Queensland Energy Database (QEDB) Version 2017

Technical Overview

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1. Overview

Energy has recently become a subject of considerable interest to the government, industry and the public, largely due to escalating prices. Formulating policy around energy requires good data and analysis. Whilst there has been energy data available for Queensland, it is fragmented and incomplete, limiting the potential for research on the impact of policies over time. For this reason a proposal to create a Queensland energy database (QEDB) was made as part of an Advance Queensland fellowship, with a researcher from the University of Queensland working alongside the Department of Energy's analytics team.

The structure of the database is modelled on the United States' Energy Information Agency's (EIA) State Energy Data System (SEDS). SEDS provides historical time series of energy production, consumption, prices, and expenditures by state that are defined as consistently as possible over time and across sectors for analysis and forecasting purposes http://www.eia.gov/state/seds/). The SEDS estimates are used by other offices in EIA (e.g., in forecasting models); U.S. federal government agencies such as the Department of Energy, the Environmental Protection Agency, and the Department of Health and Human Services; Congress and the White House; State energy offices and state environmental offices; academia; industry analysts; students; and the general public.

There is currently no single central repository for aggregated annual energy data in Australia similar to SEDS. It is planned that QEDB will serve two main purposes: (1) to provide state annual energy production, consumption, price and expenditure estimates to Members of Queensland parliament, other state agencies, researchers, analysts and the general public, and (2) to provide the historical series necessary for energy models to test the impact of different policy options. Like SEDS, the QEDB time-series are constructed for 1970 to current. 1970 is a logical starting point because it is prior to significant volatility in energy prices during the 1970s and 1980s, and provides comparison for industry restructuring which was rolled out in the late 1990s. QEDB only provides annual (financial year) data on Queensland and does not seek to provide data on the other states/territories in Australia.

The level of data in QEDB differs to that in SEDS in the following ways:

- SEDS provides significant detail on petroleum products production and consumption, whereas QEDB has a single series for all petroleum products and consumption. This is largely due to a lack of more data but also because Queensland's oil industry is considerably smaller than those in the US.
- SEDS provides no detail on electricity production capacity and generation from fossil fuels, whereas QEDB details electricity production capacity, energy production and energy supplied from all sources.
- SEDS provides no detail on carbon dioxide emissions, whereas QEDB details carbon emissions (where available or discoverable) from all fossil fuels.
- QEDB provides a few extra series on the economic context including CPI, PPI, employment, AU$-US$ exchange rate and international crude oil prices.

On completion of collection of known available data, there are gaps in the series and inconsistencies on data reported by different entities. The general principle in estimating for the gaps is to use a proxy/index to extrapolate, or where more appropriate, the application of an average growth between contiguous available data. In some cases where estimation is considered to be too nebulous, no estimation is provided. Greater detail of assumption and estimation methods is provided in Section 4.

QEDB has been more than a year in the making, by a single researcher. Data sources and estimation methods have been reviewed by selected industry specialists and government officials. Notwithstanding the review process, the Department of Natural Resources Mines and Energy has not verified and does not accept responsibility for the accuracy of this data nor for use of this data by any person. Any errors identified should be reported to the author.

Any persons wishing to use this data (for any purpose whatsoever) must make their own enquiries and satisfy themselves as to its validity.

2. Description of QEDB

2.1. Queensland energy resources

Queensland energy sources include: thermal and metallurgical coal; conventional and unconventional natural gas; a variety of petroleum products; biofuels; electricity from coal, natural gas, petroleum products, solar, wind, biomass, hydro-electricity and other sources.

2.2. Framework for QEDB data

2.2.1. Data series names and descriptions

There are 570 variables in QEDB. All of the variables are identified by data series names, or DSN, which are six-character codes, structured as follows (see details in tables below):

- First and second characters - describes the energy source
- Third and fourth characters - describes the energy sector and/or an energy activity
- Fifth and sixth characters - describes the type of data

For example, the DSN CLPRPU would describe the series for production in metric tonnes for all coal types.

2.2.2. Energy products and total economy: First and second characters of DSN

Energy source	Description	DSN characters
Energy products		
All sources	All energy sourced	TE
Coal	All coal	CL
	Coking coal	CK
	Thermal coal	CT
Electricity	Electricity supplied from all energy sources	ES (for consumption only)
Gas	All gas	GS
	Conventional (dry) gas	GC
	Unconventional (coal seam) gas	GU
Other	Other miscellaneous energy sources	OT
Petroleum products	All petroleum products	PP
	Condensate	PC
	Liquid petroleum	PL
	Crude oil	PO
Renewable sources	All energy sourced from renewable sources	RE
	Energy sourced from wood and biomass waste	RB

Energy source	Description	DSN characters
	Biofuels (ethanol)	RF
	Geothermal	RG
	Hydroelectricity	RH
	Energy sourced from solar thermal	RS
	Energy sources from solar photovoltaics	RP
	Energy sourced from wind	RW
All sources	All energy sourced	TE
Economy		
Economy	Queensland Economy related data	QE
	Australia related data	AU

2.2.3. Energy sectors and activities: Third and fourth characters of DSN

Activity	Activity and sector	DSN characters
Energy sectors and activities		
Reserves	Reserves identified	RI
	Electricity generation capacity (public electricity)	ER
	Electricity generation capacity (private use)	AR
Production	Production of primary energy	PR
	Production of electricity (public electricity)	EP
	Production of electricity (private use)	AP
	Electricity sent out from public generators (excludes electricity consumed in generation)	ES
	Electricity sent out from private generators (excludes electricity consumed in generation)	AS
Consumption	All consumption	CS
	Residential sector consumption	CR
	Commercial sector consumption	CC
	Industrial sector consumption	CI

Activity	Activity and sector	DSN characters
	Transport sector consumption	CT
	Electricity industry consumption	CP
Network	Transmission	TT
	Distribution	TD
Export	International exports	EI
	Interstate exports	ED
Import	International imports	II
	Interstate imports	ID
Employment	All employment	JB
Economy		
Economy	Gross state product	GP
	Cost Price Index (Brisbane)	IN
	Cost Price Index – Electricity (Brisbane)	IC
	Producer Price Index (Australia)	IP
	Producer Price Index – Electricity (Australia)	IE
	Producer Price Index – Gas (Australia)	IG
	Population	PN
	Labour force	LF
	Employment	JB
	Royalties	PI
	Exchange rate: AU-US	US
	Crude oil: Dubai Arab Historical Series	DA

2.2.4. Energy data type: Fifth and sixth characters of DSN

Data type	DSN characters
Carbon dioxide emissions	CD
Customer numbers	CN
Dollar per GJ (Nominal)	DG
Dollar per physical unit (Nominal)	DP

Data type	DSN characters
Value of expenditure (Nominal)	DV
Gigajoule	GJ
Factor for converting from physical unit to GJ	KG
Line length in circuit kilometres	PK
Physical unit	PU
Dollar per GJ (Real)	RG
Dollar per physical unit (Real)	RP
Value of expenditure (Real)	RV

2.2.5. Energy consuming sectors

To the degree possible, energy consumption and value/pricing information in the database could be assigned to five sectors according to the following general definitions:

Sector	Description	Common uses
Residential (CR)	Consists of living quarters for private households	Space heating; water heating; air conditioning; lighting; refrigeration; cooking and running a variety of other appliances
Commercial (CC)	Consists of service-providing facilities and equipment from businesses, governments, organisations like religious groups including the following ANZSIC divisions/classifications: gas, water and waste services (D – 27,28,29); wholesale trade (F); retail trade (G); accommodation and food services (H); postal and warehousing services (I – 51,53); information media and telecommunications (J); financial and insurance services (K); rental hiring and real estate services (L); professional, scientific and technical services (M); administrative and support services (N); public and administration and safety (O); education and training (P); health care and social assistance (Q); arts and recreation services I; other (S)	Space heating; water heating; air conditioning; lighting; refrigeration; cooking and running a wide variety of equipment

Industrial (CI)	Consists of all facilities and equipment used for producing, processing or assembling goods including the following ANZSIC Division classifications: agriculture, forestry and fishing (A); mining (B); manufacturing (C); construction (E)	Process heat and cooling and powering machinery in addition to facility heating, air conditioning, and lighting
Transportation (CT)	Consists of all vehicles and functions whose primary purpose is transporting people and/or goods from one physical location to another including the following ANZSIC divisions/classifications: road, rail, water, air and space, and other transport (I – 46-50); transport support services (I-52)	Fuels for transportation in automobiles; trucks; buses; motorcycles; trains; aircraft; ships and waterborne vehicles. Vehicles whose primary purpose is not transportation (eg construction cranes and bulldozers, farming vehicles, warehouse forklifts) are classified in the sector of their primary use.
Electric power (CP)	Consists of electricity generation, transmission, distribution and retail functions whose primary business is to sell electricity to the public including the following ANZSIC divisions/classifications: electricity supply (D-26)	Fuel for combustion

3. Primary data modules

There are 6 modules of data:

1. Coal reserves, production, consumption, CO_2 emissions, value and employment data
2. Gas reserves, production, consumption, CO_2 emissions, value and employment data
3. Oil reserves, production, consumption, CO_2 emissions, value and employment data
4. Electricity generating capacity, production, consumption, value and employment data
5. Biomass and biofuels production and consumption data
6. Salient economic data

3.1. Coal data

3.1.1. Structure of QEDB coal data

Following the data structure as detailed in Section 2, the data series provided in QEDB for coal are the follows:

Data Series Name (DSN)	Data Series Description	Unit
Coal reserves		
CKRIPU	Coking coal reserves in physical units	Tonnes
CTRIPU	Thermal coal reserves in physical units	Tonnes
CLRIPU	All coal reserves in physical units	Tonnes
CKRIGJ	Coking coal reserves in energy units	Gigajoules
CTRIGJ	Thermal coal reserves in energy units	Gigajoules
CLRIGJ	All coal reserves in energy units	Gigajoules
CKRIKG	Factor to convert coking coal reserves from physical units to energy units	Gigajoules / tonne
CTRIKG	Factor to convert thermal coal reserves from physical units to energy units	Gigajoules / tonne
CLRIKG	Factor to convert all coal reserves from physical units to energy units	Gigajoules / tonne
Coal production		
CKPRPU	Coking coal production in physical units	Tonnes
CTPRPU	Thermal coal production in physical units	Tonnes
CLPRPU	All coal production in physical units	Tonnes
CKPRGJ	Coking coal production in energy units	Gigajoules
CTPRGJ	Thermal coal production in energy units	Gigajoules

Data Series Name (DSN)	Data Series Description	Unit
CLPRGJ	All coal production in energy units	Gigajoules
CKPRKG	Factor to convert coking coal production from physical units to energy units	Gigajoules / tonne
CTPRKG	Factor to convert thermal coal production from physical units to energy units	Gigajoules / tonne
CLPRKG	Factor to convert all coal production from physical units to energy units	Gigajoules / tonne
CLPRDV	Value of coal production at mine head (Nominal)	$ millions
CLPRDP	Price of coal production at mine head in physical units (Nominal)	$ / tonne
CLPRDG	Price of coal production at mine head in energy units (Nominal)	$ / gigajoule
CLPIDV	Royalty payments for coal production (Nominal)	$2017 millions
CLPRRV	Value of coal production at mine head (Real)	$2017 millions
CLPRRP	Price of coal production at mine head in physical units (Real)	$2017 / tonne
CLPRRG	Price of coal production at mine head in energy units (Real)	$2017 / gigajoule
CLPIRV	Royalty payments for coal production (Real)	$2017 millions
Coal exports		
CKEDPU	Coking coal sales interstate in physical units	Tonnes
CTEDPU	Thermal coal sales interstate in physical units	Tonnes
CLEDPU	All coal sales interstate in physical units	Tonnes
CKEIPU	Coking coal international sales in physical units	Tonnes
CTEIPU	Thermal coal international sales in physical units	Tonnes
CLEIPU	All coal international sales in physical units	Tonnes
CKEDGJ	Coking coal sales interstate in energy units	Gigajoules
CTEDGJ	Thermal coal sales interstate in energy units	Gigajoules
CLEDGJ	All coal interstate sales in energy units	Gigajoules
CKEIGJ	Coking coal international sales in energy units	Gigajoules
CTEIGJ	Thermal coal international sales in energy units	Gigajoules
CLEIGJ	All coal international sales in energy units	Gigajoules

Data Series Name (DSN)	Data Series Description	Unit
CKEDKG	Factor to convert coking coal interstate sales from physical units to energy units	Gigajoules / tonne
CTEDKG	Factor to convert thermal coal interstate sales from physical units to energy units	Gigajoules / tonne
CLEDKG	Factor to convert all coal interstate sales from physical units to energy units	Gigajoules / tonne
CKEIKG	Factor to convert coking coal international sales from physical units to energy units	Gigajoules / tonne
CTEIKG	Factor to convert thermal coal international sales from physical units to energy units	Gigajoules / tonne
CLEIKG	Factor to convert all coal international sales from physical units to energy units	Gigajoules / tonne
CKEDDV	Value of coking coal interstate sales (nominal)	$ millions
CTEDDV	Value of thermal coal interstate sales (nominal)	$ millions
CLEDDV	Value of all coal interstate sales (nominal)	$ millions
CKEIDV	Value of coking coal international sales (nominal)	$ millions
CTEIDV	Value of thermal coal international sales (nominal)	$ millions
CLEIDV	Value of all coal international sales (nominal)	$ millions
CKEDDP	Price for coking coal interstate sales in physical units (nominal)	$ / tonne
CTEDDP	Price for thermal coal interstate sales in physical units (nominal)	$ / tonne
CLEDDP	Price for all coal interstate sales in physical units (nominal)	$ / tonne
CKEIDP	Price for coking coal international sales in physical units (nominal)	$ / tonne
CTEIDP	Price for thermal coal international sales in physical units (nominal)	$ / tonne
CLEIDP	Price for all coal international sales in physical units (nominal)	$ / tonne
CKEDDG	Price for coking coal interstate sales in energy units (nominal)	$ / gigajoule
CTEDDG	Price for thermal coal interstate sales in energy units (nominal)	$ / gigajoule
CLEDDG	Price for all coal interstate sales in energy units (nominal)	$ / gigajoule
CKEIDG	Price for coking coal international energy in energy units (nominal)	$ / gigajoule

Data Series Name (DSN)	Data Series Description	Unit
CTEIDG	Price for thermal coal international energy in energy units (nominal)	$ / gigajoule
CLEIDG	Price for all coal international sales in energy units (nominal)	$ / gigajoule
CKEDRV	Value of coking coal interstate sales (Real)	$2017 millions
CTEDRV	Value of thermal coal interstate sales (Real)	$2017 millions
CLEDRV	Value of all coal interstate sales (Real)	$2017 millions
CKEIRV	Value of coking coal international sales (Real)	$2017 millions
CTEIRV	Value of thermal coal international sales (Real)	$2017 millions
CLEIRV	Value of all coal international sales (Real)	$2017 millions
CKEDRP	Price for coking coal interstate sales in physical units (Real)	$2017 / tonne
CTEDRP	Price for thermal coal interstate sales in physical units (Real)	$2017 / tonne
CLEDRP	Price for all coal interstate sales in physical units (Real)	$2017 / tonne
CKEIRP	Price for coking coal international sales in physical units (Real)	$2017 / tonne
CTEIRP	Price for thermal coal international sales in physical units (Real)	$2017 / tonne
CLEIRP	Price for all coal international sales in physical units (Real)	$2017 / tonne
CKEDRG	Price for coking coal interstate sales in energy units (Real)	$2017 / gigajoule
CTEDRG	Price for thermal coal interstate sales in energy units (Real)	$2017 / gigajoule
CLEDRG	Price for all coal interstate sales in energy units (Real)	$2017 / gigajoule
CKEIRG	Price for coking coal international energy in energy units (Real)	$2017 / gigajoule
CTEIRG	Price for thermal coal international energy in energy units (Real)	$2017 / gigajoule
CLEIRG	Price for all coal international sales in energy units (Real)	$2017 / gigajoule
Coal consumption		
CKCIPU	Coking coal domestic sales in physical units	Tonnes
CLCCPU	Coal domestic sales to commercial sector in physical units	Tonnes
CLCPPU	Coal domestic sales to electric power sector in physical units	Tonnes
CTCIPU	Thermal coal domestic sales to industrial customers in physical units	Tonnes
CLCRPU	Coal domestic sales to residential sector in physical units	Tonnes

Data Series Name (DSN)	Data Series Description	Unit
CLCTPU	Coal domestic sales to transportation sector in physical units	Tonnes
CLCSPU	All coal domestic sales in physical units	Tonnes
CKCIGJ	Coking coal domestic sales in energy units	Gigajoules
CLCCGJ	Coal domestic sales to commercial sector in energy units	Gigajoules
CLCPGJ	Coal domestic sales to electric power sector in energy units	Gigajoules
CTCIGJ	Thermal coal domestic sales to industrial customers in energy units	Gigajoules
CLCRGJ	Coal domestic sales to residential sector in energy units	Gigajoules
CLCTGJ	Coal domestic sales to transportation sector in energy units	Gigajoules
CLCSGJ	All coal domestic sales in energy units	Gigajoules
CKCIKG	Factor to convert domestic coking coal consumption from physical units to energy units	Gigajoules / tonne
CTCIKG	Factor to convert domestic thermal coal consumption for industry sector from physical units to energy units	Gigajoules / tonne
CLCCKG	Factor to convert domestic thermal coal consumption for commercial sector from physical units to energy units	Gigajoules / tonne
CLCPKG	Factor to convert domestic thermal coal consumption for electric power sector from physical units to energy units	Gigajoules / tonne
CLCRKG	Factor to convert domestic thermal coal consumption for residential sector from physical units to energy units	Gigajoules / tonne
CLCTKG	Factor to convert domestic thermal coal consumption for transport sector from physical units to energy units	Gigajoules / tonne
CLCSKG	Factor to convert domestic thermal coal consumption for all sectors from physical units to energy units	Gigajoules / tonne
CKCIDV	Value of domestic coking coal sales	$ millions
CTCIDV	Value of domestic thermal coal sales to industrial sector	$ millions
CLCCDV	Value of domestic thermal coal sales to commercial sector	$ millions
CLCPDV	Value of domestic thermal coal sales to electric power sector	$ millions
CLCRDV	Value of domestic thermal coal sales to residential sector	$ millions
CLCTDV	Value of domestic thermal coal sales to transport sector	$ millions
CLCSDV	Value of all domestic coal sales to all sectors	$ millions

Data Series Name (DSN)	Data Series Description	Unit
CKCIDP	Price for domestic coking coal sales in physical units	$ / tonne
CLCCDP	Price for domestic thermal coal sales to commercial sector in physical units	$ / tonne
CLCPDP	Price for domestic thermal coal sales to electric power sector in physical units	$ / tonne
CTCIDP	Price for domestic thermal coal sales to industrial sector in physical units	$ / tonne
CLCRDP	Price for domestic thermal coal sales to residential sector in physical units	$ / tonne
CLCTDP	Price for domestic thermal coal sales to transport sector in physical units	$ / tonne
CLCSDP	Price for all domestic coal sales to all sectors in physical units	$ / tonne
CKCIDG	Price for domestic coking coal sales in energy units	$ / gigajoule
CLCCDG	Price for domestic thermal coal sales to commercial sector in energy units	$ / gigajoule
CLCPDG	Price for domestic thermal coal sales to electric power sector in energy units	$ / gigajoule
CTCIDG	Price for domestic thermal coal sales to industrial sector in energy units	$ / gigajoule
CLCRDG	Price for domestic thermal coal sales to residential sector in energy units	$ / gigajoule
CLCTDG	Price for domestic thermal coal sales to transport sector in energy units	$ / gigajoule
CLCSDG	Price for all domestic coal sales to all sectors in energy units	$ / gigajoule
CKCIRV	Value of domestic coking coal sales (real)	$2017 millions
CTCIRV	Value of domestic thermal coal sales to industrial sector (real)	$2017 millions
CLCCRV	Value of domestic thermal coal sales to commercial sector (real)	$2017 millions
CLCPRV	Value of domestic thermal coal sales to electric power sector (real)	$2017 millions
CLCRRV	Value of domestic thermal coal sales to residential sector (real)	$2017 millions
CLCTRV	Value of domestic thermal coal sales to transport sector (real)	$2017 millions
CLCSRV	Value of all domestic coal sales to all sectors (real)	$2017 millions

Data Series Name (DSN)	Data Series Description	Unit
CKCIRP	Price for domestic coking coal sales in physical units (real)	$2017 / tonne
CLCCRP	Price for domestic thermal coal sales to commercial sector in physical units (real)	$2017 / tonne
CLCPRP	Price for domestic thermal coal sales to electric power sector in physical units (real)	$2017 / tonne
CTCIRP	Price for domestic thermal coal sales to industrial sector in physical units (real)	$2017 / tonne
CLCRRP	Price for domestic thermal coal sales to residential sector in physical units (real)	$2017 / tonne
CLCTRP	Price for domestic thermal coal sales to transport sector in physical units (real)	$2017 / tonne
CLCSRP	Price for all domestic coal sales to all sectors in physical units (real)	$2017 / tonne
CKCIRG	Price for domestic coking coal sales in energy units (real)	$2017 / gigajoule
CLCCRG	Price for domestic thermal coal sales to commercial sector in energy units (real)	$2017 / gigajoule
CLCPRG	Price for domestic thermal coal sales to electric power sector in energy units (real)	$2017 / gigajoule
CTCIRG	Price for domestic thermal coal sales to industrial sector in energy units (real)	$2017 / gigajoule
CLCRRG	Price for domestic thermal coal sales to residential sector in energy units (real)	$2017 / gigajoule
CLCTRG	Price for domestic thermal coal sales to transport sector in energy units (real)	$2017 / gigajoule
CLCSRG	Price for all domestic coal sales to all sectors in energy units (real)	$2017/ gigajoule
Coal emissions from combustion		
CLCPCD	CO_2 emissions from coal-fired generation for public electricity supply	Tonnes CO_2-^{e}
CLCICD	CO_2 emissions from industry coal combustion	Tonnes CO_2-^{e}
CLCSCD	CO_2 emissions from coal combustion	Tonnes CO_2-^{e}

3.1.2. Primary sources of data for coal module

3.1.2.1. Queensland Coal Board (QCB) Annual Reports

The majority of data from 1952-2003 is sourced from QCB Annual Reports. The reports are available under the heading of Queensland Coal Board Series from:

https://www.dnrm.qld.gov.au/__data/assets/pdf_file/0003/188625/qdex-index-collections.pdf

Details and frequency of data available include:

- Reserves by basin, in physical units (1970-03)
- Production by mine, in physical units (1970-03)
- International exports by mine, in physical units (1970-03)
- Interstate exports by mine, in physical units (1970-95, excluding 1989)
- Large coal mine export prices in US $ (1974-1982)
- Total value of international exports in Australian $ (1983-1990)
- Average price of coking coal exports in Australian $ (1983-1990)
- Average price of domestic thermal coal in Queensland regions in Australian $ (1974-1990)
- Energy content of coal in gigajoules/tonne (occasionally)
- Coal consumption by industry sector (1970-03)
- Employment in the coal industry (1970-03)

3.1.2.2. Queensland Department of Natural Resources and Mines (QDNRM) "Green Book" 2003

Estimating the energy content of reserves, production, exports and consumption requires data on energy content by mine. QUEENSLAND COALS: Physical and Chemical Properties, Colliery and Company Information; 14th Edition 2003, Compiled by Andrew J. Mutton is available from

https://www.dnrm.qld.gov.au/?a=267497

and provides an estimate of calorific value for each mine. This report is commonly referenced as the "Green Book". For more recent mines, Geological Survey of Queensland's (GSQ) Senior Project Offices, David Coffey, provided guidance as to similarity between mines and known calorific value estimate.

3.1.2.3. Queensland Department of Natural Resources and Mines' Coal Production and Coal Sales Databases of monthly and quarterly coal returns (QCD)

The majority of data from 2004-17 is sourced from Department of Mines Coal Production and Sales Databases (QCD). Extracts from the databases were provided by the QDNRM Statewide Operations' Senior Project Officer, Kathryn Keir.

Details and frequency of data available include:

- Production by mine, in physical units (1996-2018)
- International exports by mine, in physical units (1996-2018)
- Interstate exports by mine, in physical units (1996-2018)
- Large coal mine export values in Australian $ (1996-2018)
- Coal mine domestic thermal coal value in Australian $ (2015 onwards)
- Coal sales by mine and customer (1996-2018)
- Employment in coal industry (2005 only)

Note: The data in QCD prior to 2004 was found to be corrupted. It was apparent that some domestic sales data had been incorrectly (re-)classified as international and interstate sales. For this reason, all data for the period 1996-2003 was re-sourced from QCB Annual Reports. Kathryn Keir has spent a considerable amount of time attempting to rectify the misallocations. It is not known whether all the errors in the database have been corrected.

3.1.2.4. Queensland Department of Natural Resources and Mines' Mineral and Energy Resources Location and Information Network (MERLIN)

Table P1 Quantity and Value of Production by Individual Producer, Unit Value at Mine includes data on average mine sales prices, transport costs and mine-head value. Table P1 was extracted by QDNRM's Kathryn Keir.

Details and frequency of data available include:

- Quantity produced, by mine, in physical units (1997-2012)
- Quantity sold, by mine, in physical units (1997-2012)
- Value of sales, by mine, in Australian $ (1997-2012)
- Value of production at mine, in Australian $ (1997-2012)

This report is helpful in establishing prices for domestic and interstate sales. Unfortunately contributions to the system by miners declined after 2009 rendering the system less useful. According to QDNRM's Annual Report 2015-16, the MERLIN system is on a pathway to being decommissioned.

3.1.2.5. Queensland Department of Mines (QDM) Annual Reports

QDM Annual Reports were published for the years 1877-2008. The reports are available under the heading of Annual Report Series from:

https://www.dnrm.qld.gov.au/__data/assets/pdf_file/0003/188625/qdex-index-collections.pdf

Details and frequency of data available include:

- Total production of all coal, in physical units (1970-90)
- Total value of all coal produced at mine-head, in physical units (1970-90)
- Coal royalties paid to Queensland government (1970-88)

Total value and tonnes of all coal produced provides a mine-head value to estimate the value of coal produced as related to the production reported by the QCB.

3.1.2.6. Queensland Year Book (QYB)

QYB provided data on all activities within Queensland for the period 1901-2001, although publication was not always annual. The reports are available from the Australian Bureau of Statistics at:

http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/1301.3Main+Features11901?OpenDocument

Details and frequency of data available include:

- Total production of all coal, in physical units (1970-96)
- Total value of all coal produced at mine-head, in Australian $ (1970-96)
- Coal royalties paid to Queensland government in Australian $ (1970-84)

3.1.2.7. Queensland Treasury, Spreadsheet from James Moore: Summary of royalty revenue

This spreadsheet details royalties received for coal, petroleum, and Other in Australian $ from fiscal year 1988-89 to 2016-17.

Spreadsheet received from James Moore in email to Lynette Molyneaux, dated 8 June 2018.

3.1.2.8. Queensland Historical Tables, Economy (QHT-E), 1860-2008

QHT-E provides value of coal exports including the years 1970-2008. QHT-E are available from:

http://www.qgso.qld.gov.au/products/tables/historical-tables-economy/

Details and frequency of data available include:

- Total value of coal exports, in Australian $ (1970-2008)

Note: The value of coal exports after 2003 excludes certain classes of coal and therefore cannot be used to cross-reference to totals as estimated for QEDB.

3.1.2.9. Queensland Department of Natural Resources and Mines' Mines and Explosive Levy Database of employees and contractors for OHS levy calculation (MELD)

Employment data from 2006-17 is sourced from QDNRM MELD. Extracts from the database of quarterly employment totals for all coal mines were provided by the Department of Mines' Occupational Health and Safety group.

Details and frequency of data available include:

- Quarterly number of employees and contractors on coal mines for calculation of miners' OHS levy (2006-17)

3.1.2.10. Miscellaneous other sources of data for estimating prices

Prices for interstate and domestic consumption required a number of ad hoc sources of data, including:

- Queensland Electricity Generating Board (QEDB): Fuel cost, 1978-1984
  http://onesearch.slq.qld.gov.au/primo-explore/fulldisplay?docid=slq_alma21116110780002061&context=L&vid=SLQ&lang=en_US&search_scope=SLQ_PCI_EBSCO&adaptor=Local%20Search%20Engine&tab=all&query=any,contains,queensland%20electricity%20generating%20board%20annual%20report&sortby=rank&offset=0
- Queensland Electricity Commission (QEC): Fuel cost, 1985-1994
  https://espace.library.uq.edu.au/records/search?page=1&pageSize=20&sortBy=published_date&sortDirection=Desc&searchQueryParams%5Ball%5D=Queensland+Electricity+Commission+Annual+Report
- Queensland Electricity Industry Structure Task Force: December 1996. Report on the Reform of the Queensland Electricity Supply Industry
  Book from Department of Energy
- ACIL Tasman Fuel resource, new entry and generation costs in the NEM 2007
  Sourced from personal collection
- ACIL Tasman Fuel resource, new entry and generation costs in the NEM 2009
  https://www.aemo.com.au/media/Files/Other/planning/419-0035%20pdf.pdf
- ACIL Allen Fuel and Technology Cost Review 2014
  https://www.aemo.com.au/-/media/Files/PDF/Fuel_and_Technology_Cost_Review_Report_ACIL_Allen.pdf
- Frontier Economics: AEMC Assumptions Workbook 2017
  Sourced from Department of Energy

3.1.2.11. Australian Greenhouse Emissions Information System (AGEIS)

Greenhouse emissions from the combustion of fuels are reported annually in AGEIS from 1990-2016. The data was reported by state and by fuel source, and can be found at:

http://ageis.climatechange.gov.au/

3.1.3. Cross reference data for coal module

3.1.3.1. Australian Energy Statistics (AES)

Australian Energy Statistics provides data on production and consumption of energy by state from 1974 to 2017. AES can be found at:

https://www.energy.gov.au/government-priorities/energy-data/australian-energy-statistics

AES does not provide data on reserves, exports, prices, employment or emission data. There are discrepancies between what is reported in QDNRM publications and AES, although the differences are not large.

3.1.3.2. Electricity Supply Association of Australia (ESAA)

ESAA provides data on fuel consumed by electricity power stations by state for 1955-2016. ESAA has now been reformed and called Australian Energy Council. Reports from 2015 can be found at:

https://www.energycouncil.com.au/

and on request from Australian Energy Council for earlier years, although records prior to 2005 are no longer available. The full series of ESAA was sourced from personal collections.

3.1.3.3. National Greenhouse and Energy Reporting (NGER)

Access to NGER is restricted and controlled by the Clean Energy Regulator (CER). For the purposes of QEDB, the CER provided access to NGER data for Queensland to the Analytics group within the Queensland Department of Energy (QDE).

Production, consumption and emissions data from NGER was cross-referenced to QEDB data and in some cases used to complete series for QEDB.

3.1.3.4. Total Coal Exports by Type, monthly. Spreadsheet from Cecil Chan in Queensland Treasury

Spreadsheet details coal exports in physical units and Australian $ from July 1995 to December 2017.

Cross referencing data as estimated for QEDB to the Treasury coal exports spreadsheets shows small differences, considered to be differences of timing.

3.1.3.5. Australian Bureau of Statistics (ABS), Series 6291.0.55.003 - EQ06 - Employed persons by industry group

ABS employment data from 1985-17 for Queensland coal mining can be found at:

http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6291.0.55.003Feb%202018?OpenDocument

ABS employment data shows significant volatility over the years, particularly from 1993-00 and again from 2005-09. After 2007, employment data as reported by DNRM MELD is consistently larger (31% from 2007-2017) than that reported by ABS. As companies pay OHS Levy on the employment numbers reported in MELD, it is assumed that the data as reported in MELD are more reliable than those reported by ABS.

3.2. Gas data

3.2.1. Structure of QEDB gas data

Following the data structure as detailed in Section 2, the data series provided in QEDB for gas are the follows:

Data Series Name (DSN)	Data Series Description	Unit
Gas reserves		
GSRIPU	All gas reserves in physical units	Millions m^3
GSRIGJ	All gas reserves in energy units	Gigajoules
GCRIKG	Factor to convert gas reserves from physical units to energy units	Gigajoules / m^3
Gas production		
GCPRPU	Conventional gas production in physical units	Millions m^3
GUPRPU	Unconventional gas production in physical units	Millions m^3
GSPRPU	All gas production in physical units	Millions m^3
GCPRGJ	Conventional gas production in energy units	Gigajoules
GUPRGJ	Unconventional gas production in energy units	Gigajoules
GSPRGJ	All gas production in energy units	Gigajoules
GCPRKG	Factor to convert conventional gas production from physical units to energy units	Gigajoules / m^3
GUPRKG	Factor to convert unconventional gas production from physical units to energy units	Gigajoules / m^3
GSPRKG	Factor to convert all gas production from physical units to energy units	Gigajoules / m^3
GSPRDV	Value of gas production at mine head (nominal)	$ millions
GSPRDG	Price of gas production at mine head in energy units (nominal)	$ / gigajoule
GSPRRV	Value of gas production at mine head (real)	$2017 millions
GSPRRG	Price of gas production at mine head in energy units (real)	$2017 / gigajoule
Gas exports		
GSEDPU	Gas sales interstate in physical units	Millions m^3
GSEIPU	Liquid Natural Gas international sales in physical units	Tonnes
GSEDGJ	Gas sales interstate in energy units	Gigajoules
GSEIGJ	Liquid Natural Gas international sales in energy units	Gigajoules

Data Series Name (DSN)	Data Series Description	Unit
GSEDKG	Factor to convert gas interstate sales from physical units to energy units	Gigajoules / m^3
GSEIKG	Factor to convert liquid natural gas international sales from physical units to energy units	Gigajoules / tonne
GSEDDV	Value of gas interstate sales (nominal)	$ millions
GSEIDV	Value of liquid natural gas international sales (nominal)	$ millions
GSEDDG	Price for gas interstate sales in energy units (nominal)	$ / gigajoule
GSEIDG	Price for liquid natural gas international energy in energy units (nominal)	$ / gigajoule
GSEDRV	Value of gas interstate sales (real)	$2017 millions
GSEIRV	Value of liquid natural gas international sales (real)	$2017 millions
GSEDRG	Price for gas interstate sales in energy units (real)	$2017 / gigajoule
GSEIRG	Price for liquid natural gas international energy in energy units (real)	$2017 / gigajoule
Gas imports		
GSIDPU	Gas purchases interstate in physical units	Millions m^3
GSIDGJ	Gas purchases interstate in energy units	Gigajoules
GSIDKG	Factor to convert gas interstate purchases from physical units to energy units	Gigajoules / m^3
GSIDDV	Value of gas interstate purchases (nominal)	$ millions
GSIDDG	Price for gas interstate purchases in energy units (nominal)	$ / gigajoule
GSIDRV	Value of gas interstate purchases (real)	$2017 millions
GSIDRG	Price for gas interstate purchases in energy units (real)	$2017 / gigajoule
Gas consumption		
GSCCPU	Gas domestic sales to commercial sector in physical units	Millions m^3
GSCPPU	Gas domestic sales to electric power sector in physical units	Millions m^3
GSCIPU	Gas domestic sales to industrial customers in physical units	Millions m^3
GSCRPU	Gas domestic sales to residential sector in physical units	Millions m^3
GSCTPU	Gas domestic sales to transportation sector in physical units	Millions m^3
GSCSPU	Gas domestic sales in physical units	Millions m^3

Data Series Name (DSN)	Data Series Description	Unit
GSCCGJ	Gas domestic sales to commercial sector in energy units	Gigajoules
GSCPGJ	Gas domestic sales to electric power sector in energy units	Gigajoules
GSCIGJ	Gas domestic sales to industrial customers in energy units	Gigajoules
GSCRGJ	Gas domestic sales to residential sector in energy units	Gigajoules
GSCTGJ	Gas domestic sales to transportation sector in energy units	Gigajoules
GSCSGJ	All gas domestic sales in energy units	Gigajoules
GSCSKG	Factor to convert domestic gas consumption for all sectors from physical units to energy units	Gigajoules / m^3
GSCCDV	Value of domestic gas sales to commercial sector	$ millions
GSCPDV	Value of domestic gas sales to electric power sector	$ millions
GSCIDV	Value of domestic gas sales to industrial sector	$ millions
GSCRDV	Value of domestic gas sales to residential sector	$ millions
GSCTDV	Value of domestic gas sales to transport sector	$ millions
GSCSDV	Value of all domestic gas sales to all sectors	$ millions
GSCCDG	Price for domestic gas sales to commercial sector in energy units	$ / gigajoule
GSCPDG	Price for domestic gas sales to electric power sector in energy units	$ / gigajoule
GSCIDG	Price for domestic gas sales to industrial sector in energy units	$ / gigajoule
GSCRDG	Price for domestic gas sales to residential sector in energy units	$ / gigajoule
GSCTDG	Price for domestic gas sales to transport sector in energy units	$ / gigajoule
GSCSDG	Price for all domestic gas sales to all sectors in energy units	$ / gigajoule
GSCCRV	Value of domestic gas sales to commercial sector (real)	$2017 millions
GSCPRV	Value of domestic gas sales to electric power sector (real)	$2017 millions
GSCIRV	Value of domestic gas sales to industrial sector (real)	$2017 millions
GSCRRV	Value of domestic gas sales to residential sector (real)	$2017 millions
GSCTRV	Value of domestic gas sales to transport sector (real)	$2017 millions
GSCSRV	Value of all domestic gas sales to all sectors (real)	$2017 millions
GSCCRG	Price for domestic gas sales to commercial sector in energy units (real)	$2017 / gigajoule

Data Series Name (DSN)	Data Series Description	Unit
GSCPRG	Price for domestic gas sales to electric power sector in energy units (real)	$2017 / gigajoule
GSCIRG	Price for domestic gas sales to industrial sector in energy units (real)	$2017 / gigajoule
GSCRRG	Price for domestic gas sales to residential sector in energy units (real)	$2017 / gigajoule
GSCTRG	Price for domestic gas sales to transport sector in energy units (real)	$2017 / gigajoule
GSCSRG	Price for all domestic gas sales to all sectors in energy units (real)	$2017 / gigajoule
Gas emissions from combustion		
GSCPCD	CO_2 emissions from gas-fired generation for public electricity supply	Tonnes CO_2-^{e}
GSCICD	CO_2 emissions from industry gas combustion	Tonnes CO_2-^{e}
GSCSCD	CO_2 emissions from gas combustion	Tonnes CO_2-^{e}

3.2.2. Primary sources of data for gas module

3.2.2.1. Queensland Department of Natural Resources and Mines Historical gas production and reserve spreadsheets

Spreadsheets called Gas Production - Fiscal were sourced from DNRME's Senior Project Officer, Ross Randall. Spreadsheets include data for the period 1964-2015 on production by basin, field and reservoir by year. Spreadsheets are also available from:

https://data.qld.gov.au/dataset/petroleum-and-gas-production-and-reserve-statistics-historical-data

Data is provided at a basin level for:

- Surat Basin
- Cooper-Eromanga Basin
- Denison Basin

Reserve data from the spreadsheets is stated to be between 2002 and 2006, but there is no verification of this.

3.2.2.2. Queensland Department of Natural Resources and Mines' Mineral and Energy Resources Location and Information Network (MERLIN)

Table P1 Quantity and Value of Production by Individual Producer, Unit Value at Mine includes data on average mine sales prices, transport costs and mine-head value. Table P1 was extracted by DNRM's Kathryn Keir.

Details and frequency of data available include:

- Quantity produced, by mine, in physical units (1997-2012)
- Quantity sold, by mine, in physical units (1997-2012)
- Value of sales, by mine, in Australian $ (1997-2012)
- Value of production at mine, in Australian $ (1997-2012)

This report is helpful in establishing prices for domestic and interstate sales. Unfortunately contributions to the system by miners declined after 2009 rendering the system less useful. According to QDNRM's Annual Report 2015-16, the MERLIN system is on a pathway to being decommissioned.

3.2.2.3. Queensland Department of Mines (QDM) Annual Reports

QDM Annual Reports were published for the years 1877-2008. The reports are available under the heading of Annual Report Series from:

https://www.dnrm.qld.gov.au/__data/assets/pdf_file/0003/188625/qdex-index-collections.pdf

Details and frequency of data available include:

- Total production of gas, in physical units (1970-90)
- Total value of gas produced at mine-head, in Australian $ (1970-90)
- Gas reserves, in physical unit (1970-89)

Total value and kilolitres of gas produced provides a mine-head value to estimate the value of gas produced as related to the production reported by QDNRM's Historical Gas Reserve and Production data.

3.2.2.4. Queensland Year Book (QYB)

QYB provides data on all activities within Queensland for the period 1901-2001, although publication was not always annual. The reports are available from the Australian Bureau of Statistics at:

http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/1301.3Main+Features11901?OpenDocument

Details and frequency of data available include:

- Total production of gas, in physical units (1970-96)
- Total value of gas produced at mine-head, in Australian $ (1970-96)
- Employment in gas supply (1970, 72, 75, 78, 80-84)

3.2.2.5. Australian Energy Statistics (AES)

Table F of AES provides data on consumption of energy from 1974 to 2017. AES can be found at:

https://www.energy.gov.au/government-priorities/energy-data/australian-energy-statistics

Details and frequency of data available include:

- Consumption of natural gas, by state, by industry for 1974-2017

3.2.2.6. Queensland Historical Economy Tables 1860-2008 (QHT-E)

QHT-E provides value of gas exports and imports including the years 1970-2008. QHT-E is available from:

http://www.qgso.qld.gov.au/products/tables/historical-tables-economy/

Details and frequency of data available include:

- Total value of gas exports, in Australian $ (1988-2008)

Note: Gas exports are reported as having started in 1988 when there is no other evidence that interstate exports began to South Australia before 1994. It is assumed that exports prior to 1994 are for LPG, and included in the oil module.

3.2.2.7. Queensland Government Statisticians Office (QGSO), Commodities exports and imports

Export and import revenue and gross weight 1989-2017, report extracted by QGSO's Andrew Wynn-Jones details revenue and gross weight of gas imports and exports from 1989-2017.

Trade revenue only for 1989-2017 is available from:

http://www.qgso.qld.gov.au/products/tables/trade-tables-interactive/index.php

Note: As with QHT-E, natural gas imports and exports are reported from 1988-89. These 'gas exports' are reported by Port of Brisbane, and should be classified as LPG, not gas.

3.2.2.8. Queensland Department of Transport, Main Roads and Railways (QDTMR): Trade Statistics for Queensland Ports (TSQP)

TSQP provides details by commodity of exports from each Queensland port. The most current version of TSQP is available from:

https://www.tmr.qld.gov.au/Business-industry/Transport-sectors/Ports/Trade-statistics-for-Queensland-ports.aspx

TMR's Robyn Green made available historic TSQP's providing a historic data series from 1984-2017. Further detail on Port of Brisbane Statistics were also made available from 1977.

TSQP provided detail on LNG export volumes from Gladstone harbour.

Note: TSQP's provide volumes of port movements but not values.

3.2.2.9. Miscellaneous other sources of data for estimating prices

Prices for interstate and domestic consumption required a number of ad hoc sources of data, including:

- Queensland Gas Engineer and Chief Gas Examiner Reports 1970-85 (QGE)
  Sourced from Queensland State Library
- Electricity and Gas Operations Australia (ABS Catalogue 8208.0)
  http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/8208.0Main+Features11999-2000?OpenDocument
- National Energy Survey: Household Energy Consumption 1982/83-1985/86 (NES)
  Sourced from University of Queensland Library
- APT Pipelines RBP revised access arrangement - September 2000
  https://www.aer.gov.au/system/files/APTPPLs%20revised%20access%20arrangement%20-%20September%202002.pdf
- Industry Commission, Australian Gas Industry and Markets, 1995 (AGIM)
  https://www.pc.gov.au/research/supporting/gas
- Gas distribution tariff schedules
  https://web.archive.org/web/20110222202144/http:/www.qca.org.au/gas/reference-tariffs/tariffschedules.php

https://www.australiangasnetworks.com.au/our-business/regulatory-information/tariffs-and-plans
https://www.apa.com.au/our-services/gas-distribution/allgas-gas-distribution-network/

- Gas distribution Access Arrangement Decisions and supporting documentation
  - 2001 Access review
    https://web.archive.org/web/20110312193602/http://www.qca.org.au/gas/2000-01-access-review/
  - 2006 Access review
    https://web.archive.org/web/20110310150642/http://www.qca.org.au/gas/2006-access-review/
  - 2011 Access review
    https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/allgas-energy-apt-allgas-access-arrangement-2011-16/final-decision
    https://www.aer.gov.au/networks-pipelines/determinations-access-arrangements/envestra-qld-gas-network-access-arrangement-2011-16/final-decision
- Light Regulation of Queensland gas distribution networks Final Decisions
  - ALLGAS
    http://ncc.gov.au/application/application-for-light-regulation-of-the-allgas-gas-distribution-network/5
  - ENVESTRA
    http://ncc.gov.au/application/application-for-light-regulation-of-envestras-queensland-gas-distribution-n/5
- Cost of gas supply for a second tier retailer supplying small customers in Queensland, MMA, November 2008 (MMA-G 2008)
  https://web.archive.org/web/20110222214351/http://www.qca.org.au/gas-retail/RSCGPComp/
- ACIL Tasman Fuel resource, new entry and generation costs in the NEM 2007
  Sourced from personal collection
- ACIL Tasman Fuel resource, new entry and generation costs in the NEM 2009
  https://www.aemo.com.au/media/Files/Other/planning/419-0035%20pdf.pdf
- ACIL Allen Fuel and Technology Cost Review 2014
  https://www.aemo.com.au/-/media/Files/PDF/Fuel_and_Technology_Cost_Review_Report_ACIL_Allen.pdf
- Frontier Economics: AEMC Assumptions Workbook 2017
  Sourced from Department of Energy
- Oakley Greenwood: Gas Price Trends Review 2017
  https://www.energy.gov.au/publications/gas-price-trends-review-report
- Australian Petroleum Statistics
  https://www.energy.gov.au/government-priorities/energy-data/australian-petroleum-statistics
- AGL spreadsheet entitled AGL QLD gas prices from 2007
  Supplied by Meng Goh of AGL to Paul Simshauser

Details of how source data is used to estimate gas prices, can be found in Section 4.2.

3.2.2.10. Electricity Supply Association of Australia–Electricity Gas Australia (ESAA-EGA)

ESAA-EGA details retail customer numbers and consumption of gas in 2 customer classes, namely small residential, commercial and industrial and large commercial and industrial from table entitled:

Natural gas distribution connections and consumption for 2011-17

ESAA also details natural gas consumed by principal generators from 1970-2018

Data can be found at:

https://www.energycouncil.com.au

3.2.2.11. *Australian Greenhouse Emissions Information System (AGEIS)*

Greenhouse emissions from the combustion of fuels are reported annually in AGEIS from 1990-2016. The data is reported by state and by fuel source, and can be found at:

http://ageis.climatechange.gov.au/

3.2.2.12. *Australian Bureau of Statistics (ABS): Series 6291.0.55.003 - EQ06*

Series 6291.0.55.003 – Table 06 - Employed persons by industry group, details employment by state by industry group. Of particular interest for gas supply, is employment for ANZSIC code 270. This detail is available from:

http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6291.0.55.003Aug%202017?OpenDocument

Details and frequency of data available include:

- Employment in gas supply, quarterly (1985-2017)

Employment data is sourced from the May quarter for each year, where available. If not available for the May quarter, then data is sourced from the nearest available quarter for that year.

Note: Gas supply employment numbers are very volatile, and should be treated with some caution.

3.2.3. Cross reference data for gas module

3.2.3.1. *Australian Energy Statistics (AES)*

Australian Energy Statistics provides data on production and consumption of energy by state from 1974 to 2017. AES can be found at:

https://www.energy.gov.au/government-priorities/energy-data/australian-energy-statistics

AES does not provide data on reserves, exports, prices, employment or emission data. There are small discrepancies (except for 1988-89) between production reported in QDNRM publications and AES.

3.2.3.2. *Electricity Supply Association of Australia (ESAA)*

ESAA provides data on fuel consumed by electricity power stations for 1955-2016. ESAA has now been reformed and called Australian Energy Council. Reports from 2015 can be found at:

https://www.energycouncil.com.au/

and on request from Australian Energy Council for earlier years, although changes in systems mean that power station detail is only available from 2005 onwards. The full series of ESAA was sourced from personal collections.

There is some doubt that ESAA reporting of gas consumption is accurate as commissioning of gas plant in Queensland do not appear to register greater consumption with ESAA. AES is therefore chosen as a more reliable source of consumption data.

ESAA-EGA also provides retail gas customer numbers and consumption but unfortunately not in useful sectoral detail.

3.2.3.3. National Greenhouse and Energy Reporting (NGER)

Access to NGER is restricted and controlled by the Clean Energy Regulator (CER). For the purposes of QEDB, the CER provided access to NGER data for Queensland to the Analytics group within the Queensland Department of Energy (QDE).

Production, consumption and emissions data from NGER was cross-referenced to QEDB data and in some cases used to complete series for QEDB.

3.3. Oil data

3.3.1. Structure of QEDB oil data

Following the data structure as detailed in Section 2, the data series provided in QEDB for oil products are the follows:

Data Series Name (DSN)	Data Series Description	Unit
Petroleum Product reserves		
PCRIPU	Condensate reserves in physical units	Million Litres
PCRIGJ	Condensate reserves in energy units	Gigajoules
PCRIKG	Factor to convert condensate reserves from physical units to energy units	Gigajoules / Litre
PLRIPU	Liquid Petroleum Gas reserves in physical units	Million Litres
PLRIGJ	Liquid Petroleum Gas reserves in energy units	Gigajoules
PLRIKG	Factor to convert Liquid Petroleum Gas reserves from physical units to energy units	Gigajoules / Litre
PORIPU	Crude oil reserves in physical units	Million Litres
PORIGJ	Crude oil reserves in energy units	Gigajoules
PORIKG	Factor to convert crude oil reserves from physical units to energy units	Gigajoules / Litre
PPRIKG	All liquid Petroleum Products reserves in physical units	Million litres
PPRIGJ	All liquid Petroleum Products reserves in energy units	Gigajoules
PPRIKG	Factor to convert all liquid Petroleum Products reserves from physical units to energy units	Gigajoules / Litre
Petroleum Product production		
PCPRPU	Condensate production in physical units	Million Litres
PLPRPU	Liquid Petroleum Gas production in physical units	Million Litres

Data Series Name (DSN)	Data Series Description	Unit
POPRPU	Crude oil production in physical units	Million Litres
PPPRPU	All liquid Petroleum Products production in physical units	Million Litres
PCPRGJ	Condensate production in energy units	Gigajoules
PLPRGJ	Liquid Petroleum Gas production in energy units	Gigajoules
POPRGJ	Crude oil production in energy units	Gigajoules
PPPRGJ	All liquid Petroleum Products production in energy units	Gigajoules
PCPRKG	Factor to convert condensate production from physical units to energy units	Gigajoules / Litre
PLPRKG	Factor to convert Liquid Petroleum Gas production from physical units to energy units	Gigajoules / Litre
POPRKG	Factor to convert Crude Oil production from physical units to energy units	Gigajoules / Litre
PPPRKG	Factor to convert all liquid Petroleum Products production from physical units to energy units	Gigajoules / Litre
PPPRDV	Value of liquid Petroleum Products production at mine head (nominal)	$ millions
PPPRDG	Price of liquid Petroleum Products production at mine head in energy units (nominal)	$ / gigajoule
PPPIDV	Royalty payments for all petroleum (including natural gas) production (nominal)	$ millions
PPPRRV	Value of liquid Petroleum Products production at mine head (real)	$2017 millions
PPPRRG	Price of liquid Petroleum Products production at mine head in energy units (real)	$2017 / gigajoule
PPPIRV	Royalty payments for all petroleum (including natural gas) production (real)	$2017 millions
Petroleum Product international trade		
PPEIPU	All Petroleum Product international sales in physical units	Tonnes
PPEIGJ	All Petroleum Product international sales in energy units	Gigajoules
PPEIKG	Factor to convert Petroleum Product international sales from physical units to energy units	Gigajoules / tonne

Data Series Name (DSN)	Data Series Description	Unit
PPIIPU	All Petroleum Product international purchases in physical units	Tonnes
PPIIGJ	All Petroleum Product international purchases in energy units	Gigajoules
PPIIKG	Factor to convert Petroleum Product international purchases from physical units to energy units	Gigajoules / tonne
PPEIDV	Value of Petroleum Product international sales (nominal)	$ millions
PPEIDG	Price for Petroleum Product international sales in energy units (nominal)	$ / gigajoule
PPIIDV	Value of Petroleum Product international purchases (nominal)	$ millions
PPIIDG	Price for Petroleum Product international purchases in energy units (nominal)	$ / gigajoule
PPEIRV	Value of Petroleum Product international sales (real)	$2017 millions
PPEIRG	Price for Petroleum Product international sales in energy units (real)	$2017 / gigajoule
PPIIRV	Value of Petroleum Product international purchases (real)	$2017 millions
PPIIRG	Price for Petroleum Product international purchases in energy units (real)	$2017 / gigajoule
Petroleum Product consumption		
PPCCPU	Petroleum Products domestic sales to commercial sector in physical units	Million Litres
PPCPPU	Petroleum Products domestic sales to electric power sector in physical units	Million Litres
PPCIPU	Petroleum Products domestic sales to industrial customers in physical units	Million Litres
PPCRPU	Petroleum Products domestic sales to residential sector in physical units	Million Litres
PPCTPU	Petroleum Products domestic sales to transportation sector in physical units	Million Litres
PPCSPU	Petroleum Products domestic sales in physical units	Million Litres
PPCCGJ	Petroleum Products domestic sales to commercial sector in energy units	Gigajoules
PPCPGJ	Petroleum Products domestic sales to electric power sector in energy units	Gigajoules

Data Series Name (DSN)	Data Series Description	Unit
PPCIGJ	Petroleum Products domestic sales to industrial customers in energy units	Gigajoules
PPCRGJ	Petroleum Products domestic sales to residential sector in energy units	Gigajoules
PPCTGJ	Petroleum Products domestic sales to transportation sector in energy units	Gigajoules
PPCSGJ	All Petroleum Products domestic sales in energy units	Gigajoules
PPCSKG	Factor to convert domestic gas consumption for all sectors from physical units to energy units	Gigajoules / Litre
PPCCDV	Value of domestic Petroleum Products sales to commercial sector (nominal)	$ millions
PPCPDV	Value of domestic Petroleum Products sales to electric power sector (nominal)	$ millions
PPCIDV	Value of domestic Petroleum Products sales to industrial sector (nominal)	$ millions
PPCRDV	Value of domestic Petroleum Products sales to residential sector (nominal)	$ millions
PPCTDV	Value of domestic Petroleum Products sales to transport sector (nominal)	$ millions
PPCSDV	Value of all domestic Petroleum Products sales to all sectors (nominal)	$ millions
PPCCDG	Price for domestic Petroleum Products sales to commercial sector in energy units (nominal)	$ / gigajoule
PPCPDG	Price for domestic Petroleum Products sales to electric power sector in energy units (nominal)	$ / gigajoule
PPCIDG	Price for domestic Petroleum Products sales to industrial sector in energy units (nominal)	$ / gigajoule
PPCRDG	Price for domestic Petroleum Products sales to residential sector in energy units (nominal)	$ / gigajoule
PPCTDG	Price for domestic Petroleum Products sales to transport sector in energy units (nominal)	$ / gigajoule
PPCSDG	Price for all domestic Petroleum Products sales to all sectors in energy units (nominal)	$ / gigajoule

Data Series Name (DSN)	Data Series Description	Unit
PPCCRV	Value of domestic Petroleum Products sales to commercial sector (real)	$2017 millions
PPCPRV	Value of domestic Petroleum Products sales to electric power sector (real)	$2017 millions
PPCIRV	Value of domestic Petroleum Products sales to industrial sector (real)	$2017 millions
PPCRRV	Value of domestic Petroleum Products sales to residential sector (real)	$2017 millions
PPCTRV	Value of domestic Petroleum Products sales to transport sector (real)	$2017 millions
PPCSRV	Value of all domestic Petroleum Products sales to all sectors (real)	$2017 millions
PPCCRG	Price for domestic Petroleum Products sales to commercial sector in energy units (real)	$2017 / gigajoule
PPCPRG	Price for domestic Petroleum Products sales to electric power sector in energy units (real)	$2017 / gigajoule
PPCIRG	Price for domestic Petroleum Products sales to industrial sector in energy units (real)	$2017 / gigajoule
PPCRRG	Price for domestic Petroleum Products sales to residential sector in energy units (real)	$2017 / gigajoule
PPCTRG	Price for domestic Petroleum Products sales to transport sector in energy units (real)	$2017 / gigajoule
PPCSRG	Price for all domestic Petroleum Products sales to all sectors in energy units (real)	$2017 / gigajoule
Emissions from combustion of petroleum products		
PPCPCD	CO_2 emissions from oil-fired generation for public electricity supply	Tonnes CO_2-^{e}
PPCICD	CO_2 emissions from industry petroleum product combustion	Tonnes CO_2-^{e}
PPCSCD	CO_2 emissions from petroleum product combustion	Tonnes CO_2-^{e}

3.3.2. Primary sources of data for oil module

3.3.2.1. Queensland Department of Natural Resources and Mines Historical liquid fuels production and reserve spreadsheets

Spreadsheets called Oil Production – Fiscal, LPG Production – Fiscal and Condensate Production - Fiscal were sourced from QDNRME's Ross Randall. Spreadsheets include data for the period 1964-2015 on production by basin, field and reservoir by year. Spreadsheets are also available from:

https://data.qld.gov.au/dataset/petroleum-and-gas-production-and-reserve-statistics-historical-data

Data is provided at a basin level for:

- Surat Basin
- Cooper-Eromanga Basin
- Denison Basin

Reserve data from the spreadsheets is stated to be between 2002 and 2006, but there is no verification of this.

3.3.2.2. Queensland Department of Natural Resources and Mines' Mineral and Energy Resources Location and Information Network (MERLIN)

Table P1 Quantity and Value of Production by Individual Producer, Unit Value at Mine includes data on average mine sales prices, transport costs and mine-head value. Table P1 was extracted by QDNRM's Kathryn Keir.

Details and frequency of data available include:

- Quantity produced, by mine, in physical units (1997-2012)
- Quantity sold, by mine, in physical units (1997-2012)
- Value of sales, by mine, in Australian $ (1997-2012)
- Value of production at mine, in Australian $ (1997-2012)

This report is helpful in establishing prices. Unfortunately contributions to the system by miners appears to decline after 2009 rendering the system less useful. According to QDNRM's Annual Report 2015-16, the MERLIN system is on a pathway to being decommissioned.

3.3.2.3. Queensland Department of Mines (QDM) Annual Reports

QDM Annual Reports were published for the years 1877-2008. The reports are available under the heading of Annual Report Series from:

https://www.dnrm.qld.gov.au/__data/assets/pdf_file/0003/188625/qdex-index-collections.pdf

Details and frequency of data available include:

- Total production of crude oil and LPG, in physical units (1970-90)
- Total value of crude oil and LPG produced at mine-head, in Australian $ (1970-90)
- Petroleum reserves, in physical unit (1970-89)
- All petroleum products (including natural gas) royalties paid to Queensland government (1970-88)

Total value and kilolitres of crude oil and LPG produced provides a mine-head value to estimate the value of liquid fuels produced as related to the production reported by QDNRM's Historical Oil Reserve and Production data.

3.3.2.4. *Queensland Year Book (QYB)*

QYB provides data on all activities within Queensland for the period 1901-2001, although publication was not always annual. The reports are available from the Australian Bureau of Statistics at:

http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/1301.3Main+Features11901?OpenDocument

Details and frequency of data available include:

- Total production of crude oil and LPG, in physical units (1970-96)
- Total value of crude oil and LPG produced at mine-head, in Australian $ (1970-96)
- Employment in petroleum extraction (1978-84)
- Oil exports (1970-76)and imports (1970-84)

3.3.2.5. *Australian Energy Statistics (AES)*

Table F of AES provides data on consumption of energy from 1974 to 2017. AES can be found at:

https://www.energy.gov.au/government-priorities/energy-data/australian-energy-statistics

Details and frequency of data available include:

- Consumption of petroleum products and LPG, by state, by industry and by detailed fuel types for 1974-2017

3.3.2.6. *Queensland Treasury, Spreadsheet from Queensland Office of State Revenue (QOSR): Summary of royalty revenue*

Spreadsheet details royalties received for coal, petroleum, and Other in Australian $ from fiscal year 1988-89 to 2016-17.

Spreadsheet received from James Moore in the Royalty Division of QOSR in QT in email to Lynette Molyneaux, dated 8 June 2018.

3.3.2.7. *Queensland Historical Economy Tables 1860-2008 (QHT-E)*

QHT-E provide value of oil exports and imports including the years 1970-2008. QHT-E are available from:

http://www.qgso.qld.gov.au/products/tables/historical-tables-economy/

Details and frequency of data available include:

- Value of oil exports, in Australian $ (1970-2008)

Note: Oil export prices show volatility and should be treated with caution.

3.3.2.8. *Queensland Government Statisticians Office (QGSO), Commodities exports and imports*

Export value and gross weight 1989-2017, report extracted by QGSO Economics and Fiscal Coordination Statistician, Andrew Wynn-Jones, details value and gross weight of oil exports from 1989-2017. **Import value 2005-2017 and gross weight 1989-2017,** report extracted by Andrew Wynn-Jones, details value and gross weight of oil imports. Trade values only for 1989-2017 is available from:

http://www.qgso.qld.gov.au/products/tables/trade-tables-interactive/index.php

Note: There is evidence of some volatility in export prices before 1983. It is possible that ABS has removed data due to commercial confidentiality, although no evidence of inclusion on the List of Confidential Commodities can be found. Prices for exports in the early years should be treated with caution.

3.3.2.9. Queensland Department of Transport, Main Roads and Railways (QDTMR): Trade Statistics for Queensland Ports (TSQP)

TSQP provides details by commodity of exports from each Queensland port. The most current version of TSQP is available from:

https://www.tmr.qld.gov.au/Business-industry/Transport-sectors/Ports/Trade-statistics-for-Queensland-ports.aspx

QDTMR Ports and Transport Governance Unit's Robyn Green made available historic TSQP's providing a historic data series from 1984-2017. Further detail on Port of Brisbane Statistics were also made available from 1977.

Note: TSQP's provide volumes of port movements but not values.

3.3.2.10. Miscellaneous other sources of data for estimating prices

Verifying interstate and domestic consumption requires a number of ad hoc sources of data, including:

- International Energy Agency: Energy Prices and Taxes Statistics - Crude Oil Spot Prices
  http://www.iea.org/statistics/topics/pricesandtaxes/
- Garget, 2017: Bureau of Infrastructure, Transport and Regional Economics, Petrol and Diesel Prices in Australia, BITRE, Canberra – estimates based on regression analysis
  https://bitre.gov.au/publications/2017/files/is_082.pdf
- Queensland Government Statisticians Office, Historical Petrol Prices
  http://www.qgso.qld.gov.au/products/tables/petrol-avg-retail-price-type-bris/index.php
- Australian Institute of Petroleum, AIP Annual Retail Price Data
  https://aip.com.au/aip-annual-retail-price-data
- Australian Institute of Petroleum, Historical ULP and Diesel TGP Data
  https://aip.com.au/historical-ulp-and-diesel-tgp-data
- Reserve Bank of Australia, Exchange rate files
  https://www.rba.gov.au/statistics/historical-data.html
- Australian Energy Statistics Tables M & N (Exports) coupled with ABS Series 5368 Tables 12B & 13B (Exports)
  https://www.energy.gov.au/publications/australian-energy-update-2017
  http://abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/5368.0Mar%202018?OpenDocument
- RACQ Annual Fuel Price Report 2017
  https://www.racq.com.au/-/media/racq/pdf/cars-and-driving/fuel-price-report/annual-fuel-price-report-2017.ashx?la=en&hash=28589FF28CAC9767E507DD08270B61D8653C7B7C

Details of how source data was used to estimate oil prices, can be found in Section 4.3.

3.3.2.11. Australian Greenhouse Emissions Information System (AGEIS)

Greenhouse emissions from the combustion of fuels are reported annually in AGEIS from 1990-2016. The data is reported by state and by fuel source, and can be found at:

http://ageis.climatechange.gov.au/

3.3.2.12. Australian Bureau of Statistics: Series 6291.0.55.003 - EQ06

Series 6291.0.55.003 – Table 06 - Employed persons by industry group, details employment by state by industry group. Of particular interest for petroleum, oil and gas extraction, is employment for ANZSIC code 070. This detail is available from:

http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6291.0.55.003Aug%202017?OpenDocument

Details and frequency of data available include:

- Employment in oil and gas extraction, quarterly (1985-2017)

Employment data is sourced from the May quarter for each year, where available. If not available for the May quarter, then data is sourced from the nearest available quarter for that year.

Note: Oil and gas extraction employment numbers are very volatile, and should be treated with some caution.

3.3.3. Cross reference data for oil module

3.3.3.1. Australian Energy Statistics (AES)

Table I from AES provides data on production of primary fuel sources by state from 1961 to 2017. AES can be found at:

https://www.energy.gov.au/government-priorities/energy-data/australian-energy-statistics

AES does not provide data on reserves, exports, prices, employment or emission data.

Note: There are very significant discrepancies (11-44% QDNRM larger than AES for 1994-2006, and 7-148% QDNRM smaller than AES for 2007-17) between oil production reported in QDNRM publications and AES. This has implications for royalty income for Queensland. AES team members are unable to shed light on the cause of discrepancies. It is suggested that a more detailed investigation be initiated to understand the origin of discrepancies between QDNRM and AES reporting.

3.3.3.2. Electricity Supply Association of Australia (ESAA)

ESAA provides data on fuel consumed by electricity power stations for 1955-2017. ESAA has now been reformed and called Australian Energy Council. Reports from 2015 can be found at:

https://www.energycouncil.com.au/

and on request from Australian Energy Council for earlier years. The full series of ESAA was sourced from personal collections.

Note: There is significant discrepancy between ESAA reporting of oil consumption and that of AES. It is suspected that the reason for the discrepancy is electricity generation by non-public electricity generators, in line with notes to Table F. As AES is the source of Australian statistics, it is chosen as the preferential source of data. It is suggested that it would be useful to initiate an exercise with ESAA to understand the difference between the 2 publications.

3.3.3.3. *National Greenhouse and Energy Reporting (NGER)*

Access to NGER is restricted and controlled by the Clean Energy Regulator (CER). For the purposes of QEDB, the CER provided access to NGER data for Queensland to the Analytics group within the Queensland Department of Energy (QDE).

Extracting reliable reports on consumption and emissions data from NGER has proved to be challenging, so there is little ability to cross-reference and complete data gaps for the period 2016-17. It is hoped that these gaps can be closed once reliable reports are designed.

Note: Current estimations for CO_2 emissions from combustion of petroleum products for 1970-89 and 2016-17 for QEDB, are not considered accurate enough and need to be reworked.

3.4. Electricity data

3.4.1. Structure of QEDB electricity data

Data Series Name (DSN)	Data Series Description	Unit
Electricity generating capacity		
CLERPU	Electricity generation capacity for public supply from thermal coal	Megawatts
GSERPU	Electricity generation capacity for public supply from gas	Megawatts
OTERPU	Electricity generation capacity for public supply from miscellaneous fuels	Megawatts
PPERPU	Electricity generation capacity for public supply from petroleum products	Megawatts
RFERPU	Electricity generation capacity for public supply from biofuels	Megawatts
RGERPU	Electricity generation capacity for public supply from geothermal sources	Megawatts
RHERPU	Electricity generation capacity for public supply from hydro sources	Megawatts
RPERPU	Electricity generation capacity for public supply from solar photovoltaic	Megawatts
RSERPU	Electricity generation capacity for public supply from solar thermal sources	Megawatts
RWERPU	Electricity generation capacity for public supply from wind turbines	Megawatts
ROERPU	Electricity generation capacity for public supply from other renewable sources	Megawatts
TEERPU	All generation capacity for public supply	Megawatts

Data Series Name (DSN)	Data Series Description	Unit
CLARPU	Electricity generation capacity for private supply from thermal coal	Megawatts
GSARPU	Electricity generation capacity for private supply from gas	Megawatts
OTARPU	Electricity generation capacity for private supply from miscellaneous fuels	Megawatts
PPARPU	Electricity generation capacity for private supply from petroleum products	Megawatts
RFARPU	Electricity generation capacity for private supply from biofuels	Megawatts
RGARPU	Electricity generation capacity for private supply from geothermal sources	Megawatts
RHARPU	Electricity generation capacity for private supply from hydro sources	Megawatts
RPARPU	Electricity generation capacity for private supply from solar photovoltaic	Megawatts
RSARPU	Electricity generation capacity for private supply from solar thermal sources	Megawatts
RWARPU	Electricity generation capacity for private supply from wind turbines	Megawatts
ROARPU	Electricity generation capacity for private supply from other renewable sources	Megawatts
TEARPU	All generation capacity for private supply	Megawatts
Electricity production		
CLEPPU	Electricity for public use generated from coal in physical units	Gigawatt hours
GSEPPU	Electricity for public use generated from gas in physical units	Gigawatt hours
OTEPPU	Electricity for public use generated from miscellaneous fuels in physical units	Gigawatt hours
PPEPPU	Electricity for public use generated from petroleum products in physical units	Gigawatt hours
RFEPPU	Electricity for public use generated from biofuels in physical units	Gigawatt hours
RGEPPU	Electricity for public use generated from geothermal sources in physical units	Gigawatt hours

Data Series Name (DSN)	Data Series Description	Unit
RHEPPU	Electricity for public use generated from hydro sources in physical units	Gigawatt hours
RPEPPU	Electricity for public use generated from solar photovoltaic in physical units	Gigawatt hours
RSEPPU	Electricity for public use generated from solar thermal sources in physical units	Gigawatt hours
RWEPPU	Electricity for public use generated from wind turbines in physical units	Gigawatt hours
ROEPPU	Electricity for public use generated from other renewable sources in physical units	Gigawatt hours
TEEPPU	Electricity for public use generated from all sources in physical units	Gigawatt hours
TEEPDV	Value of public electricity generated (nominal)	$ millions
TEEPDP	Wholesale price of public electricity generated (nominal)	$ / MWh
TEEPRV	Value of public electricity generated (real)	$2017 millions
TEEPRP	Wholesale price of public electricity generated (real)	$2017 / MWh
CLAPPU	Electricity for private use generated from coal in physical units	Gigawatt hours
GSAPPU	Electricity for private use generated from gas in physical units	Gigawatt hours
OTAPPU	Electricity for private use generated from miscellaneous fuels in physical units	Gigawatt hours
PPAPPU	Electricity for private use generated from petroleum products in physical units	Gigawatt hours
RFAPPU	Electricity for private use generated from biofuels in physical units	Gigawatt hours
RGAPPU	Electricity for private use generated from geothermal sources in physical units	Gigawatt hours
RHAPPU	Electricity for private use generated from hydro sources in physical units	Gigawatt hours
RPAPPU	Electricity for private use generated from solar photovoltaic in physical units	Gigawatt hours
RSAPPU	Electricity for private use generated from solar thermal sources in physical units	Gigawatt hours

Data Series Name (DSN)	Data Series Description	Unit
RWAPPU	Electricity for private use generated from wind turbines in physical units	Gigawatt hours
ROAPPU	Electricity for private use generated from other renewable sources in physical units	Gigawatt hours
TEAPPU	Electricity for private use generated from all sources in physical units	Gigawatt hours
CLEPGJ	Electricity for public use generated from coal in energy units	Gigajoules
GSEPGJ	Electricity for public use generated from gas in energy units	Gigajoules
OTEPGJ	Electricity for public use generated from miscellaneous fuels in energy units	Gigajoules
PPEPGJ	Electricity for public use generated from petroleum products in energy units	Gigajoules
RFEPGJ	Electricity for public use generated from biofuels in energy units	Gigajoules
RGEPGJ	Electricity for public use generated from geothermal sources in energy units	Gigajoules
RHEPGJ	Electricity for public use generated from hydro sources in energy units	Gigajoules
RPEPGJ	Electricity for public use generated from solar photovoltaic in energy units	Gigajoules
RSEPGJ	Electricity for public use generated from solar thermal sources in energy units	Gigajoules
RWEPGJ	Electricity for public use generated from wind turbines in energy units	Gigajoules
ROEPGJ	Electricity for public use generated from other renewable sources in energy units	Gigajoules
TEEPGJ	Electricity for public use generated from all sources in energy units	Gigajoules
CLAPGJ	Electricity for private use generated from coal in energy units	Gigajoules
GSAPGJ	Electricity for private use generated from gas in energy units	Gigajoules
OTAPGJ	Electricity for private use generated from miscellaneous fuels in energy units	Gigajoules
PPAPGJ	Electricity for private use generated from petroleum products in energy units	Gigajoules

Data Series Name (DSN)	Data Series Description	Unit
RFAPGJ	Electricity for private use generated from biofuels in energy units	Gigajoules
RGAPGJ	Electricity for private use generated from geothermal sources in energy units	Gigajoules
RHAPGJ	Electricity for private use generated from hydro sources in energy units	Gigajoules
RPAPGJ	Electricity for private use generated from solar photovoltaic in energy units	Gigajoules
RSAPGJ	Electricity for private use generated from solar thermal sources in energy units	Gigajoules
RWAPGJ	Electricity for private use generated from wind turbines in energy units	Gigajoules
ROAPGJ	Electricity for private use generated from other renewable sources in energy units	Gigajoules
TEAPGJ	Electricity for private use generated from all sources in energy units	Gigajoules
Electricity sent-out		
CLESPU	Electricity for public use sent-out from coal in physical units	Gigawatt hours
GSESPU	Electricity for public use sent-out from gas in physical units	Gigawatt hours
OTESPU	Electricity for public use sent-out from miscellaneous fuels in physical units	Gigawatt hours
PPESPU	Electricity for public use sent-out from petroleum products in physical units	Gigawatt hours
RFESPU	Electricity for public use sent-out from biofuels in physical units	Gigawatt hours
RGESPU	Electricity for public use sent-out from geothermal sources in physical units	Gigawatt hours
RHESPU	Electricity for public use sent-out from hydro sources in physical units	Gigawatt hours
RPESPU	Electricity for public use sent-out from solar photovoltaic in physical units	Gigawatt hours
RSESPU	Electricity for public use sent-out from solar thermal sources in physical units	Gigawatt hours
RWESPU	Electricity for public use sent-out from wind turbines in physical units	Gigawatt hours

Data Series Name (DSN)	Data Series Description	Unit
ROESPU	Electricity for public use sent-out from other renewable sources in physical units	Gigawatt hours
TEESPU	Electricity for public use sent-out from all sources in physical units	Gigawatt hours
CLASPU	Electricity for private use sent-out from coal in physical units	Gigawatt hours
GSASPU	Electricity for private use sent-out from gas in physical units	Gigawatt hours
OTASPU	Electricity for private use sent-out from miscellaneous fuels in physical units	Gigawatt hours
PPASPU	Electricity for private use sent-out from petroleum products in physical units	Gigawatt hours
RFASPU	Electricity for private use sent-out from biofuels in physical units	Gigawatt hours
RGASPU	Electricity for private use sent-out from geothermal sources in physical units	Gigawatt hours
RHASPU	Electricity for private use sent-out from hydro sources in physical units	Gigawatt hours
RPASPU	Electricity for private use sent-out from solar photovoltaic in physical units	Gigawatt hours
RSASPU	Electricity for private use sent-out from solar thermal sources in physical units	Gigawatt hours
RWASPU	Electricity for private use sent-out from wind turbines in physical units	Gigawatt hours
ROASPU	Electricity for private use sent-out from other renewable sources in physical units	Gigawatt hours
TEASPU	Electricity for private use sent-out from all sources in physical units	Gigawatt hours
CLESGJ	Electricity for public use sent-out from coal in energy units	Gigajoules
GSESGJ	Electricity for public use sent-out from gas in energy units	Gigajoules
OTESGJ	Electricity for public use sent-out from miscellaneous fuels in energy units	Gigajoules
PPESGJ	Electricity for public use sent-out from petroleum products in energy units	Gigajoules
RFESGJ	Electricity for public use sent-out from biofuels in energy units	Gigajoules

Data Series Name (DSN)	Data Series Description	Unit
RGESGJ	Electricity for public use sent-out from geothermal sources in energy units	Gigajoules
RHESGJ	Electricity for public use sent-out from hydro sources in energy units	Gigajoules
RPESGJ	Electricity for public use sent-out from solar photovoltaic in energy units	Gigajoules
RSESGJ	Electricity for public use sent-out from solar thermal sources in energy units	Gigajoules
RWESGJ	Electricity for public use sent-out from wind turbines in energy units	Gigajoules
ROESGJ	Electricity for public use sent-out from other renewable sources in energy units	Gigajoules
TEESGJ	Electricity for public use sent-out from all sources in energy units	Gigajoules
CLASGJ	Electricity for private use sent-out from coal in energy units	Gigajoules
GSASGJ	Electricity for private use sent-out from gas in energy units	Gigajoules
OTASGJ	Electricity for private use sent-out from miscellaneous fuels in energy units	Gigajoules
PPASGJ	Electricity for private use sent-out from petroleum products in energy units	Gigajoules
RFASGJ	Electricity for private use sent-out from biofuels in energy units	Gigajoules
RGASGJ	Electricity for private use sent-out from geothermal sources in energy units	Gigajoules
RHASGJ	Electricity for private use sent-out from hydro sources in energy units	Gigajoules
RPASGJ	Electricity for private use sent-out from solar photovoltaic in energy units	Gigajoules
RSASGJ	Electricity for private use sent-out from solar thermal sources in energy units	Gigajoules
RWASGJ	Electricity for private use sent-out from wind turbines in energy units	Gigajoules
ROASGJ	Electricity for private use sent-out from other renewable sources in energy units	Gigajoules

Data Series Name (DSN)	Data Series Description	Unit
TEASGJ	Electricity for private use sent-out from all sources in energy units	Gigajoules
Electricity network		
ESTTPK	Electricity supply: Transmission line length	Circuit kilometres
ESTDPK	Electricity supply: Distribution line length in circuit kms	Circuit kilometres
Employment		
ESJBPU	Persons employed in electricity supply (FTE)	Number
REJBPU	Persons employed in renewable energy sector (FTE)	Number
Electricity consumers		
ESCCCN	Number of commercial sector electricity customers	Number
ESCICN	Number of industry sector electricity customers	Number
ESCRCN	Number of residential sector electricity customers	Number
ESCSCN	Number of all electricity customers in Queensland	Number
Electricity consumption		
ESCCPU	Electricity sales to commercial sector in physical units	Gigawatt hours
ESCIPU	Electricity sales to industrial sector in physical units	Gigawatt hours
ESCRPU	Electricity sales to residential sector in physical units	Gigawatt hours
ESCTPU	Electricity sales to transportation sector in physical units	Gigawatt hours
ESCSPU	All electricity sales in physical units	Gigawatt hours
ESEDPU	Electricity sales interstate in physical units	Gigawatt hours
ESIDPU	Electricity purchases interstate in physical units	Gigawatt hours
ESCPPU	Electricity consumption by power sector in physical units	Gigawatt hours
ESCCGJ	Electricity sales to commercial sector in energy units	Gigajoules
ESCIGJ	Electricity sales to industrial sector in energy units	Gigajoules
ESCRGJ	Electricity sales to residential sector in energy units	Gigajoules
ESCTGJ	Electricity sales to transportation sector in energy units	Gigajoules
ESCSGJ	All electricity sales in energy units	Gigajoules
ESEDGJ	Electricity sales interstate in energy units	Gigajoules

Data Series Name (DSN)	Data Series Description	Unit
ESIDGJ	Electricity purchases interstate in energy units	Gigajoules
ESCPPU	Electricity consumption by power sector in energy units	Gigajoules
ESCCDV	Value of electricity sales to commercial sector	Million $
ESCIDV	Value of electricity sales to industrial sector	Million $
ESCRDV	Value of electricity sales to residential sector	Million $
ESCTDV	Value of electricity sales to transport sector	Million $
ESCSDV	Value of all electricity sales	Million $
ESEDDV	Value of electricity interstate sales	Million $
ESIDDV	Value of electricity interstate purchases	Million $
ESCPDV	Value of electricity consumed onsite by power sector	Million $
ESCCDP	Price of electricity to commercial sector in physical units	$/kilowatt hour
ESCIDP	Price of electricity to industrial sector in physical units	$/kilowatt hour
ESCRDP	Price of electricity to residential sector in physical units	$/kilowatt hour
ESCTDP	Price of electricity to transport sector in physical units	$/kilowatt hour
ESCSDP	Average price of electricity in physical units	$/kilowatt hour
ESEDDP	Price of electricity exports in physical units	$/kilowatt hour
ESIDDP	Price of electricity imports in physical units	$/kilowatt hour
ESCCDG	Price of electricity to commercial sector in energy units	$/Gigajoule
ESCIDG	Price of electricity to industrial sector in energy units	$/Gigajoule
ESCRDG	Price of electricity to residential sector in energy units	$/Gigajoule
ESCTDG	Price of electricity to transport sector in energy units	$/Gigajoule
ESCSDG	Average price of electricity in energy units	$/Gigajoule
ESEDDG	Price of electricity exports in energy units	$/Gigajoule
ESIDDG	Price of electricity imports in energy units	$/Gigajoule
ESCCRV	Value of electricity sales to commercial sector (real)	$2017 millions
ESCIRV	Value of electricity sales to industrial sector (real)	$2017 millions
ESCRRV	Value of electricity sales to residential sector (real)	$2017 millions
ESCTRV	Value of electricity sales to transport sector (real)	$2017 millions

Data Series Name (DSN)	Data Series Description	Unit
ESCSRV	Value of all electricity sales (real)	$2017 millions
ESEDRV	Value of electricity interstate sales (real)	$2017 millions
ESIDRV	Value of electricity interstate purchases (real)	$2017 millions
ESCPRV	Value of electricity consumed onsite by power sector (real)	$2017 millions
ESCCRP	Price of electricity to commercial sector in physical units (real)	$2017/kilowatt hour
ESCIRP	Price of electricity to industrial sector in physical units (real)	$2017/kilowatt hour
ESCRRP	Price of electricity to residential sector in physical units (real)	$2017/kilowatt hour
ESCTRP	Price of electricity to transport sector in physical units (real)	$2017/kilowatt hour
ESCSRP	Average price of electricity in physical units (real)	$2017/kilowatt hour
ESEDRP	Price of electricity exports in physical units (real)	$2017/kilowatt hour
ESIDRP	Price of electricity imports in physical units (real)	$2017/kilowatt hour
ESCCRG	Price of electricity to commercial sector in energy units (real)	$2017/Gigajoule
ESCIRG	Price of electricity to industrial sector in energy units (real)	$2017/Gigajoule
ESCRRG	Price of electricity to residential sector in energy units (real)	$2017/Gigajoule
ESCTRG	Price of electricity to transport sector in energy units (real)	$2017/Gigajoule
ESCSRG	Average price of electricity in energy units (real)	$2017/Gigajoule
ESEDRG	Price of electricity exports in energy units (real)	$2017/Gigajoule
ESIDRG	Price of electricity imports in energy units (real)	$2017/Gigajoule
Conversion to energy units		
ESCSKG	Factor to convert electricity production and consumption from physical units to energy units	Kilowatt hours / gigajoule

Note: Estimations for CO_2 emissions from electricity generation are included in the coal, gas and oil data modules, and not in the electricity generation modules.

3.4.2. Primary sources of data for electricity module

3.4.2.1. State Electricity Commission of Queensland (SECQ) Annual Reports

The majority of data from 1970-76 is sourced from SECQ Annual Reports. The reports are available under the heading of **Queensland Electricity Commission Annual Report Series** from:

https://espace.library.uq.edu.au/records/search?page=1&pageSize=20&sortBy=published_date&sortDirection=Desc&searchQueryParams%5Ball%5D=Queensland+Electricity+Commission+Annual+Report

Details and frequency of data on public supply of electricity detailed in the **Comparative Statistics Appendix**:

- Electricity generation capacity by fuel source in physical units (1970-76)
- Electricity produced by fuel source in physical units (1970-76)
- Electricity sent-out by fuel source in physical units (1970-76)
- Fuel consumed by fuel source in physical units (1970-76)
- Fuel cost for power generation by region in $ (1970-76)
- Electricity purchased in physical units (1970-76)
- Retail consumption by sector in physical units (1970-76)
- Retail consumers by sector in numbers (1970-76)
- Average cost per unit generated and sold (1970-76)
- Average revenue per unit sold (1970-76)
- Personnel employed (1970-76)

These annual reports provide a rich, reliable source of data for the electricity system from 1970-76. In 1977, the electricity supply industry was reorganised. The Electricity Act, 1976, required the State Electricity Commission of Queensland to plan, develop and co-ordinate electricity throughout the State, with electricity generation carried out by the Queensland Electricity Generating Board for bulk supply to 7 distribution boards. The Electricity Boards in turn, assumed responsibility for public supply of electricity from local authorities.

3.4.2.2. Queensland Electricity Generating Board (QEGB) Annual Reports

Generation for public supply data was reported by QEGB. Reports for the period 1977-78 to 1983-84 are available from Queensland State Library at:

http://onesearch.slq.qld.gov.au/primo-explore/fulldisplay?docid=slq_alma21116110780002061&context=L&vid=SLQ&lang=en_US&search_scope=SLQ_PCI_EBSCO&adaptor=Local%20Search%20Engine&tab=all&query=any,contains,queensland%20electricity%20generating%20board%20annual%20report&sortby=rank&offset=0

Data published in QEDB includes:

- Electricity generation capacity by fuel source in physical units (1978-84)
- Electricity sent-out by fuel source in physical units (1978-84)
- Fuel consumed by fuel source in physical units (1978-84)
- Fuel cost of fuel consumed in power generation in Australian $ (1978-84)
- Electricity purchased in physical units (1978-84)
- Bulk sales of electricity in physical units (1978-84)
- Energy Balance (Generation to Sent-out by major facility (1978-84)
- Income from bulk sales of electricity (including and direct connected customers) (1978-84)
- Total cost of generation (1979-84)

- Transmission circuit kms (1979-1984)

Data on sales by distribution boards is generally not detailed in annual reports. In 1985, QEGB and SECQ were amalgamated to form the Queensland Electricity Commission.

3.4.2.3. Queensland Electricity Commission (QEC) Annual Reports

QEC reported on the public supply of all electricity from 1985-94. Annual Reports are available from:

https://espace.library.uq.edu.au/records/search?page=1&pageSize=20&sortBy=published_date&sortDirection=Desc&searchQueryParams%5Ball%5D=Queensland+Electricity+Commission+Annual+Report

From 1985 the QEC Annual Report included an appendix entitled Statistics of Electricity Supply Industry in Queensland 1975-85, which provided much of the data unreported by the distribution boards between 1977 and 1984. Data published in QEC Annual Reports included:

- Electricity generation capacity by fuel source in physical units (1985-94)
- Electricity produced by fuel source in physical units (1985-94)
- Electricity sent-out by fuel source in physical units (1985-94)
- Fuel consumed by fuel source in physical units (1985-94)
- Fuel cost for power generation in Australian $ (1985-94)
- Electricity purchased in physical units (1975-94)
- Energy Balance (Energy Generation to Sent-out by major facility (1985-92))
- Income from bulk sales of electricity (including direct connected customers) (1978-84)
- Retail consumption by sector in physical units (1975-94)
- Retail consumers by sector in numbers (1975-94)
- Average cost per unit generated and sold (1975-94)
- Average revenue per unit sold (1975-94)
- Personnel employed (1975-94)
- Transmission and Distribution circuit kms (1983-1994)

These annual reports provide a rich, reliable source of data for the electricity system from 1985-94.

On 1 January 1995, the electricity supply industry was restructured and corporatized. Two new statutory Government Owned Corporations (GOC) were established. Queensland Transmission and Supply Corporation (QTSC) which was responsible for ensuring adequate, economical, reliable and safe supply of electricity to customers in Queensland. Queensland Generation Corporation (QGC) assumed responsibility for owning, operating and building new GOC generating installations. In 1996 QGC assumed the name AUSTA. QTSC was the holding company for the transmission business unit, Powerlink, and the seven regional electricity former distribution boards, Far North Queensland Electricity Corporation (FNQEC), North Queensland Electricity Corporation (NQEC), Mackay Electricity Corporation (MEC), Capricornia Electricity Corporation (CAPELEC), Wide Bay Burnett Electricity Corporation (WBBEC), South West Queensland Electricity Corporation (SWQEC) and South East Queensland Electricity Corporation (SEQEC).

Before the 1995 restructure had settled, the Queensland government required that GOCs participate in a competitive electricity market from 1 July 1997. This required a re-restructure of the electricity supply industry from a monopolistic to a market-driven industry. Significant downsizing of the electricity industry was considered imperative to survival in a competitive setting. To that end more than $100 million annual savings were achieved by QTSC before the shift to a competitive electricity market. To prepare for the competitive market the QTSC Group was dissolved and reforged as seven Government-owned distribution businesses and three retail businesses. SEQEC, the largest of the

distribution corporations, and its wholly owned retail arm called Southern Electricity Retail Corporation (SERC), changed its name to Energex. Northern Electricity Retail Corporation (NERC) became the wholly owned retail arm of FNQEC, NQEC and MEC. Central Electricity Retail Corporation (CERC) became the wholly owned retail arm of CAPELEC, WBBEC and SWQEC). CS Energy, Tarong Energy and Stanwell, were spun off from Austa Electric to compete in a wholesale energy competitive market.

The Queensland interim market commenced on 18 January 1998 based on the principles of the proposed National Electricity Market (NEM). Queensland generators and retailers started participating in the NEM in December 1998. Queensland Transitional Power Trading Corporation assumed responsibility for managing existing Power Purchase Agreements (including Gladstone Power Station).

As part of the restructuring, retail contestability commenced in Queensland on 29 March 1998. Sixteen retailers registered in Queensland. Forty-three customers who consumed more than 40GWh per annum chose their own retailer. In April 1998, CERC merged with NERC, renaming itself as Ergon Energy, with the intention of creating a regional Queensland electricity retailer. From 1 October four hundred and ninety-two customers who consumed more than 4GWh per annum became eligible to choose their own retailer. Queensland commenced participating in the NEM from December 1998 although no interconnection with New South Wales existed.

During 1999, the six regional distribution corporations merged to form Ergon Energy. AUSTA winding up was completed on 2 July 2000. Roma Gas Turbine was connected to the Ballera-Wallumbilla pipeline. Mica Creek conversion to natural gas was completed in May 1999. 7125 customers who consumed more than 200MWh per annum became eligible to choose their own retailer.

In 2000, the Terranora Interconnector (Directlink) (direct current) was commissioned, comprised of 2x110kV lines from Mudgeeraba in Queensland to Terranora in NSW. Directlink capacity QLD-NSW is 210MW and NSW-QLD is 107MW. The Queensland government announced Queensland Energy Policy - A Cleaner Energy Strategy which sought diversification of energy mix to greater use of gas and renewables. In 2001, Queensland New South Wales Interconnector (QNI) (alternating current) was commissioned, comprised of 2x 330kV lines between Dumaresq in New South Wales and Bulli Creek in Queensland. QLD-NSW capacity was 1078MW, NSW-QLD capacity 300-600MW.

The period from the disestablishment of QEC to the establishment of the current regulatory and oversight structures involved the following changes:

- wholesale market operations were managed by the National Electricity Market Management Company (NEMMCo) from 1996 which shifted to the Australian Energy Market Operator (AEMO) in 2009:
- regulatory oversight of Powerlink by the Queensland Government was moved to the Australian Consumer and Competition Commission (ACCC) in 2002, and then on to the Australian Energy Regulator (AER) in 2005;
- regulatory oversight of distribution corporations by the Queensland Government was moved to the Queensland Competition Authority (QCA) in 1997 and then the AER in 2005; and
- management of NEM rules, NEM compliance monitoring and reporting was vested in the National Electricity Code Administrator (NECA) and moved to the Australian Energy Market Commission (AEMC) in 2005

All of these changes were characterised by a significant loss of data and reliable statistics for the entire Queensland electricity sector. The Electricity Supply Association of Australia (ESAA) collected

some data from all generators and suppliers, but the consistent flow of data that had been the hallmark of the Queensland Electricity Commission disappeared. The flow of data converged around GOCs' Annual Reports which were intentionally corporate rather than detailed. Reporting in Annual Reports became focussed on the industry restructure, corporatisation, participation in competitive markets, credentials of directors and executive officers and risk strategies rather than detail statistical performance.

3.4.2.4. Miscellaneous sources of data from 1994-95 to 2002-03

As stated in the previous section, there was no central reporting of electricity supply data for the period 1994-95 to 2002-03. The generating, network and retail GOCs published annual reports, which usually can be found here:

https://www.parliament.qld.gov.au/work-of-assembly/tabled-papers/online-tabled-papers

Detailed electricity supply information like energy generated by power plant, energy sold by sector and employment were often not detailed in annual reports or inconsistently reported. Data has been estimated and or extrapolated from references made in the following annual reports:

- Austa Electricity
- Queensland Transmission and Supply Corporation
- Far North Queensland Electricity Corporation
- North Queensland Electricity Corporation
- Mackay Electricity Corporation
- Wide Bay Burnett Electricity Corporation
- Capricorn Electricity Corporation
- South West Power
- South East Queensland Electricity Corporation
- Energex
- Ergon
- Powerlink
- CS Energy
- Tarong Energy
- Stanwell
- Paul Simshauser private files (thermal power station generation – excluding Gladstone Power Station) and NEM spot prices for 1998-99

3.4.2.5. Electricity Supply Association of Australia (ESAA)

ESAA provides a continuous series on electricity supply data in Queensland at an aggregated level. The series exists from 1955-2017, and the annual reports for 1997-2017 are available from:

https://www.energycouncil.com.au/

The full data series on electricity includes:

- Total generation by plant type (1955-97)
- Total generation by fuel source (1998-2017) (for principal power stations)
- List of power plants for public electricity supply (1955-2017)
- List of major power plants for private electricity supply / cogeneration (1998-2017)
- Fuel consumed in generating electricity (1955-2017)
- Transmission and distribution circuit kilometres (1969-2017)

- Number of customers by sector (1960-95)
- Total number of residential customers (1955-2017)
- Total consumption by sector (1960-95)
- Consumption by residential customers (1955-2017)
- Capital employed and in progress (1960-94)
- Average and peak load (1989-2017)
- Income from sales of electricity (1965-95)
- Total number of employees (1955-2006)
- Price of electricity by residential, traction, public lighting and combined business/industry (1955-94)
- Energy supply summary from generation to available energy (1989-2017)

Note:

Data is provided in annual reports, not as historical series, so analysis requires considerable resource to convert to historical series.

Discrepancies have been noted on fuel consumption as reported by Australian Energy Statistics and energy generated as reported by AEMO. ESAA have themselves undergone restructure and reorganisation in 2015-16 which has resulted in annual reports and data prior to 2000 no longer available for analysis. ESAA data is used to cross-check data from primary sources, and it is used as a source of electricity prices by sector from 1970-95.

3.4.2.6. Australian Market Energy Operator (AEMO)

3.4.2.6.1. Antony Stone

Queensland Department of Energy, Lead Analyst for the Analytics group within Regulation, Governance and Analytics, Antony Stone, collected data from AEMO for the following:

- Schedulable and semi-schedulable generation by power station (2003-17)
- Schedulable and semi-schedulable generation capacity by power station (2003-17)
- Total annual imports and exports of electricity (2003-17)
- Value of total annual imports and exports of electricity (2003-17)
- Marginal loss factors for 1997-18

Note: AEMO was unable to provide data for the period prior to January 2002.

3.4.2.6.2. AEMO: Historic aggregated price and demand data

Available from:

https://aemo.com.au/Electricity/National-Electricity-Market-NEM/Data-dashboard#aggregated-data
provides an average annual wholesale price.

3.4.2.7. Global-Roam NEMReview

Global-Roam's NEMReview is made available for use by QDE. NEMReview details energy generated by schedulable and semi-schedulable power station from February 1999. Generation by schedulable and semi-schedulable power station is sourced from NEMReview for the years 1999-00 to 2001-02.

3.4.2.8. Queensland Department of Natural Resources and Mines (QDNRM): Queensland Coal Board (QCB) Annual Reports and Queensland Coal Database of monthly and quarterly coal returns (QCD)

There is no data available on the electricity generated by large off-grid power stations at Queensland Alumina and Queensland Nickel for the period prior to 2008-09 when NGER data starts. Data for electricity generated by the coal-fired power station at Mt Isa Mines from 1970 to when it was sold to CS energy in 1997 (some of which was purchased by SECQ for public consumption in Mt Isa), is also not available. Around 2000, Mica Creek was converted to gas. Coal data from QCB and QCD is used to estimate electricity generation from these off-grid resources:

- Coal supplied to Mica Creek, QAL, QNI (1970-2017)

3.4.2.9. Clean Energy Regulator (CER)

3.4.2.9.1. Register of Large-scale generation certificates (LGC)

Available from:

https://www.rec-registry.gov.au/rec-registry/app/public/lgc-register

details energy generated by renewable energy power stations which attract large-scale generation certificates for the period 2001-17.

3.4.2.9.2. Register of accredited power stations

Available from:

https://www.rec-registry.gov.au/rec-registry/app/public/power-station-register

details baseline energy generated by renewable energy power stations above which large-scale generation certificates can be earned for the period 2001-17. QDE's, Analytics' Antony Stone accessed the data on CER's website electronically and made the data available for QEDB.

Combining the data on LGCs and generation baselines allows the estimation of electricity generated by private renewable energy power stations.

Notes: Renewable energy generation will be understated in years when generation does not exceed the baseline. Data is for calendar years which is contrary to all other data gathered by financial year.

3.4.2.9.3. National Greenhouse and energy reporting (NGER)

NGER details energy production, consumption and emissions by reporting entities for the period 2008-09 to 2016-17. The data is restricted. Access details can be found here:

http://www.cleanenergyregulator.gov.au/OSR/EERS/The-Emissions-and-Energy-Reporting-System

Specified members in the Analytics team in DEWS are provided access to the Queensland data. Data accessed includes:

- Electricity generated by power station (for public and private use) in GWh
- Electricity sent-out to grid by power station (for public and private use) in GWh
- Electricity used onsite by power station (for public and private use) in GWh
- Electricity consumed by railway customers in GWh

Note: Electricity consumed by Aurizon as reported in NGER includes energy generated from braking. For the purposes of electricity consumption, the estimation of energy from braking is NOT reported as electricity consumption for the transport sector.

3.4.2.9.4. Clean Energy Regulator: Historical postcode data for small scale installations

Rooftop solar installations are detailed by postcode for the period 2012-2017. The data is available from CER at:

http://www.cleanenergyregulator.gov.au/RET/Forms-and-resources/Postcode-data-for-small-scale-installations/historical-postcode-data-for-small-scale-installations

3.4.2.9.5. Clean Energy Regulator: Postcode zone ratings and postcode zones for solar panel systems

Energy generation potential (effectively capacity factors) for rooftop solar installations are estimated by the Australian Photovoltaic Institute (APVI) and detailed by postcode. The data is available from CER at:

http://www.cleanenergyregulator.gov.au/DocumentAssets/Pages/Postcode-zone-ratings-and-postcode-zones-for-solar-panel-systems.aspx

Combining the data on postcode installations and postcode zone ratings allows the estimation of electricity generated by private rooftop solar systems.

3.4.2.10. Australian Photovoltaic Institute (APVI): Mapping Australian Photovoltaic installations

APVI's methodology for estimating PV generation potential is detailed under the heading "*Mapping Australian Photovoltaic installations*" and can be found at:

http://pv-map.apvi.org.au/live

3.4.2.11. Clean Energy Council (CEC): Clean Energy Australia reports

CEC reports provide detail on annual capacity of solar PV for 2001-12.

3.4.2.12. Australian Energy Regulator (D-RIN): Distributor Economic Benchmark Regulatory Information Notices

Distributor RINs detail operational information for 2006-17 including:

- Revenue from residential, non-residential non-demand tariff, low-voltage tariff and high-voltage tariff customers in $ (2006-17)
- Energy delivered to residential, non-residential non-demand tariff, low-voltage tariff and high-voltage tariff customers in GWh (2006-17)
- Numbers of residential, non-residential non-demand tariff, low-voltage tariff and high-voltage tariff customers (2006-17)
- Energy received onto the grid from embedded residential and non-residential customers in GWh (2006-17)
- Energy delivered on controlled load to residential customers (2006-17)
- Network line length in circuit kilometres (2006-17)

Note: EnergyQueensland provided estimations for all these line items for the period 2002-05 and estimations for the line items for Energex only for 1996-2001.

The revenue, energy delivered and customer numbers form part of the estimation of prices and consumption for different customer classes. Details of energy received onto the grid provides an estimate of energy sent onto the grid by rooftop solar customers, therefore enabling an estimate of private consumption of solar electricity generation.

3.4.2.13. Australian Energy Regulator (T-RIN): Transmission Economic Benchmark Regulatory Information Notices

Transmission RINs detail operational information for 2006-17 including:

- Total revenue from transmission of electricity in $ (2006-17)
- Revenue from transmission of electricity to directly connected end-users in $ (2006-17)
- Total energy delivered in GWh (2006-17)
- Energy delivered to directly connected end-users in GWh (2006-17)
- Network line length in circuit kilometres (2006-17)

Note: Powerlink provided estimations for these line items for the period 1997-2005. The revenue and energy delivered form part of the estimation of prices and consumption for industry customers.

3.4.2.14. Other sources of data for estimating prices

3.4.2.14.1. Queensland Competition Authority (QCA): Regulated price determinations

QCA regulated price determinations detail regulated prices for Queensland from 2008-16. The regulated price determinations and associated data are available from:

http://www.qca.org.au/Electricity/Regional-consumers/Reg-Electricity-Prices/Archive/Final-report

Note: Prior to 2007, prices were set by the Minister for Mines and Energy.

3.4.2.14.2. Queensland Government Gazette (QGG) notices of electricity prices

Notices on electricity tariffs have been detailed in the QGGs. Notices for the period 1970-2007 were collected to provide a history of tariffs in Queensland. In 2016-17, prices in South East Queensland were deregulated and as a result no notices on tariffs in the South East are included in QGG after this date. Prices for non-market customers in regional Queensland are however still determined by the QCA due to a lack of competition on retail prices to rural customers. The Queensland government is committed to uniform tariffs for electricity, which means the QCA determinations seek to equalise prices in regional Queensland with those in South East Queensland. Tariffs estimated by the QCA include headroom allowances, customer acquisition costs and cost of energy allowances so prices to market customers may be lower than QCA determined tariffs, but the extent of discounts offered to market customers is not available and thus cannot be included in average price estimates. For these reasons, QCA determinations are used as benchmarks for Queensland electricity prices

3.4.2.14.3. Energy Action Price Index

The private firm Energy Action calculates an index of average wholesale prices for commercial and industrial customers based on bids received from retailers into Energy Action's Australian Energy Exchange. The price index can be seen here:

http://www.energyaction.com.au/energy-procurement/aex-reverse-auction/energy-action-price-index

and some features of the methodology are detailed here:

http://eawebsite.blob.core.windows.net/eawebsite/default-document-library/frequently-asked-questions-(faqs).pdf?sfvrsn=4

3.4.2.14.4. Australian Competition and Consumer Commission: Retail Electricity Pricing Inquiry

The ACCC has conducted an inquiry into retail electricity prices. The preliminary report, published in November 2017, which details residential prices for 2016-17 and commercial prices (small to medium enterprises) for 2015-16, can be found here:

https://www.accc.gov.au/publications/accc-retail-electricity-pricing-inquiry-preliminary-report

The final report, published in June 2018,which details residential and commercial and industry prices for 2017-18 can be found here:

https://www.accc.gov.au/regulated-infrastructure/energy/electricity-supply-prices-inquiry/final-report

3.4.2.15. Australian Bureau of Statistics (ABS): Series 6291.0.55.003 - EQ06

Series 6291.0.55.003 – Table 06 - Employed persons by industry group, details employment by state by industry group. Of particular interest for electricity supply, is employment for ANZSIC codes 260-264. This detail is available from:

http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6291.0.55.003Aug%202017?OpenDocument

Details and frequency of data available include:

- Employment in electricity supply, quarterly (1985-2017)

Employment data is sourced from the May quarter for each year, where available. If not available for the May quarter, then data is sourced from the nearest available quarter for that year.

Note: Electricity supply employment numbers are very volatile, and should be treated with some caution.

3.4.2.16. Queensland Rail Annual Reports (QR)

QR Annual Reports provide fuel costs for 1996-01 in Table entitled "QR Costs as infrastructure provider: Electric energy and demand"

QR Annual Reports provide fuel costs for 2014-17 in Notes to financial statements "Traction Electricity and train fuel".

QR Annual Reports 2007-17 can be found here:

https://www.queenslandrail.com.au/aboutus/governance/annualreports

QR Annual Reports 1995-06 can be found here:

https://www.parliament.qld.gov.au/work-of-assembly/tabled-papers/online-tabled-papers

3.5. Biomass and biofuels data

3.5.1. Structure of QEDB biofuels data

Data Series Name (DSN)	Data Series Description	Unit
Biomass and biofuels production		
RBPRPU	Production of biomass in physical units	Tonnes
RBPRGJ	Production of biomass in energy units	Gigajoules
RBPRKG	Factor to convert biomass from physical units to energy units	Gigajoules / tonne
RFPRPU	Production of biofuels in physical units	Million litres
RFPRGJ	Production of biofuels in energy units	Gigajoules
RFPRKG	Factor to convert biofuels from physical units to energy units	Gigajoules / Litre
Biomass and biofuels consumption		
RBCCPU	Consumption of biomass by the commercial sector in physical units	Tonnes
RBCPPU	Consumption of biomass by the electric power sector in physical units	Tonnes
RBCIPU	Consumption of biomass by the industry sector in physical units	Tonnes
RBCRPU	Consumption of biomass by the residential sector in physical units	Tonnes
RBCTPU	Consumption of biomass by the transport sector in physical units	Tonnes
RBCSPU	Consumption of biomass by all sectors in physical units	Tonnes
RBCCGJ	Consumption of biomass by the commercial sector in energy units	Gigajoules
RBCPGJ	Consumption of biomass by the electric power sector in energy units	Gigajoules
RBCIGJ	Consumption of biomass by the industry sector in energy units	Gigajoules

Data Series Name (DSN)	Data Series Description	Unit
RBCRGJ	Consumption of biomass by the residential sector in energy units	Gigajoules
RBCTGJ	Consumption of biomass by the transport sector in energy units	Gigajoules
RBCSGJ	Consumption of biomass by all sectors in energy units	Gigajoules
RBCSDV	Value of biomass consumption (nominal)	$ millions
RBCSDG	Price of biomass in energy units (nominal)	$ / gigajoule
RBCSRV	Value of biomass consumption (real)	$2017 millions
RBCSRG	Price of biomass in energy units (real)	$2017 / gigajoule
RFCCPU	Consumption of biofuels by the commercial sector in physical units	Million litres
RFCPPU	Consumption of biofuels by the electric power sector in physical units	Million litres
RFCIPU	Consumption of biofuels by the industry sector in physical units	Million litres
RFCRPU	Consumption of biofuels by the residential sector in physical units	Million litres
RFCTPU	Consumption of biofuels by the transport sector in physical units	Million litres
RFCSPU	Consumption of biofuels by all sectors in physical units	Million litres
RFCCGJ	Consumption of biofuels by the commercial sector in energy units	Gigajoules
RFCPGJ	Consumption of biofuels by the electric power sector in energy units	Gigajoules
RFCIGJ	Consumption of biofuels by the industry sector in energy units	Gigajoules
RFCRGJ	Consumption of biofuels by the residential sector in energy units	Gigajoules
RFCTGJ	Consumption of biofuels by the transport sector in energy units	Gigajoules
RFCSGJ	Consumption of biofuels by all sectors in energy units	Gigajoules
RFCSDV	Value of biofuels consumption (nominal)	$ millions
RFCSDG	Price of biofuels in energy units (nominal)	$ / gigajoule
RFCSRV	Value of biofuels consumption (real)	$2017 millions

Data Series Name (DSN)	Data Series Description	Unit
RFCSRG	Price of biofuels in energy units (real)	$2017 / gigajoule

3.5.2. Primary sources of data for biomass and biofuels module

3.5.2.1. Australian Energy Statistics (AES)

Australian Energy Statistics provides data on production and consumption of energy by state from 1974 to 2017. AES can be found at:

https://www.energy.gov.au/government-priorities/energy-data/australian-energy-statistics

AES does not provide data on reserves, exports, prices, employment or emission data.

3.5.2.2. Australian Sugar Milling Council (ASMC)

ASMC publishes bagasse production statistics, found here:

https://asmc.com.au/industry-overview/statistics/

and the Australian Sugar Year Books, found at the Queensland State Library, publish historical bagasse data.

ASMC data shows differences to AES data but if the data is compared over the period 1970-2017, there is only a 5% difference over that period. Thus, AES data is assumed to be reliable.

Bagasse and wood waste are generally assumed to have no value.

Note: No sources of data on biofuel production, consumption and value were found within QDNRME. In the absence of data, AES data is used for production and consumption and RACQ's Fuel Price Report is used to estimate the value of ethanol.

3.6. Economy data

3.6.1. Structure of QEDB economy data

Data Series Name (DSN)	Data Series Description	Unit
QEGPDV	Gross State Product (nominal)	$ millions
QEGPRV	Gross State Product (real)	$2017 millions
QEINPU	Cost Price Index (Brisbane)	Index
QEICPU	Cost Price Index – Electricity (Brisbane)	Index
QEIPPU	Producer Price Index (Australia)	Index
QEIEPU	Producer Price Index - electricity (Australia)	Index
QEIGPU	Producer Price Index – gas (Australia)	Index
QEPNPU	Population	Number

Data Series Name (DSN)	Data Series Description	Unit
QELFPU	Labour Force	Number
QEJBPU	Employment	Number
AUUSDP	US dollar purchased with one Australian dollar	US$ / AU$
PODADG	Crude Oil Spot Price: Dubai Arab Historical Series (nominal)	$ / gigajoule
PODARG	Crude Oil Spot Price: Dubai Arab Historical Series (real)	$2017 / gigajoule

3.6.2. Primary sources of data for economy module

3.6.2.1. Queensland Past and Present - A hundred years of statistics, 1896-1996 (QPP)

QPP provides statistical information for climate and environment, demography, politics and government, economics, transport, education, health, social welfare, law and order. The economics section details labour force, employment, industrial relations, wages, expenditure, external trade, primary production, manufacturing and construction. It deals only briefly with economic accounts stating that, due to a lack of resources, Gross State Product (GSP) was not estimated after 1938. In 1988 the Australian Bureau of Statistics began State estimates for Queensland starting with 1986-87 with backdated estimates to 1977-78. QPP can be found here:

http://www.qgso.qld.gov.au/products/reports/qld-past-present/index.php

For QEDB, QPP is used to source the following data:

- Labour force (1970 – 1996)
- Employment (1970 – 1996)

3.6.2.2. Queensland Historical Demography Tables 1823-2008 (QHT-D)

QHT-D provide historical data on population including the years 1970-2008. QHT-D is available from: http://www.qgso.qld.gov.au/subjects/demography/population-estimates/tables/historical-tables-demography/index.php

Details and frequency of data available include:

- Queensland population (1970-2008)

3.6.2.3. Queensland Population Growth Highlights and Trends

Queensland population estimates are available online from:

http://www.qgso.qld.gov.au/subjects/demography/demography-general/reports/pop-growth-highlights-trends-qld/index.php

Details and frequency of data available include:

- Queensland population (2006-17)

3.6.2.4. Queensland Labour force status by region

Queensland labour force estimates are available online from:

http://www.qgso.qld.gov.au/products/tables/labour-force-status-region-qld/labour-force-status-region-qld.csv

Details and frequency of data available include:

- Queensland labour force (2006-17)

3.6.2.5. Queensland Employed persons by industry

Queensland employment estimates are available online from:

http://www.qgso.qld.gov.au/subjects/economy/labour/tables/employed-persons-industry-qld/index.php

Details and frequency of data available include:

- Queensland employment (1986-2017)

3.6.2.6. Consumer Price Index, All Groups, Brisbane (CPI)

Queensland CPI estimates are available online from:

http://www.qgso.qld.gov.au/products/tables/cpi-all-groups-annual-bris-aus/cpi-all-groups-annual-bris-aus.csv

Details and frequency of data available include:

- Queensland CPI (1970-2017)

Queensland CPI-Electricity (CPI-E) estimates for 1981-2017 are available online from:

http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6401.0Mar%202018?OpenDocument

3.6.2.7. Australian Bureau of Statistics: Producer Price Indexes, Australia: Table 13, Input to manufacturing industries (PPI)

PPI estimates are available online from:

http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/6427.0Mar%202018?OpenDocument

Details and frequency of data available include:

- PPI for manufacturing (1970-2017)
- PPI: electricity for manufacturing (1970-2017)
- PPI: gas for manufacturing (1970-2017)

3.6.2.8. Gross state product at factor cost by industry and main components, Queensland (GSP)

GSP estimates are available online from:

http://www.qgso.qld.gov.au/products/tables/gsp-factor-cost-industry-components/gsp-factor-cost-industry-components.csv

Details and frequency of data available include:

- GSP (1986-2017)

3.6.2.9. 5220.0 Australian National Accounts: State Accounts, Historical Series of Gross State Product

The Australian Bureau of Statistics National Accounts' Hirut Berhe, provided a spreadsheet for the period 1978-2017, detailing the reported state GSP's using different System of National Accounts (SNA) definitions from 1978-2017.

Details and frequency of data available include:

- GSP SNA68 (1978-93)
- GSP SNA93 (1990-06)
- GSP SNA08 (1990-17)

3.6.2.10. Regional Economic Development in Queensland 1859 to 1981 with Particular Emphasis on North Queensland, by C.P. Harris

Harris details GSP estimates for Queensland for 1970-81 on page 117, Table 7.4. The book is available from University of Queensland library, call number HC607.Q4 H36 1984.

3.6.2.11. Queensland Year Book (QYB)

QYB provided data on all activities within Queensland for the period 1901-2001, although publication was not always annual. The reports are available from the Australian Bureau of Statistics at:

http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/1301.3Main+Features11901?OpenDocument

Details and frequency of data available include:

- Queensland Year Book, 1991: Gross State Product (1982-87)
- Queensland Year Book, 1989: Gross State Product (1978-86)

3.6.2.12. Australian dollar, US dollar exchange rate

Reserve Bank of Australia provides data on US$-AU$ exchange rate. The data is available from the RBA at:

https://www.rba.gov.au/statistics/historical-data.html

Table F11 major currencies exchange rates by month are averaged to estimate average annual exchange rate.

3.6.2.13. International Energy Agency: Crude oil spot price- Dubai Arab Historical Series

IEA's Energy Prices and Taxes Statistics provides data on Crude Oil spot prices. The data is available from the IEA at:

https://stats.oecd.org/OECDStat_Metadata/ShowMetadata.ashx?Dataset=SPOT_CR&ShowOnWeb=true&Lang=en

According to RACQ, Tapis Crude is the most appropriate benchmark oil price for Brisbane prices. Tapis Crude prices are only reported by the IEA from 2011. The IEA does provide the Dubai Arab Historical series for the required period from 1970-2017, so this is used as a benchmark crude oil price in preference to Tapis Crude.

4. Conclusion

QEDB details 570 data series for most of the years 1970-2017. There is no evidence of a similar database with detailed volumes and prices for all energy sources for this period in Australia which has made it a challenging exercise. In general where data is missing estimations have been based on existing proxies or simple extrapolation to fill gaps in years. This simple process was followed in preference to more complex statistical estimations because there are frequently insufficient data points for modelling, energy prices are volatile and the purpose of the exercise was to understand the volatility.

Having constructed the database bottom up from known data on a line by line, year by year basis, there is potential for errors. Volume data has been spot checked to existing data sources but it is likely that errors in price and value estimations will come to the fore as the data is analysed and used in earnest.

QEDB is provided here as a "beta" version for early users to assess assumptions and estimation methods. Feedback and additional sources of data will be welcomed.

Appendix A: Glossary of terms

Term	Description
ABS	Australian Bureau of Statistics
AEC	Australian Energy Council (formerly ESAA)
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AES	Australian Energy Statistics / Australian Energy Update
AGEIS	Australian Greenhouse Emissions Information System
ANZSIC	Australian and New Zealand Standard Industrial Classification
APVI	Australian PV Institute
CAPELEC	Capricornia Electricity Corporation
CER	Clean Energy Regulator
CPI	Consumer Price Index
DSN	Data Series Name
EIA	Energy Information Agency (United States)
ESAA	Energy Supply Association of Australia (formerly Electricity Supply Association of Australia)
FNQEC	Far North Queensland Electricity Corporation
FTE	Full time equivalent
Garget	Bureau of Infrastructure, Transport and Regional Economics, Petrol and Diesel Prices in Australia, BITRE, Canberra
GJ	Gigajoules
GOC	Government Owned Corporation
GPT	Gas Price Trends Review (Oakley Greenwood)
Green Book	QUEENSLAND COALS: Physical and Chemical Properties, Colliery and Company Information; 14th Edition 2003, Compiled by Andrew J. Mutton
GSP	Gross State Product
GSQ	Queensland GeoScience
IEA	International Energy Agency
LGC	Large-scale Generation Certificates
LNG	Liquid Natural Gas
LPG	Liquid Petroleum Gas
MEC	Mackay Electricity Corporation
MELD	Mines and Explosive Levy Database of employees and contractors for OHS levy calculation
MERLIN	Mineral and Energy Resources Location and Information Network
NEM	National Electricity Market
NEMMCO	National Electricity Market Management Company (later AEMO)
NGER	National Greenhouse and Energy Reporting
NQEC	North Queensland Electricity Corporation
OHS	Occupational Health and Safety
PCI	Pulverised Coal Injection (Coal)
PPI	Producer Price Index
QCB	Queensland Coal Board
QCA	Queensland Competition Authority
QCD	Queensland Coal Production and Sales Database from monthly and quarterly coal returns

Term	Description
QDE	Queensland Department of Energy (for historic simplicity as Energy often included with Mines, Natural Resources and Water)
QDM	Queensland Department of Mines (for historic simplicity as Mines often combined with Minerals, Natural Resources, Energy)
QDNRM	Queensland Department of Natural Resources and Mines
QDTMR	Queensland Department of Transport and Main Roads
QEC	Queensland Electricity Commission
QEDB	Queensland Energy DataBase
QEGB	Queensland Electricity Generating Board
QGC	Queensland Generation Corporation
QGE	Queensland Gas Engineer and Chief Gas Examiner
QGSO	Queensland Government Statisticians Office
QHT-E	Queensland Historical Tables – Economy
QOSR	Queensland Office of State Revenue
QPP	Queensland Past and Present – A hundred years of statistics, 1896-1996
QR	Queensland Rail
QT	Queensland Treasury
QTSC	Queensland Transmission and Supply Corporation
QYB	Queensland Year Book
RIN	Regulatory Information Notice
SECQ	State Electricity Commission of Queensland
SEDS	State Energy Data System (United States)
SEQEC	South East Queensland Electricity Corporation
SWQEC	South West Queensland Electricity Corporation
tCO_2^e	Tonnes of Carbon Dioxide equivalent
TSQP	Trade Statistics for Queensland Ports
WBBEC	Wide Bay Burnett Electricity Corporation

Appendix B: Queensland energy timeline

Year	Context	Detail
1866	Gas	Gasworks, creating gas from coal, operating in Brisbane
1867	Transport	Four sections of line between Ipswich and Toowoomba completed
1875	Transport	First train runs between Ipswich and Brisbane
1882	Transport	Townsville to Charters Towers opens
1888	Electricity	Barton, White & Co supplied electricity to the General Post Office and nearby shops in Queen Street, Brisbane
1891	Transport	Railway from Brisbane to Gympie opens
1893	Transport	Queensland flood destroys Victoria Bridge and Indooroopilly Railway Bridge
1896	Electricity	Barton, White & Co becomes Brisbane Electric Supply Co
	Electricity	Enactment of The Electric Light and Power Act, instituting a system of franchises for the provision of electricity
	Electricity	Franchises sold to sawmills, sugar mills, dairy processing factories to generate electricity for their private use with excess sold to neighbouring towns or districts
1897	Electricity	Countess Street power station opened by Brisbane Tramways for electric trams
1900	Gas	Natural gas discovered at Hospital Hill Roma whilst drilling for water
1902	General	Brisbane proclaimed a city
1904	Electricity	Brisbane Electric Supply Co becomes City Electric Light Co
1906	Gas	Natural gas supply reticulated in Roma. Supply dried up 2 weeks later.
1912	Electricity	Supply of electricity in provincial towns commences
1914	Transport	Gladstone Harbour Board established
1915	Electricity	Toowoomba, Warwick, Ay, Bundaberg and Childers have electricity
1921	Transport	North-South line to Mackay opens
1924	Transport	Cairns to Brisbane establishes Australia's longest unbroken railway
1930	Transport	South Brisbane to Kyogle (NSW) opens
1930s (mid)	Electricity	Brisbane, Toowoomba, Ipswich and Cairns supply electricity beyond the city limits
1937	Electricity	Electricity undertakings by 21 private companies and 47 public authorities
	Electricity	Inadequate supply encouraged regional development program
1938	Electricity	State Electricity Commission established to administer electricity supply legislation, general control, organisation and development of electricity supply
	Electricity	
Post 1945	Electricity	Franchises granted over large regions, with greater levels of centralisation and networking to gain lower production costs
1948	Oil	Government assumes control of petroleum product prices under the Profiteering Prevention Acts,, administered by the Commissioner of Prices
1949	Coal	Queensland Coal Board established to secure and maintain ,adequate supplies of coal throughout Queensland and for export, and to' provide for the regulation and improvement of the coal industry.
1952	Electricity	City Electric Light Co becomes Southern Electric Authority of Queensland
	Electricity	88% of population supplied with public electricity
1959	Coal	Coking coal first mined at Kianga mine
1959	Oil	First commercial oil discovery at Moonie
1959	Coal	Open cut coal mining at Moura commences

1962	Gas	16 establishmentsused coal to produce 79.5mm3 gas for 137,892 consumers
1964	Oil	Moonie Oil Pipeline opened to transmit oil 190 miles from Moonie to Brisbane
1965	Oil	Bulwer Island oil refinery built by Amoco
	Gas	Government appointed gas referee fixes the price of gas payable by consumers.
	Electricity	State Electricity Commission controls tariffs to ensure that they are fair and reasonable, subject to approval by the Minister
1967	Electricity	Alumina plant opened at Gladstone
	Oil	Petrol removed from price control
1968	General	National party returned to power under Johannes Bjelke-Petersen
1969	Gas	Roma Brisbane Gas Pipeline commissioned to transmit gas 454km from Surat Basin to Brisbane
1970	General	The Metric Conversion Act was passed and received Royal Assent. The Metric Conversion Board was established and Australia commenced the change to metric units.
	Coal	Queensland Rail ceases to use coal
	Gas	Reticulated natural gas available in Ipswich, Toowoomba and South Brisbane.
	Electricity	98% of population supplied with public electricity
	Oil	From 18 Sep 1970 Australian crude oil price dropped to import parity price established by the Commonwealth Government at 10 Oct 1968, the exploration incentive being removed. In Queensland, this reduced the price paid for Moonie crude by approximately A$1.00 to A$2.15 per barrel.
1971	Gas	Reticulated gas available in Brisbane, Ipswich, Toowoomba, Gympie, Maryborough, Bundaberg, Rockhampton, Mackay and Cairns
	Gas	Bulk sales of LPG for other than reticulation purposes were made in most parts of the State.
	Gas	Gas works in Gympie and Rockhampton used coal for producing town gas. By 1971 coal used in gas works declined from 135,467 tons in 1967 to 6,905 tons.
	Coal	Hay Point coal terminal opens
1973	General	Queensland government reports coal, gas, oil and electricity using metric system
	Electricity	Interconnection (275 kV) between central and southern Queensland networks
	Electricity	Central network comprised Capricornia Regional Electricity Board
	Electricity	Southern network comprised the Southern Electric Authority, Brisbane City Council, Wide Bay Burnett Regional Electricity Board and Dalby Town Council.
	Oil	Organisation of Petroleum Exporting Countries embargo oil exports to nations supporting Israel in October. Global oil prices rise sharply.
1974	Oil	Organisation of Petroleum Exporting Countries stop embargo of oil exports. Global oil prices remain at elevated levels.
1976	Electricity	Second 275kV interconnect between central and southern Queensland networks
1977	Electricity	Electricity supply industry reorganised. Six regulatory Acts repealed and replaced by the Electricity Act, 1976.

	Electricity	State Electricity Commission of Queensland to plan, develop and coordinate electricity throughout the State.
	Electricity	Generation carried out by the Queensland Electricity Generating Board and supplied energy in bulk to 7 distributing boards.
	Electricity	Electricity Boards take over responsibility from Local Authorities west of larger regional authorities for electricity
	Electricity	Interconnection (275 kV) between central and northern Queensland networks (October)
1978	Transport	Cross river rail link (South Brisbane to Roma Street) opens (November)
	Oil	Fixed Import Parity Price (IPP) implemented (IPP was calculated on the basis of the replacement of Australian crude oils with imported crudes)
1979	Transport	Suburban rail electrification commences in Brisbane with Darra-Ferny Grove
	Gas	Reticulated natural gas available in Dalby.
	Transport	Suburban rail electrification for Darra-Ipswich service
	Oil	Iranian Revolution reduces oil production in Iran, causing global oil prices to rise sharply.
1980	Gas	Reticulated natural gas available in Oakey.
	Oil	Iran-Iraq war further reduces oil production in Iran and Iraq, causing global oil prices to rise again.
1981	Oil	Jackson oil field in Cooper Basin discovered
	Global	United States economy in recession
1982	Transport	Suburban rail electrification for Roma Street-Kingston and Mayne-Shorncliffe services
	Gas	Reticulated natural gas available to industrial consumers on the north side of Brisbane with a tie-in to the transmission line across the Brisbane River at Gibson Island
	Electricity	Boyne Island aluminium smelter completed.
	General	Department of Mines shifts to financial year reporting from calendar year reporting
	Global	United States economy in recession
1983	Energy	Energy consumption decline due to economic recession, drought and structural change to improve efficiency
	Transport	Suburban rail electrification for Northgate-Petrie and Park Road-Thorneside services. Brisbane suburban system fully electrified.
1984	Gas	Reticulated natural gas available to residential consumers on the north side of Brisbane
	Transport	Suburban rail electrification for Kingston-Beenleigh services. Brisbane suburban system fully electrified.
	Transport	Abbot Point Coal Terminal opens
	Coal	Dalrymple Bay coal loading facility opened
	Oil	Bulwer Island oil refinery bought by BP
	Oil	Jackson-Moonie pipeline opened connecting Jackson oil production with Brisbane port and refining
1985	Electricity	Queensland Electricity Generating Board and State Electricity Commission of Queensland amalgamated. Now called Queensland Electricity Commission
	Gas	Reticulated natural gas available in Roma
	Gas	LPG from natural gas plants at Wungoona and Kincora, both close to Roma. Capacity of 45,000 tonnes/annum.

	General	Wivenhoe dam opens
1986	Transport	First section of Main Line Electrification opened on 6 September
1987	General	No Queensland Year Book produced
	General	Fitzgerald hearings into corruption start
	General	M.J Ahern assumes premiership from Sir Joh Bjelke-Petersen
	Oil	Santos assumes responsibility for oil production, development and downstream operations from Vamgas in Queensland
	Global	On what came to be known as Black Monday in October 1987, global stock markets crashed
1988	Gas	Queensland State Gas Pipeline commissioned to transmit coal seam gas from the Denison Trough in the Bowen Basin to Gladstone
	Oil	Deregulated crude oil marketing effective 1 January 1988. Refiners no longer obligated to buy Australian crude oil under the allocation system which had been in operation since 1965; no longer fixed Import Parity Price (IPP) in operation since 1978 (the IPP was calculated on the basis of the replacement of of Australian crude oils with imported crudes); producers gained freedom to export crude oil
	General	Queensland Year Book 1988, reformatted. No industry details on electricity and gas. New energy chapter.
	Transport	Electrification of Eagle Farm completes Brisbane Suburban Network in February
	Transport	Central Queensland rail lines electrified
	General	World Expo
	Electricity	Barcaldine-Longreach, Roma, Charleville, Cunnamulla and Quilpie connected to the grid
	Transport	Railway electrification to Emerald completed
1989	General	Fitzgerald Inquiry results published
	General	Russell Cooper assumes premiership from M.J. Ahern
	General	Australian Labor Party returns to power under Wayne Goss
1990	Gas	30 CSG wells drilled in Bowen Basin
	Gas	Commercial natural gas productions from the Denison Trough commences
	Gas	Wallumbilla-Gladstone 530km pipeline opens to transmit CSG from Surat Basin and Denison Trough to Gladstone and Rockhampton
	Economy	Australian economy goes into recession in September quarter
1991	Gas	Historic agreement struck to sell gas across state borders from south west Queensland to South Australian customers
	Economy	Australian economy returns to growth in September quarter
1994	Gas	Supply of gas from south west Queensland to South Australia commences
1995	Gas	160 CSG wells drilled in Bowen Basin
	Gas	Santos signs contracts with Incitec Pivot, Allgas Energy and Gas Corporation of Queensland to supply gas from south west Queensland
	Electricity	Electricity industry restructured and corporatised on 1 January 1995. Supply to customers coordinated by Queensland Transmission and Supply Corporation (QTSC).
	Electricity	QTSC responsible for planning for future electricity demand
	Electricity	Queensland Generation Company builds, owns and operates government owned generating installations
	Electricity	Seven Government-owned distribution businesses and three retail businesses created. SEQEC, the largest of the distribution corporations,

		and its wholly owned retail arm called Southern Electricity Retail Corporation (SERC), changed its name to Energex. Northern Electricity Retail Corporation (NERC) became the wholly owned retail arm of FNQEC, NQEC and MEC. Central Electricity Retail Corporation (CERC) became the wholly owned retail arm of CAPELEC, WBBEC and SWQEC).
1996	General	Coalition of Liberal/Nationals assumes power under Bob Borbidge
	Gas	CSG commercial production
	Gas	Ballera to Wallumbilla pipeline completed, connects Queensland to NSW and SA markets.
	Gas	National gas market established to encourage competition and enable free trade
	Electricity	QGC named AUSTA
	Electricity	Invicta Sugar Mill cogen power station connected to the grid in June
1997	Gas	South West Queensland Gas Pipeline commissioned to supply gas from Cooper-Eromanga at Moomba to Ballera, near Roma.
	Gas	Bitumen and Oil Refineries Ltd (Boral) demerges gas distribution networks in South Australia, Brisbane (North), Ipswich, Rockhampton and Gladstone to be acquired by new ASX listed company Envestra.
	Electricity	Austa Electric acquires 80% of Mica Creek from Mt Isa Mines
	Global	Asian Financial Crisis starts with Thai government requesting assistance from the IMF after Thai Baht loses considerable value following floating of the currency.
1998	General	Australian Labor Party regains power under Peter Beattie
	Gas	Carpentaria Pipeline commissioned to supply gas to Mt Isa from Ballera
	Gas	Energex acquires Allgas for $250million
	Electricity	NEM commences operation, Queensland participates from December 1998 although no interconnection with NSW
	Electricity	Retail contestability commences on 29 March 1998. 43 customers who consumed more than 40GWh pa choose their own retailer.
	Electricity	16 retailers registered in Queensland
	Electricity	400 customers who consumed more than 4GWh pa eligible to choose their own retailer from 1 October 1998.
	Electricity	Queensland Transitional Power Trading Corporation manages Power Purchase Agreements (including Gladstone Power Station)
	Electricity	CERC merged with NERC, renaming itself as Ergon Retail, with the intention of becoming the regional Queensland electricity retailer
	Electricity	CS Energy, Tarong Energy and Stanwell corporate entities are formed from Austa Electric
1999	Electricity	Six regional distribution corporations merged to form Ergon Energy
	Electricity	AUSTA winding up commences and is completed on 2 July 2000
	Electricity	Roma GT connected to Ballera-Wallumbilla pipeline
	Electricity	Mica Creek conversion to natural gas completed in May 1999
2000	General	GST introduced on 1 July 2000
	Gas	Boral Energy demerged from Boral building and construction business and renamed Origin Energy
	Electricity	Queensland Competition Authority (QCA) becomes jurisdictional regulator on electricity prices on 19 December 2000.
	Electricity	Terranora Interconnector (Directlink) (direct current) commissioned. Consists of 2x110kV lines from Mudgeeraba in Queensland to Terranora in NSW.

	Electricity	Directlink capacity QLD-NSW is 210MW and NSW-QLD is 107MW
	Electricity	Queensland government announces Queensland Energy Policy – A Cleaner Energy Strategy which seeks diversification of energy mix to greater use of gas and renewables.
2001	Electricity	Queensland New South Wales Interconnector (QNI) (alternating current) commissioned. Consists of 2x 330kV lines between Dumaresq in New South Wales and Bulli Creek in Queensland.
	Electricity	QLD-NSW capacity is 1078MW, NSW-QLD capacity is 300-600MW
2002	Gas	First CSG deliveries to CS Energy
2004	Gas	North Queensland Pipeline commissioned to supply CSG from Moranbah to Townsville
	Electricity	5 days of storms in January in the Energex area, led to 120,000 customers without power on the 5th day. Between 17 and 23 February, Brisbane experienced sustained hot water culminating with a maximum of 41 ^{O}C on 22 February. Energex averted significant outages during this period but the system was very heavily loaded and was operated very near, or at, its maximum capacity in many areas. The Somerville Report released in July 2004, recommended that the Queensland Government set minimum reliability standards for distribution corporations to avert outages.
2005	Gas	Queensland government legislates that electricity retailers source 13% of electricity from gas, increasing to 15% by 2011
2006	General	Cyclone Larry hits northern Queensland
	Electricity	Queensland government sells Sun Retail (Energex Retail (electricity)) to Origin Energy
	Gas	Queensland government sells Sun Gas (Energex Retail (gas)) to AGL
	Gas	Energex sells Allgas Distribution Network to Australian Pipeline Trust
2007	Electricity	Tarong Power Station cuts back generation from April 2007 due to chronic shortage of water in Boondoomba Dam
	Electricity	Queensland government sells Powerdirect (Ergon Retail) to AGL
2008	Electricity	Rains in early 2008 which fill Boondoomba Dam allow Tarong Power Station to return all units to generation
	Electricity	Western Corridor Recycled Water Scheme is delivered which provides water security for Tarong Power Station
2009	General	Australian Labor Party is returned to power under Anna Bligh
2011	General	75% of the state declared a disaster zone after widespread flooding. Cyclone Yasi leaves many homeless
2012	General	Liberal National Party assumes power under Campbell Newman
	Emissions	Clean Energy Act takes effect on 1 July 2012. Carbon price of $23/tCO2 charged on carbon emissions
2014	Emissions	Clean Energy Act repealed on 1 July 2014.
	Gas	Envestra acquired by Cheung Kong Consortium and renamed to be Australian Gas Networks.
2015	General	Australian Labor Party returns to power under Anastasia Palaszczuk
	Oil	Bulwer Island oil refinery ceased production due to increased refinery capacity in Asia-Pacific
	Gas	Exports of LNG start from Curtis Island
2016	Electricity	Prices in South East Queensland deregulated. Prices in regional Queensland remain regulated by the Queensland Competition Authority.

2017	Electricity	Queensland Government directs Stanwell to alter its bidding behaviour to reduce volatility in the Queensland region of the NEM (in June).
	Electricity	Queensland Government directs Energex and Ergon Energy to remove the cost of the Solar Bonus Scheme from electricity bills over 3 years from 1 July 2017 (Approximate cost to Government of $770 million)