



Australian Government
Department of Industry, Science,
Energy and Resources

Office of the
Chief Economist

Australia: end use energy efficiency data and reporting

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Energy consumption data sources/methods



Industry and large transport, commercial & services

National Greenhouse and Energy Reporting Scheme (NGERS)

<http://www.cleanenergyregulator.gov.au/NGER/Pages/default.aspx>

NGERS legislation in place >10 years and administered by the Clean Energy Regulator

Covers primary and secondary energy consumption and production and emissions

NGERS Act requires most medium and all large energy producers and users and emitters to report annual energy production and consumption by energy type and by purpose (eg for electricity generation, other stationary energy, transport, non-combusted)

Reporting threshold is production and/or consumption of 100 TJ or more for facilities, or production and/or consumption of 200 TJ or more for corporations

We access annual data via a data sharing agreement to compile Australia's energy statistics

Energy consumption data sources/methods

Significantly more challenging to estimate energy use for other end use sectors

Most are estimated or modelled using regressions and/or growth methods

Data sources used include range of activity data, partial surveys



Residential

Estimated using ABS surveys, residential appliance model, regression (includes population, heating/cooling degree days, efficiency, prices)



Commercial and services

Estimated using ABS surveys, NGERS growth, regression (includes industry value added, efficiency)



Transport

Monthly fuel sales, estimated using activity data, ABS surveys, regression

Challenges in end use activity data

Industry value added

- Australian Bureau of Statistics (ABS) stopped publishing some value added series for parts of industry sector in 2017, including Wood and paper products; Textile, clothing and other manufacturing; and Non-metallic mineral products
- While alternatives available in another ABS publication, it is a much shorter time series
- Differences in ANZSIC and ISIC classifications for industry sub-sectors
- Declining number of businesses in some sub-sectors – confidentiality issues emerging

Transport activity

- Data on transport activity comes from the Bureau of Infrastructure, Transport and Regional Economics
- Generally reliable with good coverage, but can have delays in availability
- Challenge to split passenger and commercial for utes (pick up trucks)

Challenges in end use activity data

Residential dwelling data

- Data on number of dwellings is only available every 5 years when a census is done. In other years data has to be interpolated or extrapolated

Residential appliance data

- Number and energy use of domestic appliances comes from Residential Baseline Study commissioned by DISER. Stock model includes building and appliance estimates
- Last published in 2015 and data for subsequent years is estimated. Update due soon
- Top down modelled energy use in national balances does not match bottom up estimates of energy use for heating, cooling, lighting, appliances

Commercial buildings

- Currently limited information. Commercial Buildings Baseline Study last updated in 2012 (update due soon). No national surveys of commercial energy use
- Investing in new information sources using data science

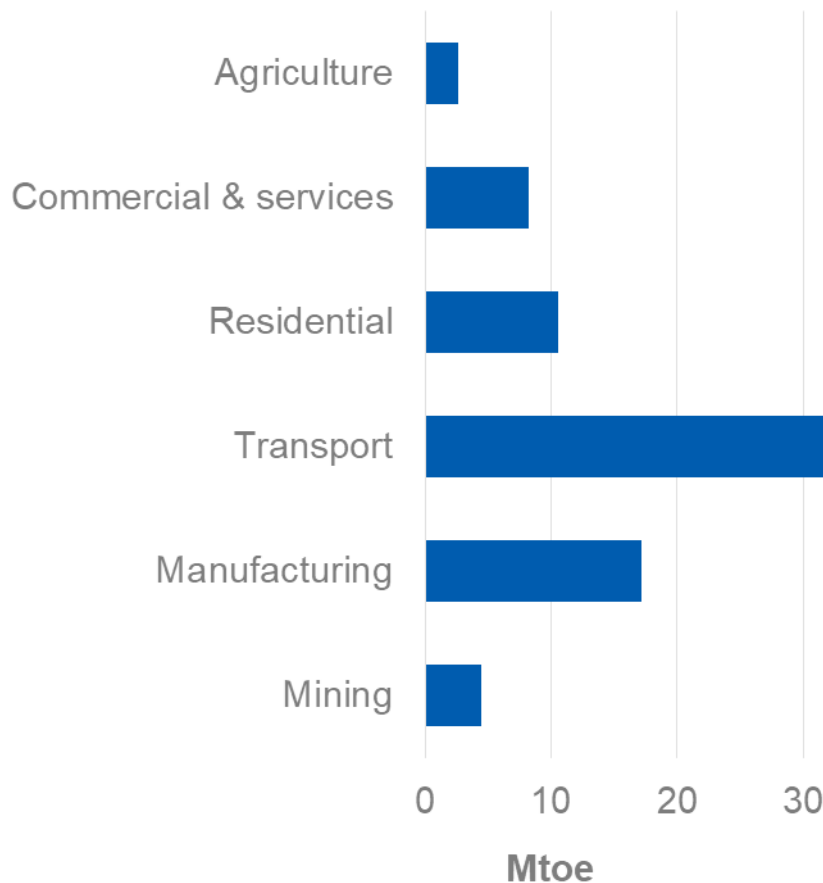
Non-buildings commercial & services

- No data available, no estimates made

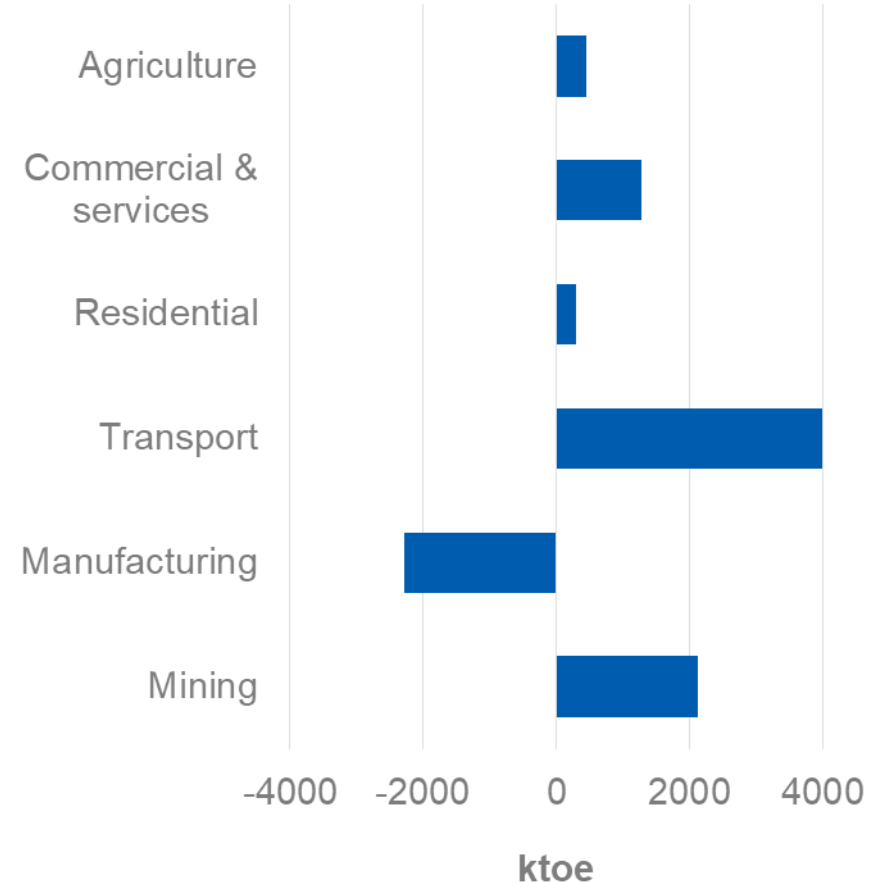
Why is good end use sector activity data important?

Because Australia's energy use is changing

Final energy use 2018

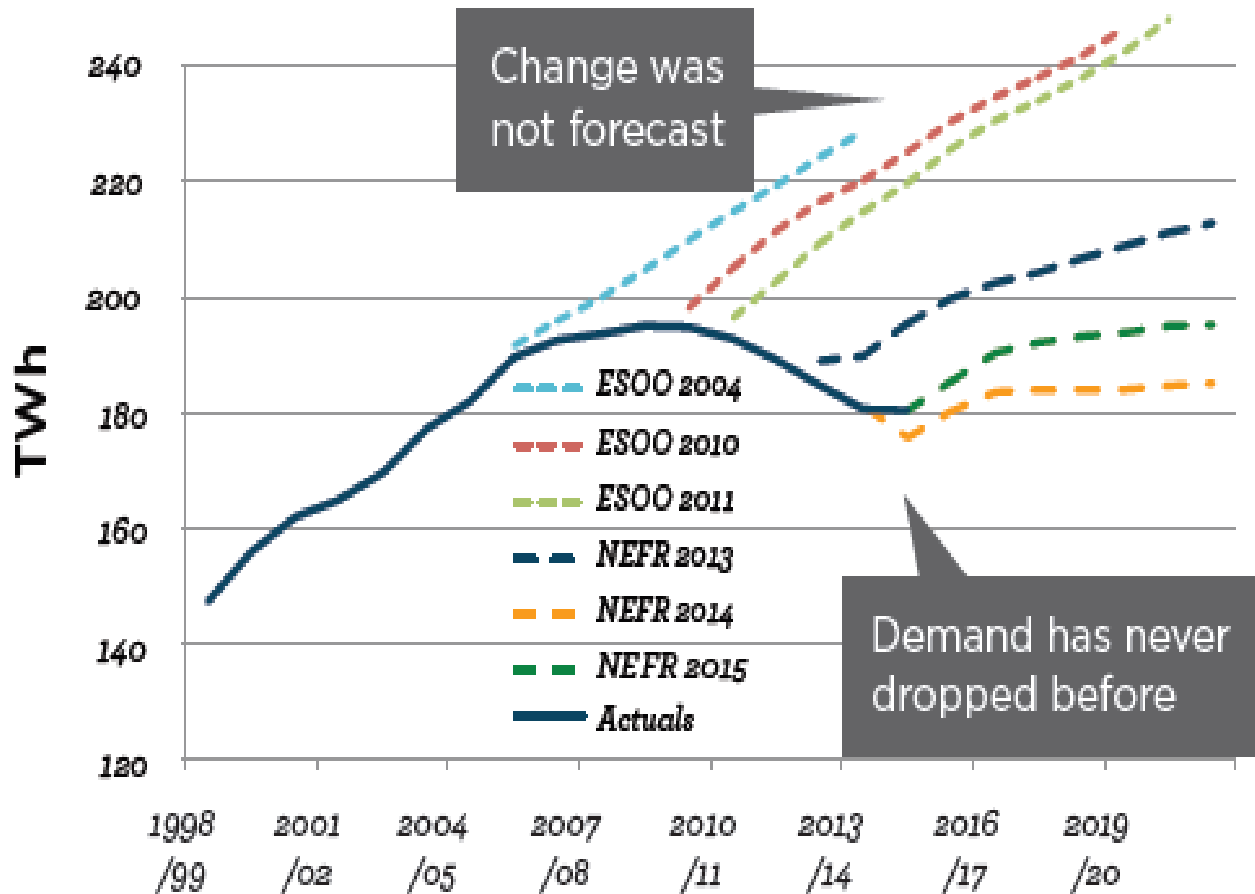


Change in final energy use 2010-2018



Understanding these changes is critical to planning

Historical forecasts of electricity demand in Australia's National Electricity Market



ESOO: Electricity Statement of Opportunities; NEFR: National Electricity Forecasting Report

Electricity demand had previously grown steadily each year driven by GDP and population

Growth slowed in late 2000s then declined from early 2010s (has since rebounded in recent years)

The fall in demand was not predicted

Billions of dollars spent in network over-investment and poor planning (gold plating)

Significant electricity price rises as a result

Highlighted data gaps on end use sectors

Investing in new data sources and techniques to better understand end use sectors

For example: National Energy Analytics Research (NEAR) Program

- \$20 million in government funding to set up partnership between Australian Government, CSIRO (national science research agency) and Australian Energy Market Operator
- Aims to unlock, create and integrate data sources and research to understand and predict energy use in Australia
- Enables the use of data science and new/ advanced analytical techniques
- Legislation barriers preventing data access (eg to meter data) has affected its success to date
- Hard to align research delivery times with rapidly moving policy priorities
- <https://near.csiro.au/>

NEAR scope includes:

- Energy consumption
- Pricing and network data
- Demographics
- Buildings
- Technology
- Geography
- Weather
- Economy

NEAR project to improve building energy use data

- NEAR program is building a national buildings stock model
- The project aims to map and understand the building stock and energy consumed in each sector.
- It will fill critical data gaps on commercial building numbers, types and characteristics, and their energy use
- This is being done using satellite-derived spatial data and linking a diverse range of datasets (e.g. local government records, industry association databases)
- Will be an evidence base for development and evaluation of building energy efficiency policies and programs.
- Will also hopefully support better reporting in the energy efficiency questionnaire!

