Australian Government
Australian Renewable Energy Agency

Australian Government
Department of the Environment and Energy

Data informing optimal energy policy and investment

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Australian examples

Improving quality and access to energy use, resource and infrastructure data

1. Energy Use Data Model

2. Australian Renewable Energy Mapping Infrastructure (AREMI)

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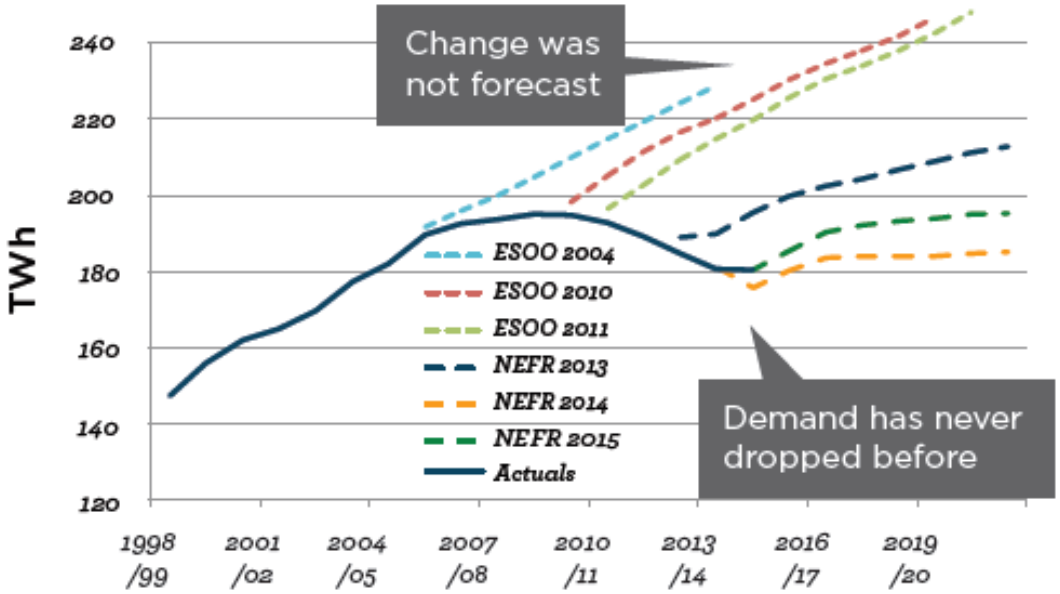
‘Top down’ forecasting models used to work

Until electricity demand started to decouple from population and GDP growth in Australia around 2004:



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

Inaccurate forecasting = expensive problem

The forecasts on the last slide contributed to **billions of dollars** of over investment in the electricity network

Understanding energy demand is critical to forecasting and informing investment decisions for new generation and distribution infrastructure

We need better data to support better forecasting

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The data we need

The energy market is changing at an unprecedented rate:

- Consumer uptake of new technologies, like PV, more energy efficient appliances, battery storage and electric vehicles can have a huge impact on demand

- Minimum performance standards for common white goods, and efficiency requirements in the Australian building code also changes demand

- Consumer fuel switching, from gas to electric appliances and vice versa is also important

- Currently, energy data and demographic information is dispersed among many data holders, is inaccessible, or doesn't exist at all.

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The Energy Use Data Model will provide this critical information

The Australian Government has committed $6 million to the development of an Energy Use Data model

The Energy Use Data Model will link energy use data from around Australia with new ‘behind the meter’ behavioural data

It will become Australia’s most comprehensive set of integrated energy use data and enable insight into the fine-grained behaviour of energy consumers and the aggregate response of populations

It will be publically accessible through a central platform, while ensuring privacy protections remain in place

The model will be ready for deployment in 2018

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The energy use data model will be developed over 3 years and includes 5 work streams

1 Deep and ongoing stakeholder engagement

Working with energy sector stakeholders to determine the critical facets of a fit-for-purpose national energy use data model.

2 Data sampling and collection

Addressing high-priority gaps and developing statistically and ethically robust sampling methodologies for the collection of new primary energy data.

3 Fusion of data sets

Bringing together high-quality pre-existing datasets to provide a comprehensive view of the key energy data domains.

4 Data innovation

Leveraging cutting-edge science and research to proactively manage data privacy and delivering new insight and value for energy sector stakeholders.

5 Interactive data

Develop a robust, user-friendly and visually appealing method for accessing all elements of the final energy use data model.

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AREMI Project

A freely accessible online map - 650 layers of information about:

- Energy resources – solar, wind, marine, biomass, geothermal
- Grid & Substation Infrastructure - Constraints and Capacity
- Generation performance – real time
- Environmental information, land tenure, topography
- Demographics and Household Energy Demand
- In future - ARENA projects – LCOE and performance and large energy users energy demand

Supported by ARENA funding and available at:
www.nationalmap.gov.au/renewables

Visual and deliver quickly, reiterate wildly

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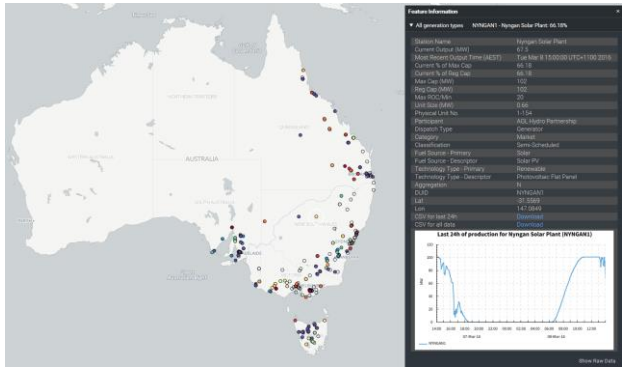
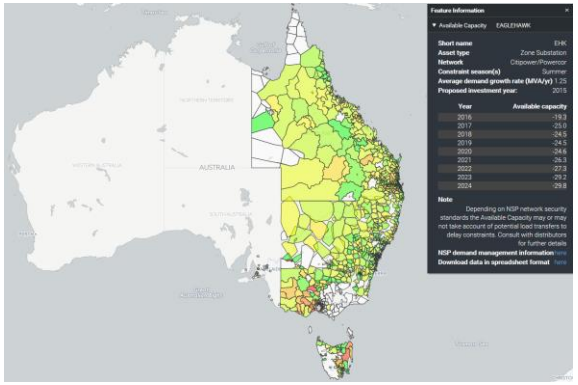
AREMI Project

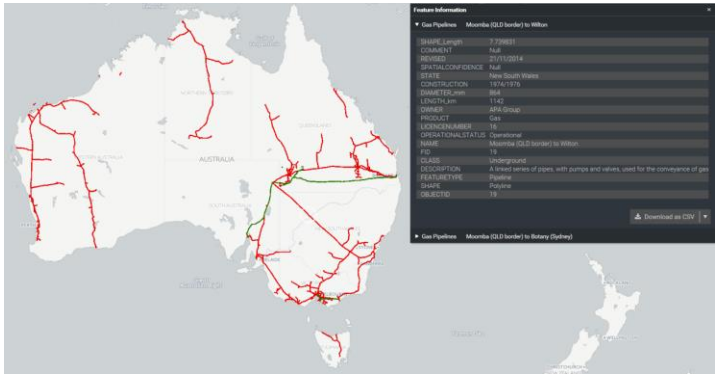


Existing power generation

Transmission lines and substations

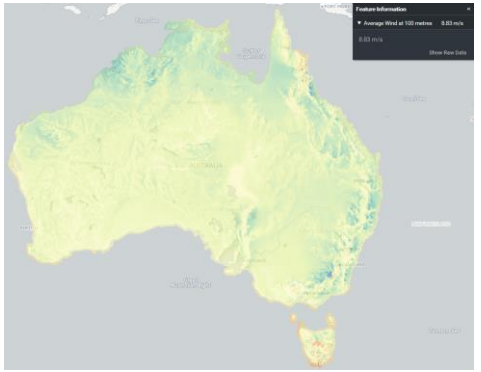


Grid constraints

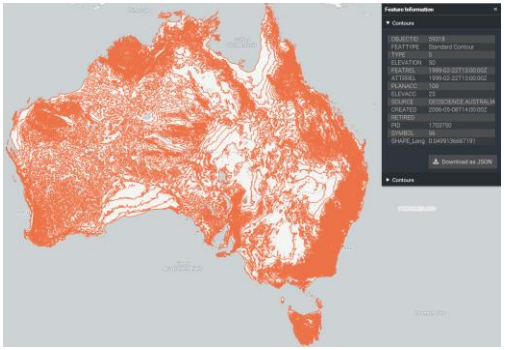


Oil and gas pipelines

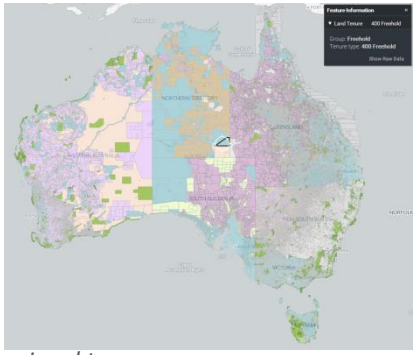
Solar radiation



Wind speed



Topography



Land tenure

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Why is accessible energy data so important for least cost energy transition ?

Energy system is changing

Renewables are location and time bound

What is cost effective in one region and time is not in another

Modelling Tools of the future need to factor in :

- the time and regional nature of renewables and
- demand side - use technologies and policies – storage, inverters, smart meter, efficiency

Least cost low carbon energy systems will be an optimal mix of demand and supply side options

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Overall approach

Support potentially required to obtain data

Obtain energy resource, demand, supply, cost and infrastructure data e.g Energy Use Data Model

Australian examples that can be leveraged (AREMI Project)

Disseminate through publically available and understandable medium e.g. AREMI

Methods can be informed by best practice from international community

Optimisation modelling and analysis that can deal with interaction between energy demand and supply to identify

- Least cost optimal low carbon energy system
- Opportunities for efficient infrastructure investment

Develop policies, market structures and investment frameworks to support / encourage deployment of least cost low carbon energy technology and actions

- Investment to underwrite clean energy policy frameworks and infrastructure

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Disseminating energy data

Open, publically available data is vital

- Reduces barriers and improves access to all market participants

Visual means of disseminating data can improve understanding

Supports evidence based decision making

- Objective information to inform energy infrastructure investments

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