

Gross Regional Product - Methodology

Gross Regional Product (GRP) is a measure of the total value of goods and services produced in a region during a given period. It is the regional equivalent of Gross Domestic Product (GDP) at the national level or Gross State Product (GSP) at the state level.

Queensland Treasury's estimates of GRP are produced using an income-side approach, which aggregates the income generated by employees, governments and firms, to derive an appropriate measure of total income generated by the factors of economic activity in each industry/region.

The Australian Bureau of Statistics (ABS) produces annual estimates of Queensland's GSP in the [ABS National Accounts: State Accounts](#). These estimates include measures of compensation of employees (COE) and gross operating surplus & gross mixed income (GOSMI) by industry at the state level.

To develop GRP, state COE and GOSMI by industry are allocated across Queensland's regions based on analysis of relevant data and indicators as outlined below.

Total factor income (the sum of COE and GOSMI) by region is used to allocate Gross Value Added (GVA) by region. The sum of GVA across all industries plus taxes less subsidies on products (from ABS *Australian National Accounts: State Accounts*) in a particular region equals GRP.

Estimates of GVA for each *Australian and New Zealand Standard Industrial Classification* (ANZSIC) industry and ownership of dwellings are provided at the division level (i.e. the broadest ANZSIC category). For some industries, where appropriate, the compilation of GVA is done at sub-division level and then aggregated to the division level. For further information about industry classifications, refer to [ABS Australian and New Zealand Standard Industrial Classification \(ANZSIC\)](#).

Estimates of GRP are, to the extent possible, based on data representing place of work (PoW) rather than place of usual residence (UR). This gives a more accurate representation of the production within a region.

Compensation of employees

Across each industry, COE is apportioned to regions using aggregate '*Employee income – Job level*' by UR from ABS *Jobs in Australia* (JIA) and ABS *Jobs and Income of Employed Persons* (JIEP). Data are then converted from UR to PoW using ABS *Census of Population and Housing* (Census) data by income and industry.

Inter-census years are interpolated by a weighted average of the two nearest Censuses. For years after the latest available *Census* data, UR is converted to PoW using the latest available *Census* and will be revised using new *Census* data as it becomes available.

Gross operating surplus and gross mixed income

Methods for allocating GOSMI vary across industries, as outlined below. Where no other appropriate data are available to inform the allocation, aggregate '*Total employment income – Job level*' for each region from JIA/JIEP is used to allocate GOSMI across regions. Data is then converted from UR to PoW using the same method as for COE.

Industry specific GOSMI methodologies

Agriculture, forestry & fishing

GOSMI is split into *agriculture* and *forestry & fishing* by apportioning national *agricultural* and *forestry & fishing* GVA to Queensland using gross value of production data from the ABS for *agriculture* and Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) for *forestry & fishing*.

Agricultural GOSMI is allocated to regions using Queensland Department of Primary Industries (DPI) *AgTrends* data by commodity.

Forestry & fishing GOSMI is split into fisheries, aquaculture, and forestry sub-components using DPI *AgTrends* data at the state level.

- Fisheries GOSMI is allocated across regions using BDO *Economic and Social Indicators for Queensland's Commercial Fisheries reports*.
- Aquaculture GOSMI is allocated across regions using DPI *Aquaculture production summary for Queensland reports*.
- Forestry GOSMI is allocated across regions using JIA jobs data.

Mining

GOSMI is allocated across coal, metals, and oil & gas using aggregate production data from the Queensland Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (DNRMMRRD) for coal, the Australian Department of Industry, Science and Resources' (DISR) *Resources and Energy Quarterly* for metals, and the Australian Department of Climate Change, Energy, the Environment and Water's (DCCEEW) *Australian Energy Statistics* (AES) for oil & gas.

- Coal and metals GOSMI are then apportioned to regions using mine-level revenue and cost data from Wood Mackenzie.
- Oil & gas production data by lease from DNRMMRRD is used to allocate production by region. Production is benchmarked to DCCEEW AES data and then valued using the Australian Energy Market Operator's (AEMO) Brisbane Short Term Trading Market (STTM) gas price.
 - The difference between the total value of LNG exports and the value of gas production is assumed to be the value added of the LNG plants and allocated to Central Queensland.

Manufacturing

Manufacturing sub-division GOSMI is estimated using ABS *Australian Industry* data.

GOSMI is then apportioned using *Census PoW* data by manufacturing sub-division.

Electricity, gas, water & waste services

GOSMI is split between *electricity generation; electricity transmission & distribution; gas supply; water supply, sewerage & drainage services; and waste collection, treatment & disposal services* using ABS *Australian Industry* data and ABS *Input-Output* tables.

- Electricity generation GOSMI is allocated to regions based on the generation revenue data sourced from *Open Electricity*.
Input costs for coal fired generation are estimated using price data from Wood Mackenzie and production data from the DNRMMRRD. Input costs for gas fired generation are estimated using price data from the Australian Energy Regulator and gas usage data from the DCCEEW AES.
- Electricity transmission & distribution GOSMI is allocated to regions using electricity usage by industry from the DCCEEW AES, using industry by industry regional GRP allocations.
- Gas supply GOSMI is allocated using gas usage data from the DCCEEW AES by industry. Gas supply GOSMI is allocated by industry GRP allocations and by population share for residential gas usage for the regions with gas mains.
- Water supply, sewerage & drainage services and Waste collection, treatment & disposal services are allocated using a 50% share of population and 50% share of detailed employee income from ABS *JIA/JIEP*.

Construction

GOSMI is allocated to regions by breaking down construction into separate components:

Component	Allocation method
Houses	ABS <i>Building approvals</i>
Attached dwellings	ABS <i>Building approvals</i>
Renovations	ABS <i>Building approvals</i>
Non-dwelling construction	ABS <i>Building approvals</i>
Engineering: Heavy industry	Wood Mackenzie capital expenditure
Engineering: Roads, railways etc	Queensland Transport and Roads Investment Program (QTRIP)
Engineering: Electricity generation	Regional shares of GOSMI from Electricity Generation and Electricity Transmission, Distribution etc
Engineering: Other	Population share
Public construction	Queensland Budget capital program

Accommodation & food services

GOSMI is split between *Accommodation* and *Food & beverage services* at the national level using ABS *Australian Industry* data. National GOSMI for *Accommodation* is then split between the states using TRA visitor nights data.

Food & beverage services GOSMI is estimated as the residual for total Queensland *Accommodation & food services* GOSMI and the estimate for Queensland's *Accommodation* GOSMI.

Information, media & telecommunications

GOSMI is allocated to regions using population shares.

Ownership of dwellings

GOSMI is allocated to regions using the number of dwellings by type by region weighted by median rent from the Residential Tenancies Authority (RTA). Inter-census year dwelling stocks are estimated using a linear interpolation. Post-census dwelling stocks are estimated using ABS *Building Approvals*.

Net taxes on products

The ABS do not assign taxes less subsidies on products to industries at the state level. Based on ABS *Input-Output Tables* net taxes on products are predominately paid on household consumption and private gross fixed capital formation. Given this, net taxes on products are allocated to regions based on total personal income by place of usual residence from ABS *Personal Income in Australia* and population (i.e. $\text{Net taxes} = 0.5 * (\text{Income share}) + 0.5 * (\text{Population share})$).

Statistical discrepancy

The statistical discrepancy is allocated across the regions based on the enumerated GRP shares.

Tourism

Tourism is not identified as an industry in ANZSIC, as industries are defined based on the goods and services produced, while the tourism industry is defined according to the status of the consumer.

Tourism GVA is estimated using Tourism Research Australia's (TRA) regional GVA estimates and converted from TRA regions to SA4 regions using visitor nights.

Chain volume measures (CVM)

Implicit price deflators (IPDs) are used to derive chain volume measures (CVM) of GRP by industry are sourced from ABS *Australian National Accounts: State Accounts*, except for *Agriculture* and *Mining*.

Mining IPDs have been developed using production and price data from DNRMMRRD for coal, DISR *Resources and Energy Quarterly* for metals, and AEMO STTM for oil & gas.

Agriculture IPDs have been developed using a combination of data from the Queensland DPI *AgTrends*, ABS *Australian Agriculture* and ABARES.

Financial years beyond latest available JIA/JIEP data

For years beyond the latest available ABS *JIA/JIEP* data, COE by industry is allocated to each region in proportion to the latest available financial year.

GOSMI by industry for *agriculture forestry & fishing; mining; manufacturing; electricity, gas, water & waste services; construction; accommodation & food services; information, media & telecommunications*, and *ownership of dwellings* is allocated according to the methodology outlined above.

For industries where GOSMI is allocated according to *JIA/JIEP* data, the latest available *JIA/JIEP* data is used. Estimates will be updated as subsequent *JIA/JIEP* data become available.

Detailed sources

Industry	COE	GOSMI	IPD
Agriculture, forestry & fishing	ABS JIA/JIEP ABS Census	DPI <i>AgTrends</i> ABARES <i>Australian forest and wood products statistics</i> and <i>Australian Fisheries and Aquaculture Statistics</i> BDO <i>Economic and Social Indicators for Queensland's Commercial Fisheries</i> DPI <i>Aquaculture production summary</i> ABS <i>JIA</i> (forestry)	DPI <i>AgTrends</i> ABS <i>Australian Agriculture</i> ABARES <i>Crop Report</i> and <i>Agricultural Commodities</i>
Mining		Wood Mackenzie (Coal & metals) DNRMMRRD (Gas) DNRMMRRD (Coal (public and confidential data)) DISR (Metals) DCCEEW <i>Australian Energy Statistics</i> (Gas)	DNRMMRRD (Coal (public and confidential data)) DISR (Metals & oil) AEMO (Gas)
Manufacturing		ABS <i>Australian Industry</i> ABS <i>JIA/JIEP</i> ABS <i>Census</i>	ABS <i>National Accounts</i>
Electricity, gas, water & waste services		Electricity generation value: Open Electricity Other: Population share	
Construction		ABS <i>Building Approvals</i> Wood Makenzie capital expenditure QTRIP Electricity generation and distribution GOSMI calculation from Electricity, gas, water & waste services	
Wholesale trade		ABS <i>JIA/JIEP</i> ABS <i>Census</i>	
Retail trade			
Accommodation & food services		ABS <i>Australian Industry</i> TRA ABS <i>JIA/JIEP</i> ABS <i>Census</i>	
Transport, postal & warehousing		ABS <i>JIA/JIEP</i> ABS <i>Census</i>	
Information, media & telecommunications		Population	
Finance & insurance services		ABS <i>JIA/JIEP</i> ABS <i>Census</i>	
Rental, hiring & real estate services			
Professional, scientific & technical services			
Administrative & support services			
Public administration & safety			
Education & training			
Health care & social assistance			
Arts & recreation services			
Other services			
Ownership of dwellings	N/A	RTA Median Rents ABS <i>Census</i> ABS <i>Building Approvals</i>	
Tourism	TRA	TRA	
Net taxes less subsidies on products	ABS <i>Personal Income in Australia</i> ABS <i>Regional Population</i>	ABS <i>National Accounts</i>	