekly rent, gas pipeline SLAs, 1996 to 2006 (A$)

Source: ABS (1996), ABS (2001) and ABS (2006)

More recent data is available for some of the towns within the pipeline area. Table 21.7 shows the weekly advertised rent as at August 2009 for Biloela, Gladstone and Miles. These figures are significantly higher than those reported through the 2006 Census and are representative of an increasingly expensive rental market which has impacts on rental affordability. Vacancy rates for properties are currently very low. As at December 2009 there were four properties for rent in Theodore ranging from A$160 to A$300 per week and one property available in Wandoan which is advertised for A$180 per week. Currently, there are no properties available for rent in Taroom, and as such it is not possible to provide information on average advertised rental prices. Vacancy rates in Miles and Biloela are also low, with only 14 and 30 properties advertised in December 2009.

Table 21.7 Weekly median advertised rent of gas pipeline urban localities

Urban locality	Weekly median advertised rent (A$)
Biloela	290
Gladstone City	345
Miles	220

Source: RP Data (2009)

RP Data rent figures were not available for the towns of Wandoan, Taroom and Theodore.

21.4 Economic impact assessment

This section of the report 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 impacts can be found in the social impact management plan in Volume 3 Chapter 20.

21.4.1 Identification of potential economic impact categories

Economic impacts have been classified according to the categories presented in Table 21.8. Each of the impact categories are explained in the context of potential implications of the Project on the economic environment.

Table 21.8 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	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 gas pipeline 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 Australia Pacific LNG 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 (refer to Section 21.2). The outcome of this was used to identify any further impacts which may come about as a result of changes to the economy.

21.4.2 Economy wide impacts

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 facility. This acknowledges the relationship between the Project's three elements. This is a summary of the estimated contribution of the Project to the economy. A more detailed analysis and discussion is available in Volume 5 Attachment 46.

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 coal seam gas 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

The Project is expected to impact on the Australian economy both directly and indirectly during the construction of its various elements. The direct effects relate to the additional employment and output in the construction industry that are expected to occur as a result of the construction of the Project. Figure 21.10 shows the direct employment associated with the three project elements during the construction phase.

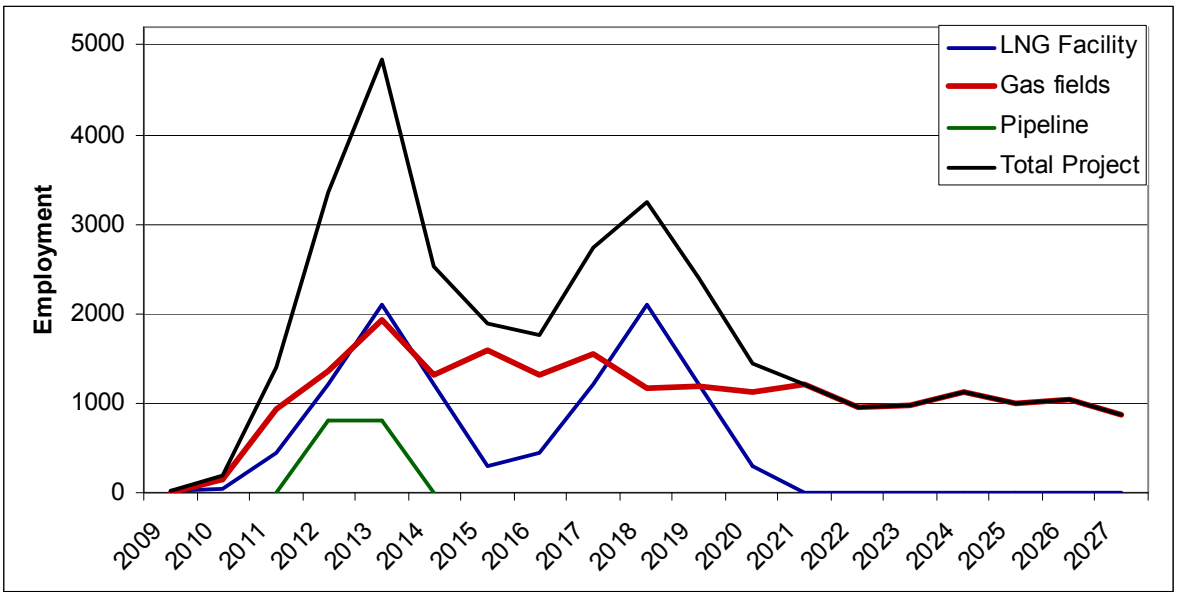


Figure 21.10 Project construction workforce 2009-2027 (direct only)

Source: Australia Pacific LNG

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

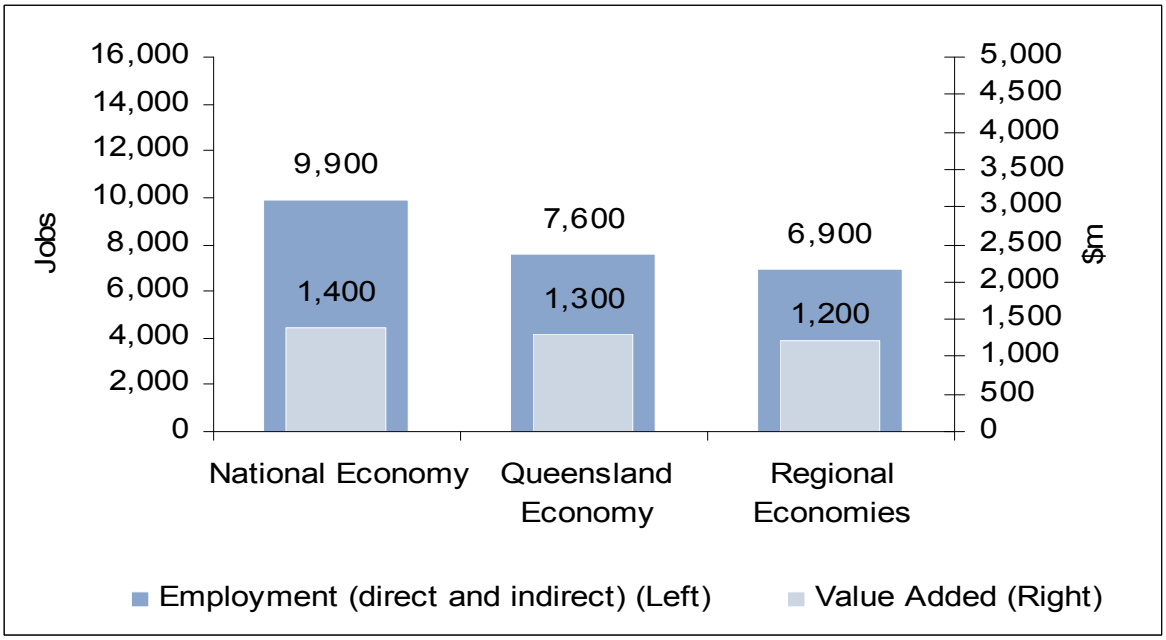


Figure 21.11 Average economic impacts of the construction phase

Source: KPMG Econtech (2010)

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 phase of the Project is expected to directly contribute an average of approximately A$980 million 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 contribution 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 also impact on 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.

Australian impact

At the national level, real Gross Domestic Product (GDP) is expected to be approximately A$1.3 billion (0.1%) 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. Figure 21.12 below illustrates the impacts of the Project on the national economy.

The expected increase in real GDP will also facilitate higher real national income as a result of the Project. The higher real income would be expected to 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 21.12. This illustrates that during operation of the Project, private consumption is estimated to be higher by about A$600 million on average in each year and annual investment would be about A$535 million higher.[2]

[2] This estimate is based on annual real household consumption figures for the 2007-08 year by the ABS.

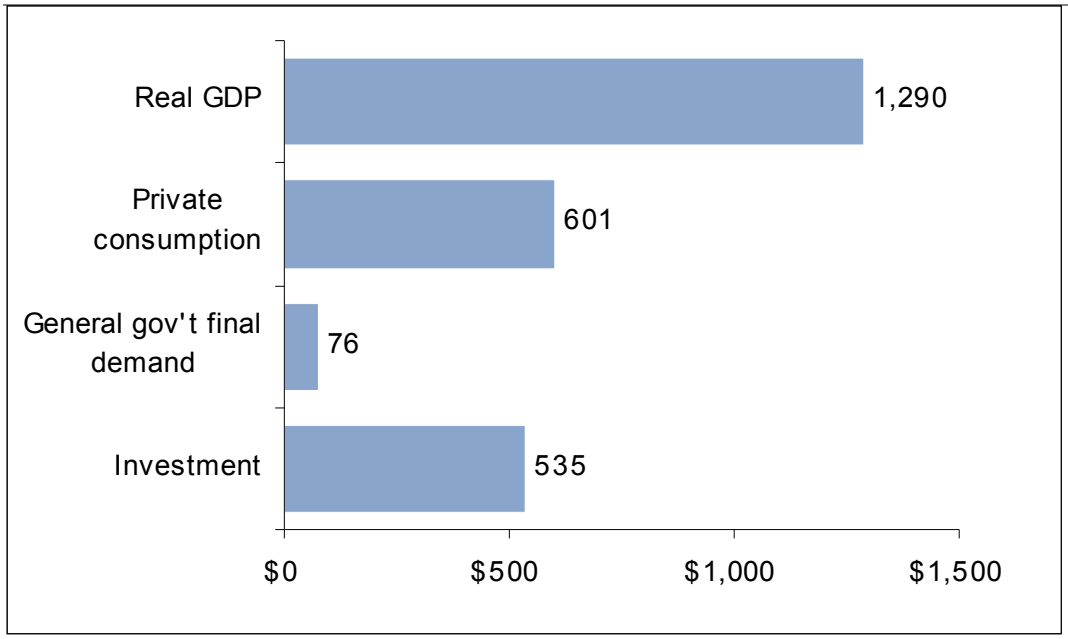


Figure 21.12 Annual operation scenario national macroeconomic effects (A$m in 2006-07 prices)

Source: KPMG Econtech (2010)

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 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 (e.g. 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.

Queensland impact

Once the Project is fully operational, it is expected to contribute an increase of A$2 billion (0.9%) in Queensland's gross state product 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 mining (including CSG/LNG) industry. 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 gross state product and employment, the Project will also contribute to Queensland state revenue through royalties and taxes. The Queensland Government (Department of Infrastructure and Planning 2009) has estimated that royalty receipts associated with a 28Mtpa LNG industry would reach A$850 million by 2021. Using this rationale, at peak production the Project could generate royalty revenues for the State of up to A$485 million per annum.

Regional impact

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) by 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.

Figure 21.13 below presents the estimated production effects on the regional economies of Mackay-Fitzroy-Central West and Darling Downs South West regions in Queensland. It presents the percentage increase in output that can be contributed to the Project for each industry. This figure represents the average annual impacts the Project has on the economy over its lifetime.

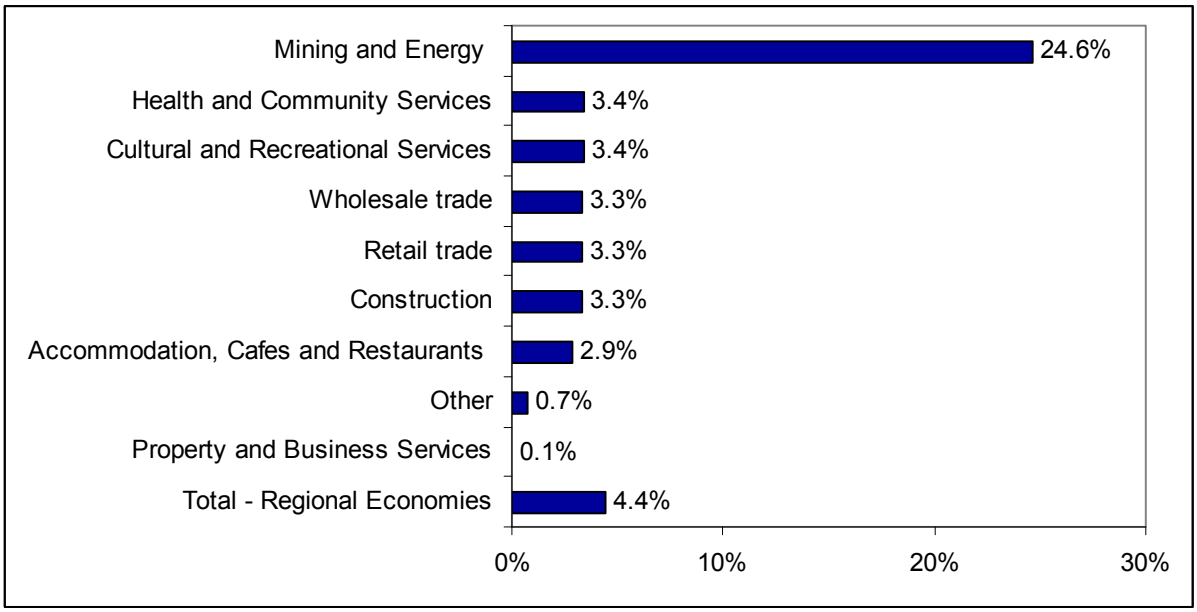


Figure 21.13 Regional industry production effects during operation (% deviations from baseline)

Source: KPMG Econtech (2010).

The figure shows that 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 expected to have a significant direct positive contribution to the mining industry[3]. 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.

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

As these figures demonstrate, the Australia Pacific LNG Project is anticipated to provide significant economic benefits and make a substantial 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 estimated to be approximately A$35 billion (nominal dollars) to be carried out over the initial10 years of construction between 2010 and 2020. 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 the price of building materials due to strong demand particularly in local areas in the short term, potentially reducing the willingness of developers 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 expected short term local cost increases, modelling for this assessment shows that in the long term, at a national level, the Project is expected to contribute to a 0.3% decline in the CPI relative to the base case, while the cumulative effect of the projects in the region will 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 cheaper 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 (0.3% increase in pre-tax wages) 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 likely 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 expected to experience increases in gross operating surplus due to the capital injection in those industries, as a

result of the Project. In contrast, industries that are not gas-related may experience a small loss in gross operating surplus 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 gross operating surplus of all industries 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 result in 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 is the possibility that there will be a small Queensland wage premium to develop from the Project due to increased demand for labour within Queensland, 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.

21.4.3 Local and regional impacts

The assessment of the Project's impact on the gas pipeline's local and regional economies takes into consideration the potential impact of the Project to the gas pipeline 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 gas pipeline specific impacts.

Income and affordability

Cost pressures

As outlined in Section 21.3.1 and shown in Figure 21.14, in 2006, the all items regional price index for Biloela and Gladstone was lower than in Brisbane. When the sub-categories are analysed the price of food was higher in Gladstone than for Brisbane in 2006. Clothing and footwear prices were around 3% to 4% higher than Brisbane in Biloela, and in all areas the price of health, education and communication services were in line with or above the price in Brisbane. Housing was somewhat cheaper in all regions, and for most other items (including alcohol and tobacco, household contents and services, transportation, recreation and financial and insurance services) prices were below the Brisbane average.

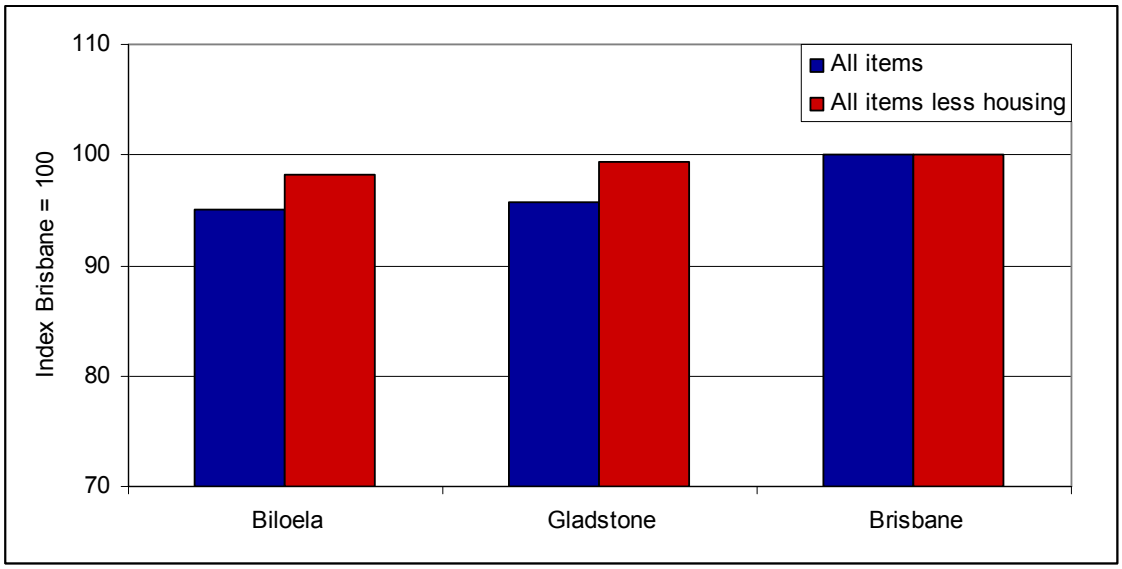


Figure 21.14 Regional price index, May 2006, Brisbane = 100

Source: OESR (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 on prices in the region is likely to be larger when the cumulative effects of the other projects are taken into account.

Property prices

The impact on property prices associated with the Project will differ during the construction and operational phase due to the different strategies used to house employees. The impact of the Project on residential property prices during the construction and operational scenarios of the gas pipeline development has not been quantified for a number of reasons. Firstly, there are a wide variety of factors, outside the control of Australia Pacific LNG which make forecasting the change to house prices difficult to do with confidence. Secondly, there have been no projects of a similar nature undertaken in the gas pipeline region which could be used as a proxy to help determine the potential impact of the Project on the communities in the gas pipeline study area. As such, the analysis of impact has been presented as a qualitative discussion.

Construction

Construction of the gas pipeline is expected to have little direct impact on the housing market in the region. It is anticipated that a peak construction workforce in the region of approximately 800 people will be required to construct the pipeline. This workforce will be accommodated in temporary accommodation facilities established near to the gas pipeline easement and as such there is expected to be little direct interaction from these workers with the region's housing market.

Operation

The gas pipeline will be largely self-contained when it is fully operational and will directly employ only 20 people locally. The gas pipeline will be operated from each end of the pipeline and as such there

will be no requirement to employ personnel to work along its length. Due to the small nature of the workforce, the impact on the property market is expected to be minimal.

Cumulative impact to property prices

While the impact associated with the Australia Pacific LNG Project is expected to be minimal this impact could be compounded by the cumulative effect of multiple developments in the region. The housing market in Miles has seen the greatest annual average increase in housing prices the region. Miles had an average annual growth rate of 28.6% in the average house price from 2004 to 2008, significantly larger than the 11.7% per annum for Australia as a whole. This indicates Miles is already facing strong demand and any cumulative increase in workers seeking accommodation could lead to increase housing prices however as noted this is more likely to be associated with the construction and operation of the various gas fields projects rather than gas pipelines.

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 number of temporary accommodation facilities that can be used, particularly in periods of peak housing demand
- The extent to which some of the temporary accommodation facilities 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 21.3.2) 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. This could lead to low income families being unable to rent through the private rental market, and contribute to higher rates of housing stress. The impact during the construction phase is expected to be minimal as the majority, if not all workers will be housed in temporary accommodation facilities and the construction period is relatively short. Similarly the impact associated with the operational phase is

expected to be low due to the low number of employees (20 in total). In December 2009 there were approximately 46 properties available to rent in communities in Biloela and Miles and over 200 rental properties in Gladstone which would be more than sufficient to house the projected operational workforce who may move into the area.

Commercial and industrial property prices

The Project has the potential contribute to an increase in commercial and industrial property prices as a result of higher demand. This demand is likely to come from new businesses being established in the gas pipeline study area, in response to higher demand for goods and services associated with an increased workforce and the requirements of the temporary accommodation facilities. 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 dampen economic growth in the region.

Given the shorter construction period of the gas pipeline in comparison to the LNG facility and gas fields and the minimal operational requirements, it is not expected that there will be as many new businesses developing and/or expanding. As such, demand will be softer and as a result impact on prices will be weaker. The development of the new industrial estate adjacent to the Callide power station will also respond to any increased demand.

Demand on infrastructure

The Project may contribute to pressures on access to health services, recreational and cultural facilities and services, childcare places, educational places, and policing and emergency services from increased demand as a result of the anticipated population increase. This has the potential to have an impact on 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 3 Chapter 20.

In addition to the demand on social infrastructure discussed in this section, the impact of the Project on other infrastructure is discussed in Volume 3 Chapter 11 for water, Volume 3 Chapter 16 for waste and Volume 3 Chapter 17 for traffic. Table 21.9 shows the facilities and services available in the gas pipeline study area.

Table 21.9 Social infrastructure facilities and services available – gas pipeline study area

Type of infrastructure	Availability in gas pipeline study area
Hospitals	Gladstone Hospital Biloela Hospital Theodore Hospital
Health care services(a)	Taroom Health Services(a) Wandoan Outpatients Clinic(b)
Childcare (Childcare places per 100 children aged 0-4)	Biloela – 0.7 Theodore – 3.0 Gladstone – 0.5
Police	Seven police stations within the region
Emergency services	Six ambulance service offices Five fire and rescue service facilities

a. Does not provide drug and alcohol, mental health or nursing home services
b. Does not provide drug and alcohol, nursing home, or long stay and respite care 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 21.4.2 and Table 21.10 and highlight that there may be an increase in the demand for both health and education services.

Table 21.10 Indicators of increase in regional demand for education, health and community services in project region – Project's operational phase

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 associated with 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 place greater demand on infrastructure and services.

It is anticipated that increased demand on infrastructure and services as a result of the Project will be responded to, and managed by, the appropriate government agencies. When the Blueprint for Queensland's LNG Industry[4] was released in 2009, the Queensland Premier noted that royalties received from the CSG/LNG industry would be used to provide infrastructure such as hospitals and schools.

The cumulative impact of multiple projects on the regions which the Project is located is shown in Table 21.11. These estimates indicate there will be a significant increase in the demand for employment in both the education and health and community services sectors due to the large number of projects in the region, which likely indicates sizeable pressure on current services.

Table 21.11 Indicators of increase in regional demand for education, health and community services in project region

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).

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

The Gladstone 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 and in other communities along the gas pipeline route such as Miles, Wandoan and Biloela.

Employment and training

Skills demand during construction of the gas pipeline

The Project will increase the demand for employment in the economic regions traversed by the gas pipeline, 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 21.12 shows the estimated maximum change in employment in different industry sectors in the Mackay-Fitzroy-Central West Queensland region during the construction phase of the Project.

Table 21.12 Maximum employment increase during construction - Mackay-Fitzroy-Central West Queensland region

Industry sector	Change in employment in construction phase	
	Number[1]	Per cent
Construction	2,200	8.8%
Cultural and recreational services	100	4.8%
Retail trade	800	4.7%
Finance and insurance	200	4.5%
Accommodation, café's and restaurants	200	4.2%
Health and community services	500	4.0%
Personal and other services	200	3.9%
Wholesale trade	400	3.9%
Education	500	3.8%
Communication services	100	2.8%

Rounded to the nearest one hundred employees
Source: KPMG Econtech (2010).

In the Darling Downs-South West Queensland area, forecasts indicate that the sectors with the largest increases in demand for employment are expected to be the construction, cultural and recreational services, retail trade, finance and insurance, wholesale trade, health and community services, and accommodation, cafés and restaurants sectors. This is shown in Table 21.13.

Table 21.13 Maximum employment increase during construction - Darling Downs-South West Queensland region

Industry sector	Change in employment in construction phase	
	Number*	Per cent
Construction	1,100	8.8%
Cultural and recreational services	100	5.6%

Finance and insurance	300	5.2%
Retail trade	500	5.1%
Health and community services	600	4.7%
Accommodation, cafés and restaurants	100	4.7%
Wholesale trade	300	4.6%
Personal and other services	200	4.6%
Education	500	4.5%
Communication services	100	3.1%

* Rounded to the nearest one hundred employees
Source: KPMG Econtech (2010).

During the construction phase of the gas pipeline for the Project, the construction workforce will average around 800 staff over the period during 2012 and 2013.

Because of the very high employment and labour force participation rates in the gas pipeline study area, the construction of the gas pipeline could potentially contribute to skill shortages in industry sectors which experience high demand for additional labour, if labour is sourced locally. This is particularly the case given that there will be a number of pipeline projects in close proximity to the gas pipeline study area. This is expected to create an estimated increase in demand for labour of 14% in the Mackay-Fitzroy-Central West Queensland region and 19% in the Darling Downs-South West Queensland area. The cumulative effect of this (which has not been modelled) will be to compound the skill shortages.

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. These areas are detailed in Table 21.14.

Table 21.14 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 Project

The Project will increase the demand for labour, both directly and indirectly, during the operation phase. Forecasts indicate that the sectors with the largest increases in demand for employment are anticipated to be the mining (including CSG/LNG), construction, retail trade, education, and health and community services sectors. However, in the context of the gas pipeline's operation, it is expected that skills shortages directly related to the Project will be minimal due to the small workforce required. During the operation phase of the gas pipeline element of the Project, the operation workforce will be relatively small, at only 20 workers. The share of workers by profession is detailed in Figure 21.15

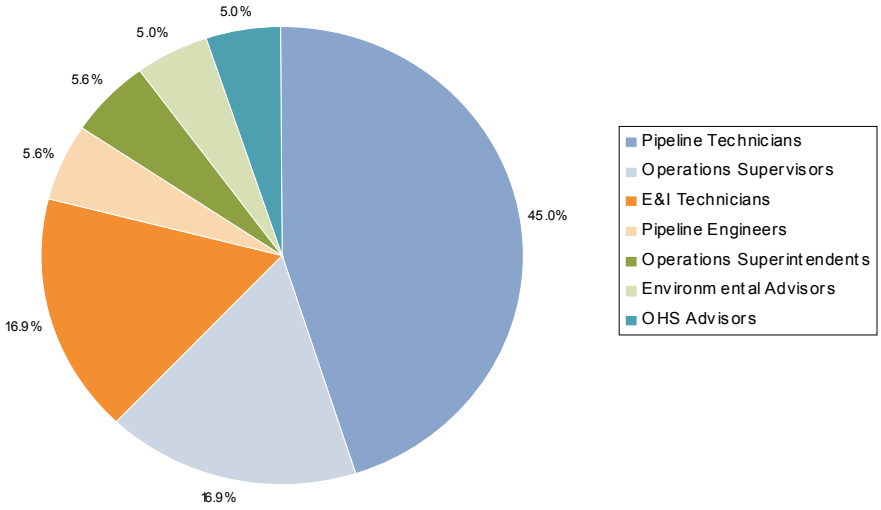


Figure 21.15 Workers required, by profession, during operation of the gas pipeline – share of total required 2009 to 2020

Source: Australia Pacific LNG

Local business employment

Given the short term nature of construction (18 months) and the low size of the operational workforce (20 people) it is not anticipated the gas pipeline element of the Project will impact significantly on local business employment.

Cumulative impacts on local business employment

The pressures on local employment will however be magnified by the fact that there will be a number of new projects in the region. The pressures on employment arising from the cumulative impact of multiple projects in the region will be particularly strong due to the tight labour market conditions in the regions. The high number of jobs that will be available in Gladstone and the Western Downs associated with the various projects may encourage people to leave communities in the gas pipeline area to pursue these opportunities.

Workers entering traditional rural industries

The Project may contribute to a possible fall in the number of students interested in entering traditional rural employment roles, partly due to the increased availability of jobs in other industry sectors, in

particular mining (which includes CSG/LNG industries), and partly due to potentially more attractive salaries available in other industry sectors.

Modelling undertaken for this assessment indicates that the agriculture, forestry and fishing industry sector may see a fall in employment of around 130 persons (0.6%) in the construction phase of the Project (spread over 10 years for gas pipeline and gas field development) and around 180 persons (0.8%) during the operational phase of the Project (spread over 30 years), a small proportion of which will be due to changes in land use, whilst the majority will likely be due to structural adjustment associated with changes in the exchange rate. During the operation phase, the cumulative impact will likely be larger, potentially reducing agriculture, forestry and fishing sector employment by around 490 workers (2.2%) in the Darling Downs-Central West Queensland region (spread over 30 years).

Australia Pacific LNG understands the key role that rural industries plays in the regional economy. The Queensland government is developing the Surat Basin Regional Development Plan which, in conjunction with the Blueprint for Queensland's LNG Industry will work towards minimising any unintended consequences associated with rapid growth of the LNG industry. Australia Pacific LNG is committed to working with the government and other CSG industry proponents to reduce the impact of the CSG/LNG industry on the rural sector.

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 anticipated that there will be increased demand for goods and services both directly (e.g. bread provided to temporary accommodation facilities, services to Project staff during the operational phase such as hairdressing etc) 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 national consumption of 0.1% (note that consumption data is only available at the national, not regional level).

Cumulative impact to 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. 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 may have an impact on the capacity for local businesses to attract and retain workers, particularly as a result of upward pressure on wages (that is 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% nationally. This is an overall increase and may differ from the actual increases experienced in individual sectors. Given the low number of operational workers, this impact is not anticipated to be significant.

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 gas pipeline study area, there is a chance 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.

Economic impact of the change to land use

Forecasts prepared for this assessment indicate that the agriculture, forestry and fishing industry value added for the Darling Downs-South West Queensland region will be A$5.7 million lower than the base case during the construction phase, which is equivalent to a 0.3% decline. During the operational phase, industry output is projected to be A$9.9 million lower, or 0.5%. The expected reduction in industry output for the agriculture, forestry and fishing industry is due to a range of factors, most importantly, structural adjustments associated with changes to the exchange rate which impact export industries such as agriculture to a greater extent than other industries (refer to Section 21.4.2). In addition to structural adjustment, the Project has the potential to impact industry output through a reduction in the quantity of agricultural land available for production purposes. This will only occur during the construction phase as land is taken out of production while the gas pipeline is constructed with many agricultural land uses able to resume after the pipeline has been constructed.

The gas pipeline development will result in the temporary disturbance of some cropping and grazing lands and the permanent removal of some land from agricultural use. The greatest economic impact is expected to be associated with the loss or disturbance of good quality agricultural land (GQAL). This is land capable of sustainable use for agriculture, with a reasonable level of inputs, and without causing degradation of land or other natural resources. It is important to note that while a considerable amount of land may be disturbed during the construction phase, the vast majority will be returned to productive use once the gas pipeline has been constructed. It is estimated that the construction of the gas pipeline will disturb approximately 1,067ha of GQAL. Following the completion of construction and associated rehabilitation activities, it is estimated that the development of the gas pipeline will remove from potential agricultural production in the order of 31ha of GQAL. This level of change of use is not expected to materially alter the land use balance in the gas pipeline area. Given that the land impacted by the pipeline will revert to its original use once operational, the economic impact associated with the change in land use is anticipated to be minimal.

The cumulative impact of multiple projects in the region would be to decrease the available agricultural land by somewhat more than the above estimates. This in turn would potentially have a larger negative impact on agricultural employment and production in the region. Forecasts indicate that during the operation phase, the cumulative impact of the projects will be to reduce agriculture, forestry and fishing sector employment by 2.2% in the Darling Downs-South West region, and to reduce output by 2.1% in the region.

The impact of the Project on farming activities will depend on the amount of land, the location of Project infrastructure relative to farming activities, the area and duration of the disruption or disturbance, the capacity to modify farming practice to accommodate Project infrastructure and the type of farming activities in the specific location. A detailed discussion of the impacts associated with changes in land use and associated mitigation strategies is provided in Volume 3 Chapter 6.

Costs associated with traffic infrastructure

The Project will contribute to increased traffic movements in the gas pipeline study area. Moreover, heavy vehicles and movement of equipment may lead to temporary, localised damage to road surfaces during the construction phase. This may lead to an increase in travel times particularly for

travel between towns in the gas pipeline study area, which may in turn increase the cost of living for households and businesses.

Traffic will be generated by the transportation of personnel, and trucks carrying construction materials during the construction phase of the Project. The impact of this will likely be largest in the gas pipeline region, as the construction activities will be relatively concentrated in the local region and will be undertaken over an 18 month to two-year period.

Further analysis and mitigation strategies regarding the impacts on traffic and transport infrastructure are provided in Volume 3 Chapter 17.

Impacts associated with other environmental factors

The Project could potentially impact on local businesses during the construction phase of the gas fields due a number of environmental factors such as noise and air quality although this impact is expected to be minimal. Site clearance, access road construction, pipeline installation and associated infrastructure and vehicle movements are likely to have a localised impact on both noise levels and air quality due to dust generation through the construction phase. This is discussed in Volume 2 Chapter 13 and Volume 2 Chapter 15. From an economic perspective, high dust levels have the potential to reduce agricultural output and hence land productivity although the mitigation strategies detailed in the aforementioned chapters are anticipated to reduce and adverse economic impacts associated with environmental factors such as air quality and noise.

21.4.4 Cumulative impacts of upcoming major projects including the Australia Pacific LNG Project

The Australia Pacific LNG 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 (including the Australia Pacific LNG Project) 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 21.2.2.

Australian economy

Once the 30 projects are fully operational, the national economy will 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 of around A$1.1 billion annually, on average.

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 would 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. 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 gross state product is expected to be A$6.9 billion higher on average each year (or 3.6 %).

As with the impact of the Australia Pacific LNG 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 the regional level, the projects at full operation are estimated to have the following impacts:

- In the Mackay-Fitzroy-Central West region the projects are estimated to lead to higher employment by an average of 15,400 jobs
- In the Darling Downs-South West region, the projects are estimated to lead to higher employment by an average of 39,300 jobs
- Mackay-Fitzroy-Central West's GRP is expected to be A$2.6 billion higher on average each year (or 10.0 %)
- Darling Downs-South West's GRP is expected to be A$5.2 billion higher on average each year (or 41.4 %) with the projects at full operation.

The primary cumulative economic impacts of the projects will be positive, leading to increased incomes, expenditure and employment. The Gladstone area, at the northern end of the gas pipeline study area will be a key beneficiary of the impacts on the Mackay-Fitzroy-Central West region, while the gas pipeline and gas fields' study areas will realise much of the economic gains associated with the Darling Downs-South West Queensland region. These impacts will create substantial employment opportunities in communities such as Miles, Chinchilla, Dalby and Roma, specifically in the mining, electricity, gas, water and construction industries.

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 and Darling Downs-South West economies. 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 will be key beneficiaries of the impacts.

21.5 Conclusion

21.5.1 Assessment outcomes

The Australia Pacific LNG Project is expected to have significant impacts on the local, regional, state and national economies. The Project represents a significant investment in value adding to coal seam gas 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 gross state product of approximately A$2 billion per annum, creating of an average of 9,000 jobs (directly and indirectly) each year in Queensland. Australia Pacific LNG is committed to sourcing inputs including labour, goods and services from the local and regional economies where practicable. For the regions which the gas pipeline traverses, the Project is anticipated to contribute to lead to an:

- Increase in employment (both direct and indirect) in the Mackay-Fitzroy-Central West region by around 4,100 jobs in the construction phase and nearly 3,000 jobs during the operational phase
- Increase in employment (both direct and indirect) in the Darling Downs-South West region by around 2,900 jobs in the construction phase and nearly 6,000 jobs during the operational phase
- Increase in value added annually by A$803 million in the construction phase, and by A$450 million during the operational phase in the Mackay-Fitzroy-Central West region
- Increase in value added annually by A$441 million in the construction phase, and by A$900 million during the operational phase in the Darling Downs-South 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 the social impact management plan in Volume 3 Chapter 24.

21.5.2 Commitments

To manage potential impacts of the Project on the local and regional economic environments, Australia Pacific LNG has 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 the social impact assessment in Volume 2 Chapter 20.

Income and affordability

Australia Pacific LNG will:

- Provide temporary accommodation facilities for non-local construction staff and contractors, and consult with stakeholders during the site selection process for these facilities

- Mitigate pressure on housing affordability during gas fields operations, temporary accommodation will be provided for personnel wishing to relocate until such time as housing stock becomes available
- Work through committees established under the Queensland Government's Sustainable Resource Communities Policy to identify housing market issues, forecasts and possible responses
- 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 (e.g. through the Community Skills Scholarship program)
- 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 EnergySkills 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:

- Implement CSG/LNG gateway programs with high schools in the region, in partnership with providers such as the Queensland Minerals and Energy Academy, to promote career opportunities and facilitate employment in the CSG/LNG industry
- Expand competency based training and skills development programs for production and process plant operators, including further development of the dedicated training facilities at the Peat gas processing facility near Wandoan
- 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.

References

Australian Bureau of Statistics (ABS) 1996, *Census Data*, Commonwealth Government of Australia, Canberra.

Australian Bureau of Statistics (ABS) 2001, *Census Data*, Commonwealth Government of Australia, Canberra.

Australian Bureau of Statistics (ABS) 2006, *Census Data*, Commonwealth Government of Australia, Canberra.

Australian Bureau of Statistics (ABS) 2007, *Australian Standard Geographical Classification (ASGC), July 2007*, catalogue number 1216.0, viewed 5 December 2008, <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/1216.0Jul%202007?OpenDocument>

Australian Bureau of Statistics (ABS) 2009a, *Labour Price Index, Australia*, cat. no. 6345.0, Australian Bureau of Statistics, Canberra.

Australian Bureau of Statistics (ABS) 2009b, *Producer Price Indexes, Australia*, cat. no. 6427.0, Australian Bureau of Statistics, Canberra.

Department of Education, Employment and Workplace Relations 2009, *Small Area Labour Markets*, March 2009, Australian Government, Canberra.

Energy Skills Queensland 2009, *Part A – Workforce Planning Report to inform the Workforce & Competency Development Strategy Plan for the Queensland Coal Seam Gas / Liquefied Natural Gas Industry*, Confidential Draft Report, p. 18.

KPMG Econtech (2010) *Australia Pacific LNG Project: Economic Impact Assessment,* report prepared for Australia Pacific LNG.

MMA (2009), *Queensland LNG Industry Viability and Economic Impact Study,* Department of Infrastructure and Planning, Brisbane.

Office of Economic and Statistical Research (OESR) 2006, *Index of Retail Prices in Regional Centres*, Queensland Health, Queensland Government, Brisbane.

Office of Economic and Statistical Research (OESR) 2008, *Experimental Estimates of Gross Regional Product,* Queensland Office of the Government Statistician, Queensland Government, Brisbane.

Property Data Solutions 2009, *PDS Live online database*, available by subscription.

RP Data 2009, *Suburb Profiles*, viewed 20 December 2009, <http://reports.rpdata.com.au/cgi-bin/vgmsg/RP_Reports/subprofile/rprephome.p?type=1>