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G.9 Economics

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G.9.1 Current and Completed Projects

Appendix G.9.1 Current and completed projects

- **Table G.9.1 Current projects**

Project	Proponent	Description	Location	Investment	Jobs
Bundi Coal Project	Metro Coal Limited	Development and operation of a new underground mine and associated infrastructure to produce up to 6.5 million tonnes per year (Mt/y) of run-of-mine (ROM) coal, which after processing would result in 5 Mt/y of product coal.	Approximately 20 km south-west of Wandoan.	N/A	N/A
Cameby Downs Expansion Project	Syntech Resources	Proposal to increase the rate of mining of run of mine (ROM) coal from 1.8 million tonnes a year (Mt/y) to 25Mt/y to produce 15Mt/y to 20Mt/y of product coal for export.	Approximately 360 kilometres west, north-west of Brisbane and 16km north-east of Miles, in south-east Queensland.	N/A	200 construction 750 operational
Emu Swamp Dam Project	The proponent for the Urban Water Supply Dam Project is Stanthorpe Shire Council. The proponent for the Combined Urban and Irrigation Dam is Stanthorpe Shire Council on behalf of a local Irrigators Group	Either a 5000-megalitre urban water supply dam or a 10,500 ML urban and irrigation water supply dam (the EIS addresses both options).	Southern Downs Regional Council	$76 million	145 construction (Number of operational jobs not specified)

Project	Proponent	Description	Location	Investment	Jobs
Elimatta Project	Taroom Coal Proprietary Limited, a wholly owned subsidiary of Northern Energy Corporation Limited,	Open-cut thermal coal mine extracting up to 8 million tonnes a year (Mt/y) of run-of-mine (ROM) coal to produce 5 Mt/y of product coal for export.	Western Downs Regional Council area, approximately 45 kilometres south-west of Taroom and 380 kilometres north-west of Brisbane in south-east Queensland.	Approximately $1.3 billion	300 full time staff at full production
Ironbark Project	Origin Energy ATP 788P Pty Ltd, a wholly owned subsidiary of Origin Energy Limited	Coal seam gas (CSG) resources within Authority to Prospect (ATP) 788P, also known as 'Ironbark', near Tara in southern Queensland. First production of sales gas from the Ironbark Project is targeted for 2015 at a rate of 50–60 terajoules per day (TJ/day) with the potential to increase sales gas production to a maximum rate of 120 TJ/day.	▪ Western Downs Regional Council	$1.5 Billion	200 construction
Nathan Dam and Pipelines	SunWater Ltd	An 888,000-megalitre dam, with an annual yield of 66,000 ML; and a 260-kilometre trunk pipeline.	▪ Western Downs Regional Council (pipeline) ▪ Banana Shire (water storage area and pipeline)	$1.4 billion	▪ up to 425 (construction) ▪ up to 5 (operational)

Project	Proponent	Description	Location	Investment	Jobs
North Surat – Collingwood Coal Project	Cockatoo Coal Limited	Open-cut coal mine with a yield of up to six million tonnes per annum of thermal coal; and associated infrastructure.	Western Downs Regional Council	$652 million	▪ 1000 (construction) ▪ 400 (operational)
North Surat – Taroom Coal Project	Cockatoo Coal Limited	Open-cut coal mine with a yield of up to eight million tonnes per annum of thermal coal; and associated infrastructure.	▪ Western Downs Regional Council (part of electricity transmission line) ▪ Banana Shire (mine)	$1.12 billion	▪ 1000 (construction) ▪ 550 (operational)
Norwood Coal Project	Metro Coal Limited	Development and operation of a new underground mine and associated infrastructure to produce up to 6.5 million tonnes per year (Mt/y) of run-of-mine (ROM) coal, which after processing would result in 5 Mt/y of product coal.	Surat Basin, approximately 30 kilometres south-west of Wandoan.	N/A	300 construction 150 operation
Santos GLNG Gas Field Development Project	Santos GLNG is undertaking the project on behalf of the same joint venture arrangement that was established for the GLNG Project, namely Santos Limited, Petroliam Nasional Berhad (PETRONAS), Total, and Korean Gas Corporation (KOGAS)	Progressive development of coal seam gas resources in Surat and Bowen basins.	▪ Banana Shire ▪ Central Highlands Regional Council ▪ Maranoa Regional Council ▪ Western Downs Regional Council	N/A	▪ 1700 (construction) ▪ 200 (operational)

Project	Proponent	Description	Location	Investment	Jobs
Surat Gas Project	Arrow Energy Pty Ltd (Arrow Energy)	Development of some 7,500 coal seam gas production wells and associated facilities within an area of approximately 8,600 square kilometres of petroleum tenures.	Extending from near Wandoan (in the north) to Dalby and Millmerran (in the east) and Goondiwindi (in the south).	N/A	N/A

- **Table G.9.1 Approved projects**

Project	Proponent	Description	Location	Investment	Direct employment
Australia Pacific LNG Project	50:50 joint venture between Origin Energy and ConocoPhillips	Integrated liquefied natural gas (LNG) project	▪ Western Downs Regional Council ▪ Maranoa Regional Council ▪ Toowoomba Regional Council ▪ Banana Shire ▪ Gladstone Regional Council	A$35 billion	3,300 (construction)

Project	Proponent	Description	Location	Investment	Direct employment
Gladstone Liquefied Natural Gas Project	Santos Ltd and Petronas	Integrated liquefied natural gas (LNG) project	▪ Banana Shire Council ▪ Central Highlands Council ▪ Gladstone Regional Council ▪ Maranoa Regional Council ▪ Toowoomba Regional Council ▪ Western Downs Regional Council	US$18.5 billion	▪ 5000 (construction) ▪ 1000 (operational)
Queensland Curtis Liquefied Natural Gas Project	Queensland Gas Company (QGC) Ltd, a wholly owned subsidiary of the BG Group	Integrated liquefied natural gas (LNG) project.	▪ Banana Regional Council ▪ Gladstone Regional Council ▪ Maranoa Regional Council ▪ North Burnett Regional Council ▪ Western Downs Regional Council	US$20.4 billion	▪ 5000 (construction) ▪ 1000 (operational)

Project	Proponent	Description	Location	Investment	Direct employment
Surat Basin Rail	Surat Basin Rail Pty Ltd (as agent for and on behalf of the Surat Basin Rail Joint Venture, comprising ATEC Dawson Valley Railway Pty Ltd (a subsidiary of Australian Transport and Energy Corridor Limited), Xstrata Coal Surat Basin Rail Pty Ltd (a subsidiary of Xstrata Coal Queensland Pty Ltd) and QR Surat Basin Pty Ltd (a subsidiary of QR National Limited	A 214-kilometre railway in the Surat Basin that will connect the Western Railway system near Wandoan to the Moura Railway system near Banana.	▪ Banana Shire Council ▪ Western Downs Regional Council	$1 billion	▪ 1000 (construction) ▪ 44 (operational)
The Range Project	Stanmore Coal Limited (as 100 per cent owner of Comet Coal and Coke Pty Ltd)	Open-cut coal mine - thermal coal would be extracted at a rate of up to 6.3 million tonnes per annum (run-of-mine coal) with a total of 157 million tonnes to be extracted over a 26-year mine life.	25 km south-east of Wandoan	$407-$505 million (development) $71.9 - $81.7million (operation)	The total workforce required during construction would be 300 persons, rising to approximately 400 employees during operations and increasing to an estimated 500 employees during peak production.

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G.9.2 Additional Methodology Notes

Appendix G.9.2 Additional Methodology Notes

The method used by SKM to derive state and sub-state level IO tables and associated impact multipliers for the NSCC Project Economic Impact Analysis is similar to the Distributive Commodity Balance (DCB) Method, which has been used at the University of Western Australia and the University of Western Sydney. Likewise, the DCB method has been adapted from the Generation of Regional Input-Output Tables (GRIT) methodology developed at the University of Queensland.

SKM has adapted the DCB methodology, utilising a specially designed and streamlined hybrid methodology that incorporates the latest advances in disaggregation using location quotients and effective full-time employment to more accurately reflect industrial employment characteristics, the volume of economic activity, and industrial specialisation.

Use of location quotients in disaggregation

Location quotients are indicators of characteristic differences between a reference area or group and a subset of that area or group. At their core, location quotients can be considered to be a measure of dispersion or more simply, a ratio of specialisation of a particular characteristic of the study region to the reference population.

Location quotients have been used extensively in regional economic analysis and are used to apportion, or disaggregate data from large regions down to smaller areas of interest. SKM has used the 2007-2008 IO Tables for Australia developed by the Australian Bureau of Statistics to first create a state IO table for Queensland, and then in-turn transform this table to model the economy of the region.

The location quotients used by SKM indicate a share of employment that an industry has study area in relation to the share of employment within the same industry of the reference region. A location quotient greater than one indicates that the industry within the region of interest is more important to that regional economy than the industry is to the economy of the reference region as a whole.

A variety of location quotients exist including the Simple Location Quotients, Cross-Industry Location Quotients, and Flegg-Location Quotients.

Simple location quotient

National economies typically produce higher proportions of inputs to outputs, attaining higher level of self-sufficiency than state or regional economies. The simple location quotient (SLQ) is an indicator of the degree with which a selected quantitative characteristic, production in this case, is distributed between the State and the national economy and the region and state likewise. It simply compares the relative importance of a sector in a region and its relative importance at a higher level. SLQ can be considered as measure of regional concentration of particular production sector.

The equation takes the form,

SLQ = (ri / r) / (Ri / R)

where ri is the employment within industry i within the region of interest and r is total employment within the region of interest, Ri is the employment within industry i within the reference region, and R is total employment within the reference region. The reference region is assumed to be self sufficient, which in actuality is not always the case.

While the SLQ is generally low-cost and has been employed as an informational tool to describe national, state, and local economies, it is generally recognised as being inappropriate for the purposes of deriving state and sub-State IO tables from the national table due to its tendency to overestimate multipliers and underestimate imports.

Cross-industry location quotient

Cross-industry location quotients (CILQ) attempt to incorporate differing economic structures between regions based on consuming industries output. It calculates a different quotient for each cell of the IO table to disaggregate, rather than a single location quotient being applied to an entire row of the table as is the case for the SLQ. The CIQ is mathematically expressed as,

CIQij = (xi / Xi) / (ri / Rj) = SLQi / SLQj

where xi is the output of industry i within the region of interest, Xi is the output of industry i within the reference region, rj is the output of industry j (that consumes from industry i) within the region of interest and Rj is the output of industry j within the reference region.

As with the SLQ, the CILQ can be calculated using employment data as a proxy for output. In each cell of the IO table, if the CILQ is greater than or equal to one, then the regional coefficient is set equal to the national coefficient, if the CILQ is less than one, the national coefficient is weighted by the CILQ. But given the diversity between regions in across Australia and even more prominent across Queensland, a better constructed regional IO table that reflects the characteristics of the region is more useful for regional decision making.

Despite the fact CILQ technique takes into account the selling and purchasing industry, it does not take into account the relative size of the region. This causes regional imports coefficients of a small region to be equal to those of a great region while imports of a small region will be bigger than imports of a greater region and in such case the intraregional input coefficients are again overestimated. For example, the agricultural sector is far more important to employment (or output) in rural areas than at a national level, which would not be recognised using CILQ.

This would most certainly be the case when disaggregating the state level tables to the region – the CILQ does not provide weighting of industries relative to the output of the region.

Flegg location quotients

To overcome the deficiencies in the SLQ and CILQ, SKM utilised a version of the Flegg Location Quotient (FLQ) that incorporates the latest developments in the field of regional economic analysis. The FLQ does use however, the SLQ and CILQ as a starting point to take into account the relative size of a region and in estimating regional imports taking into account:

- the relative size of the supplying sector,
- the relative size of the purchasing sector, and
- the relative size of the region.

The FLQ is proposed in modified form:

$FLQ_{ij} = (CILQ_{ij})^{*}(\lambda)$

where the parameter λ takes on the form of an incorporated gravity model and is calculated as:

$\lambda = \log_2[1 + (E_{ir} / E_{in})]^{\delta}$

with both $0 \leq \delta < 1$ and $0 \leq \lambda < 1$

Er and En are employment of a sector in the region and in the nation respectively and δ is the weighting parameter based on the size of the region. The larger the regional size, the greater the regional input coefficients and the smaller the regional import coefficients. Furthermore, an augmented of the FLQ takes into account regional specialisation.

Empirical evidence in studies has shown that location quotient based adjustments using the AFLQ are able to produce estimates of output multipliers in all regions that outperform other top-down, location quotient based methods.

In case when SLQj > 1and FLQij ≥ 1 the national coefficients are scaled upwards with constraint of FLQij ≤ 1 in order to eliminate overvalued adjustments.

The δ parameter is required in both versions of the FLQ. The larger the value of δ, the greater the adjustment for regional imports, as it is inversely related to regional size. Previous studies have shown that that value of δ fallings between 0.3 and 0.4, with 0.3 being used by SKM for both Queensland and the region.

Augmented distributive commodity balance

The distributive commodity balance (DCB) method is an iterative approach to the development of regional IO tables. Originally developed using CILQ, the method has been adapted by SKM to use the AFLQ approach. The process allows the incorporation of regional data and is based on based upon an IO table for a larger region, in this case starting with the IO table for Australia. The process implemented by SKM involves 10 steps:

1: Select and adjust the base table

For the creation of the Queensland IO table, the base table selected is the most recent 111-sector national table for 2007-2008 from the ABS.

2: Prepare output data and adjust employment data for EFT

Data is sourced from various ABS and OESR collections that is state and industry specific. The data is sourced for 2007-2008 prices and has been collected in value terms for insertion to the value based Input- Output table. Where output data was not available at the 111 IO table industry classification, it is either manipulated to reflect the same classifications, or employment data is utilised. The employment data is adjusted from the total number of people employed to full time equivalent employment to more accurately depict employment and industrial linkages.

3: Produce preliminary state demand and supply tables

The state share of industrial output as a percentage of national industry output was achieved using AFLQs and where, output data is not available, full-time equivalent employment data is used to calculate the quotients.

4: Insert regionally specific data and determine minimum trade

The DCB method allows for another insertion of state specific data in the way of sales and consumption data. Data is adjusted to conform with 111 industry classifications and inserted as an override to substitute the original demand and supply elements of the table. Minimum tables are then established to show the minimum values at which trade will occur and excess trade amounts are produced for redistribution.

5: Redistribute excess supply and demand

Excess supply of a producing industry is calculated, along with the excess demand of the using industry. In cases where there is excess supply from an industry, it is redistributed to meet excess demand. Additional remaining excess supply is allocated for export is and any remaining excess demand allocated to imports of the output.

6: Produce preliminary state input-output table

The redistributed values are added to the minimum tables established in stage 4 to produce the preliminary state IO table.

7: Insert additional data as table balancing targets

The analyst may decide to provide element targets for the rest of the table to be balanced from. In the case of the Queensland table, the Queensland State Accounts data is inserted and the table balanced from there.

8: Apply biproportional balancing to determine the final table

The biproporational balancing technique, also known as the 'RAS' method, is a procedure for balancing supply and demand in the stable so that each industry has the same level of output. Addition of regional data, redistribution of imports and exports, and balancing targets introduce imbalances, and the application of the biproportional procedure redistributes and balances the table by iterative adjustments.

9: Produce final table and aggregate

The final state table in its 111-industry format is checked for any industries that furnish zero production, checked for accuracy and amalgamated into a higher 19-industry ANZSIC classification for presentation.

10: Producing sub-state tables

The process described above is then repeated, this time using the state table as the foundation table, to furnish sub-State tables.

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G.9.3 Policies for Local Participation

Appendix G.9.3 Policies for local participation

- **Table D-1 Policies aimed at increasing local participation**

Policy	Description
Local Industry Policy – A Fair Go for Queensland	A Local Industry Participation Plan should demonstrate how NAC will: ▪ Ensure that local industry is provided with information in an equitable and timely manner ▪ Ensure appropriate design and procurement strategies to provide equitable access for local industry ▪ Provide local industry with the opportunity to supply under the same terms, standards and conditions as existing supply chain partners ▪ Award contracts on the basis of the most competitive proposal, which should include due consideration of direct and indirect cost factors such as reliability, maintainability, servicing and procurement administration costs ▪ Measure performance, reporting and feedback mechanisms.
Queensland Resources and Energy Sector Code of Practice for Local Content (referred to as the Code herein)	The Code is developed under the rationale that an industry-led approach will produce better local content outcomes as companies have a vested interest in developing local supply chains. The Code promotes adoption of a voluntary self-regulatory regime, which provides full, fair and reasonable opportunity for capable local industry to compete for the supply of goods and services for significant projects. Specifically, under the Code, proponents should: 1. Develop a Local Content Strategy 2. Utilise complementary capacity and capability-building programs 3. Monitor and evaluate Local Content Strategy effectiveness including assessing local content outcomes by undertaking year on year comparative analysis of annual expenditure data. It is noted that Queensland-operating resources and energy companies adopting the code will not be required to complete and submit a Queensland Local Industry Participation Plan (LIPP) to the state government.
Queensland Government Building and Construction Contracts Structured Training Policy - the 10 per cent training policy	This policy is addressed at Queensland Government building or civil construction project (valued over $250,000 for building or $500,000 for civil construction), and requires that a minimum of 10% of the total labour hours must be undertaken by Indigenous workers, apprentices, trainees or cadets or used for the up skilling of existing employees (to a maximum of 25% of the deemed hours).
Indigenous Employment Policy for Queensland Government: Building and Civil Construction Projects—the 20 per cent policy	The IEP 20% Policy applies to all government-funded civil construction contracts with no minimum threshold and building construction projects exceeding $250,000 (GST inclusive) in value, and applies to the specified Aboriginal and Torres Strait Islander communities and the township of Weipa. This policy requires a 20 per cent minimum benchmark of total labour hours with half of the deemed labour hours required to involve accredited training. The Indigenous workforce is to be recruited from the local Aboriginal and Torres Strait Islander community/ies. However, this policy could be adopted or its implementation measures used as a guide or tool for engaging Indigenous workers.