



Unlocking the Power of Demand Response

November 2017

Our vision

To deliver energy security for all Australians, and meet the changing needs of the market by involving multiple jurisdictions, participants, and communities.



We operate Australia's National Electricity Market and power grid in Australia's eastern and south-eastern seaboard, and the Wholesale Electricity Market and power grid in south-west WA.



We also operate retail and wholesale gas markets across south-eastern Australia and Victoria's gas pipeline grid.



We are a company with three control centres and multiple offices across five States. Our costs are recovered through fees.



Ownership

40%

Market participants

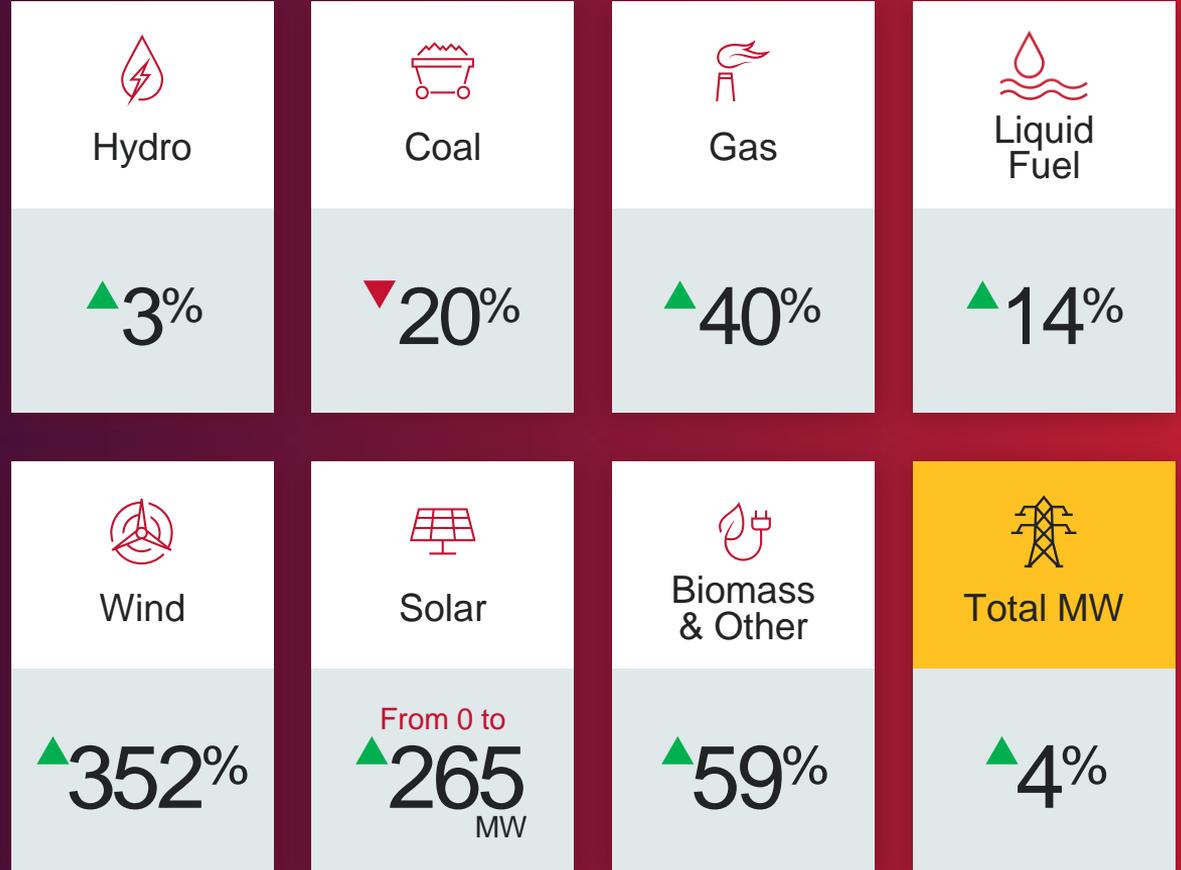
60%

Governments of Australia

The changing generation mix

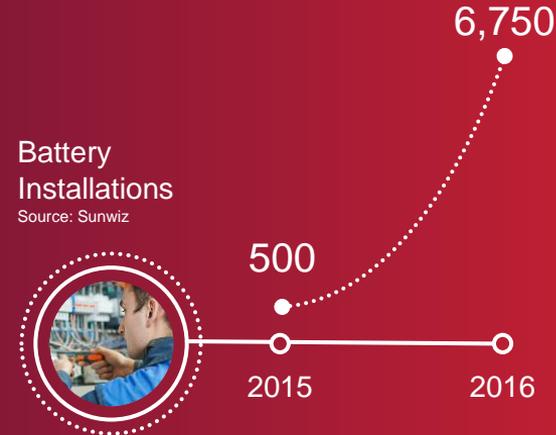
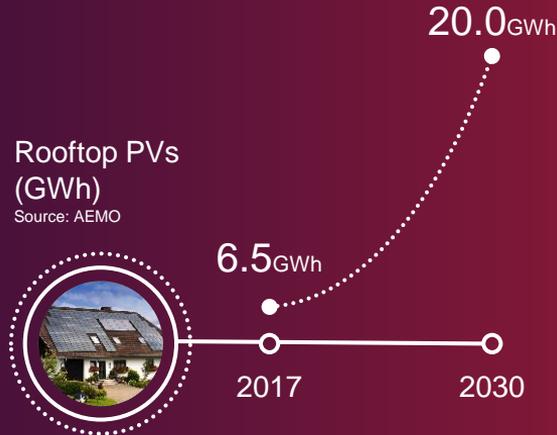
(2008 – 2017)

The Australian energy landscape is shifting towards renewable power



Two-way power grid evolution

Huge growth in customers providing energy back to the grid.



By 2050
customer-owned
generators will supply



30-45%
Australia's electricity needs

Source: CSIRO

Managing security and reliability in a transforming system

Resources required – not just conventional generators but other solutions...

DR is key part of the resource mix...



Economic Demand Response – signals within the energy market.



Ancillary Services



Reliability and Security reserve – through reserve procurement that sits outside the market.

Ancillary Services & DR

Rule changes were made in 2017 better encouraging DR in the provision of Ancillary Services

In 2017, the Australian Energy Market Commission:

- **Made rules allowing DR provision to be unbundled from retailers – allowing aggregators to provide services.**
- **Effective – 1 July 2017.**
- **To date: approx. 500 MW but expect this to grow over time.**

Finkel report:

- **Recommended review the Demand Response Mechanism – economic DR.**

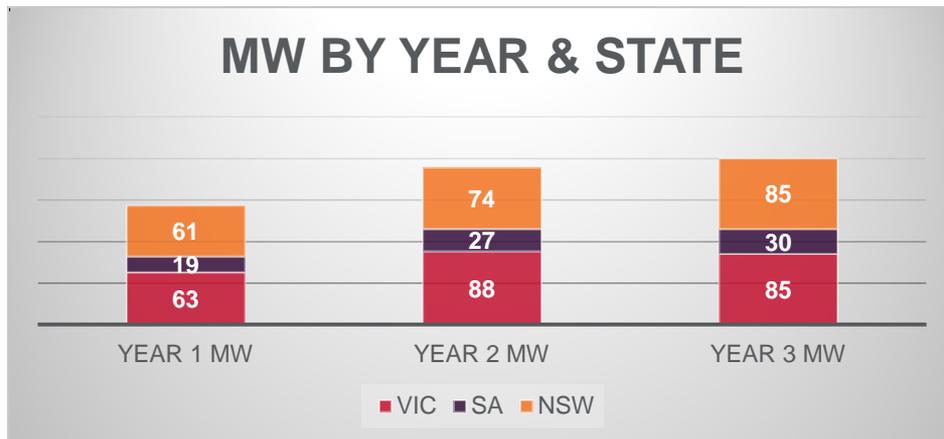
Reserve Market

AEMO/ ARENA DR pilot ...

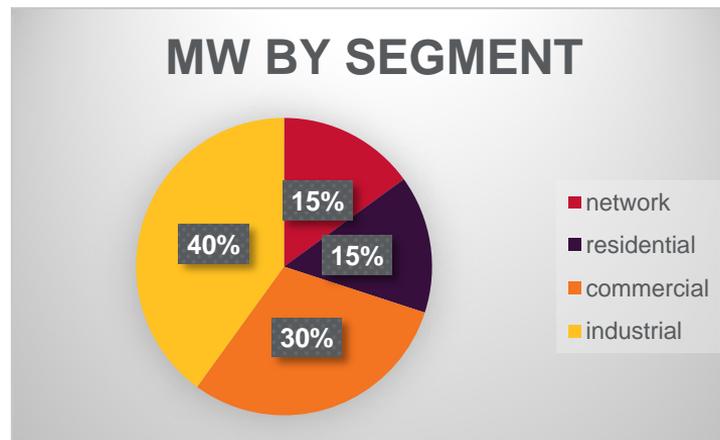
Three year pilot program supported by \$37.5 million funding.

Pilot DR reserve services under a Strategic Reserve Design.

MW BY YEAR & STATE



MW BY SEGMENT



Summer Readiness 2017/18

- DR is a key part of AEMO's summer readiness plans through the Reliability and Reserve Trader (RERT)
- Demand response programs have procured between 700 MW - 900 MW across Victoria and SA

AEMO's six point summer readiness plan

- **Supply availability:** Limiting scheduled summer maintenance of generators and requiring all mothballed fleet be made available from October 2017.
- **Fuel availability:** Ensuring generators have enough fuel available to generate electricity at peak times.
- **Network availability:** Ensuring required transmission network capacity is available and scheduled maintenance during summer is minimised.
- **Peak demand response:** Through RERT accessing embedded generation and incentivising large consumers to reduce peak demand by load shifting.
- **Resilience and recovery:** Emergency event planning and exercises to maximise power system resilience and recovery.
- **Operational changes:** Improvements in reserve management, increased training requirements for operators, enhanced information requirements from generators

Beyond this summer

- AEMO is working with industry to design a Strategic Reserve mechanism to be available for summer 2018/19.
- Learning from RERT, ARENA/AEMO DR program and international counterparts.
- While technology neutral, DR will play a key role.

Key principles for Strategic Reserve Design

Last alternative	Out of market	Extreme events	Lowest cost
Act as a last alternative to load shedding and used only during periods of scarcity /system security	Seek to procure resources that not otherwise operate in the energy market	Intended to be rarely activated, with not every product necessarily used in every year	Expected that resources have low availability costs but comparatively high usage costs

Designed six products

- Summer & Non – Summer
- 10min, 60 min, 24 hrs notification period.
- Working through payment structures.

Unlocking the potential value of DR

It's a resource to be valued.

DR programs have been used around the world for decades as a cost effective resource to maintain a reliable grid....

- **Texas last year had 3,616 MW of demand available to be called on as part of its response reserve service.**
- **Other systems, covering groups of US states, can decrease use by between 3% and 7% of peak demand.**
- **Demand response was used in California in 2012 to ramp up efforts to cover generation shortfalls.**
- **In the summer of 2013, peak demand in New York was reduced by over 1,000 MW in response to reliability concerns.**
- **In PJM, the market operator used around 1,600 MW of the over 9,000 MW of demand response at its disposal.**
- **Japan turned to demand response as part of the solution after the Fukushima nuclear disaster.**
- **Korea introduced laws in 2014 encouraging its use.**