Why a DMIS?

From consumers' interest to economic imperative

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(Lead author: ***Restoring Power*** for TEC DMIS Rule Change Proposal)

Presenting on behalf of Total Environment Centre

AER DMIS Workshop: 20 Sept 2016

UTS
UNIVERSITY OF TECHNOLOGY, SYDNEY

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Total Environment Centre
for the future

http://www.tec.org.au/images/reports/Restoring%20Power%20-%20DMIS%20Final%20Report%2020%20Nov%202013.pdf

RESTORING POWER:

Cutting bills & carbon emissions with Demand Management

November 2013

A report for the Total Environment Centre

Institute for Sustainable Futures

UNIVERSITY OF TECHNOLOGY SYDNEY

OVERVIEW

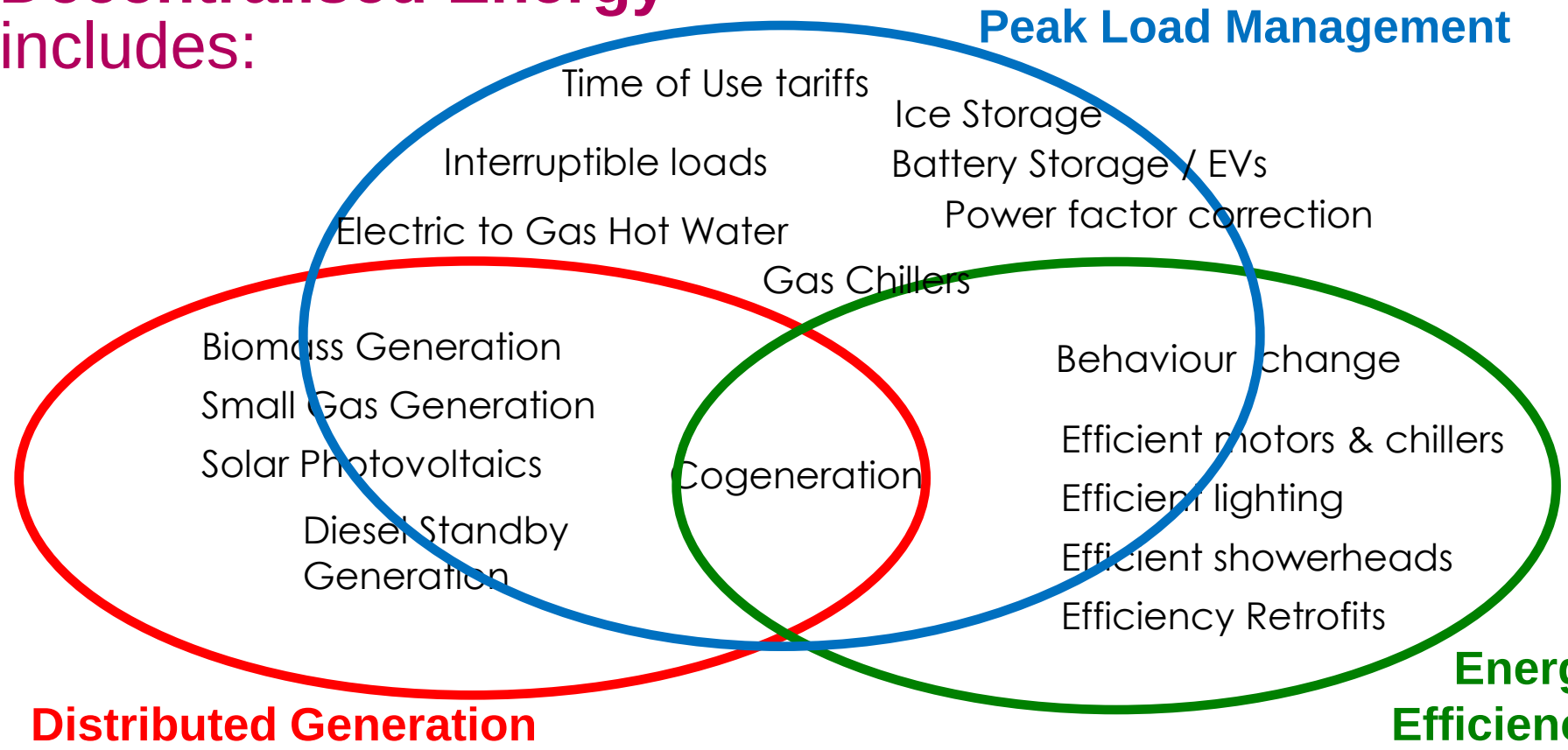
1. Why a Demand Management Incentive Scheme (DMIS)?

   - From consumers' interests to economic imperative

2. The key themes for a DMIS

3. Design elements of a DMIS

Decentralised Energy includes:



DEMAND MANAGEMENT (DM) **is**:

… *deliberate* action *by a supplier* to reduce demand for a commodity *instead of providing supply to* meet demand.

ELECTRICITY NETWORK
DEMAND MANAGEMENT (DM) **is**:

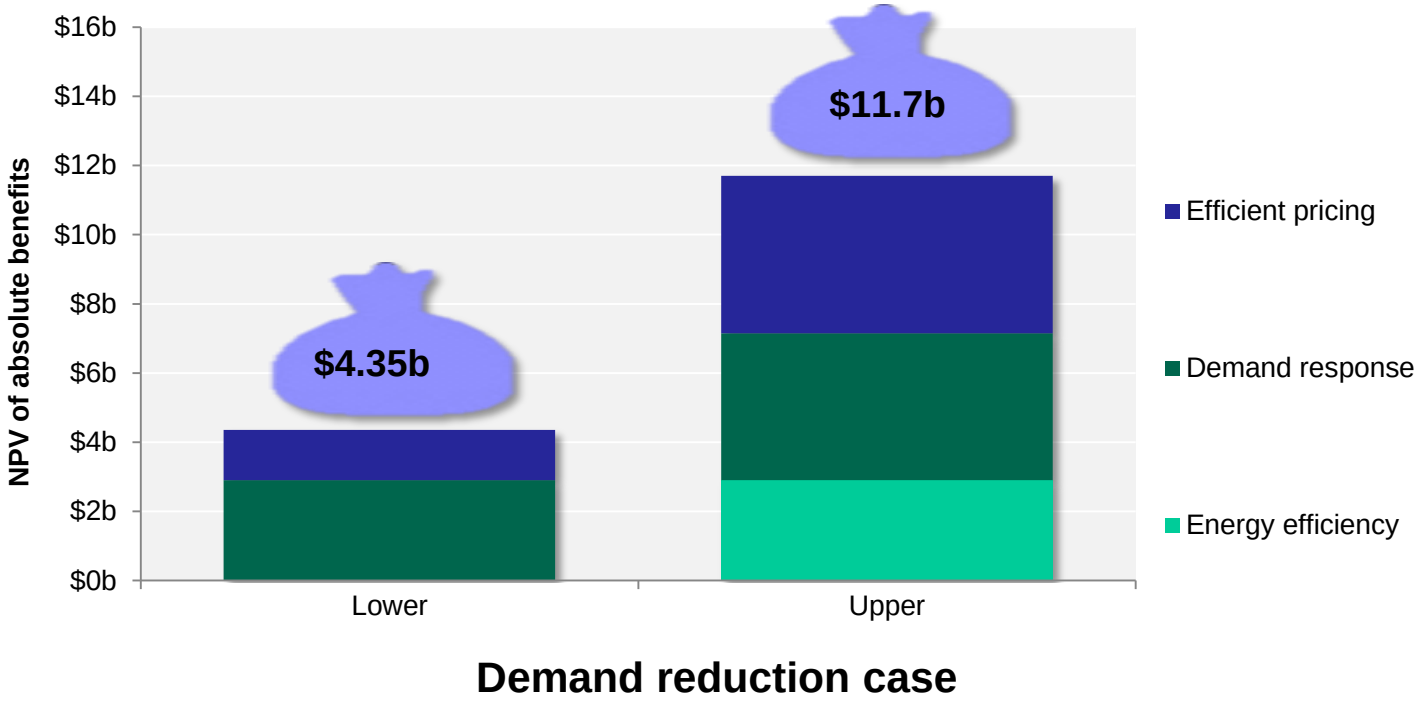
… *deliberate* action *by a network business* to support Decentralised Energy *instead of* network infrastructure.

WHY A DMIS?

CONSUMERS' INTERESTS

1. A DMIS could unlock $billions in DM savings

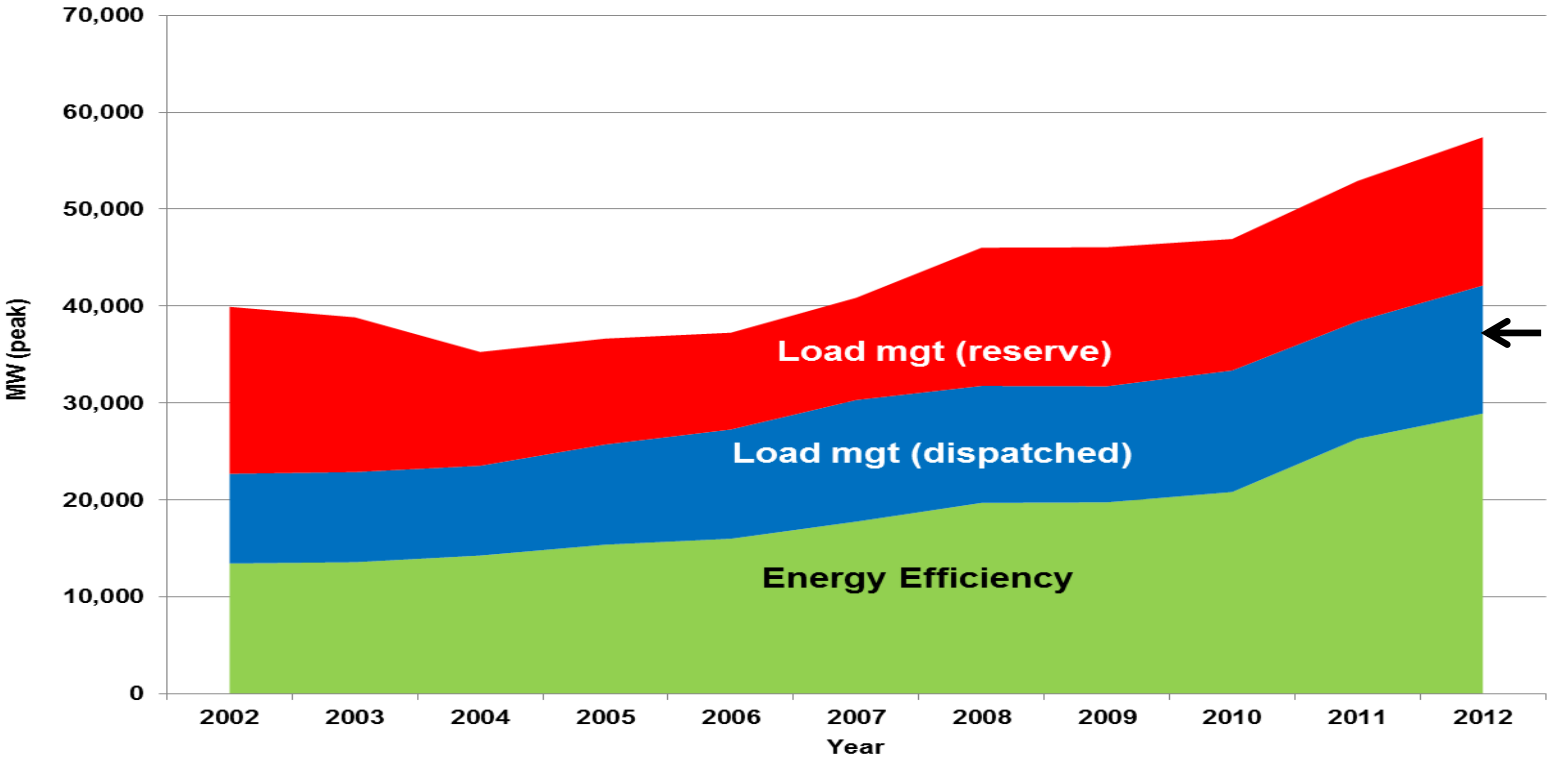
Total benefit of demand reduction in the NEM (2013/14 to 2022/23)



Source: AEMC **Power of Choice** Review Final Report, 2012

Utility DM in US: Outcomes

(based on annual utility *reporting*)



Source: US Energy Information Administration

Utility DM in US: Outcomes

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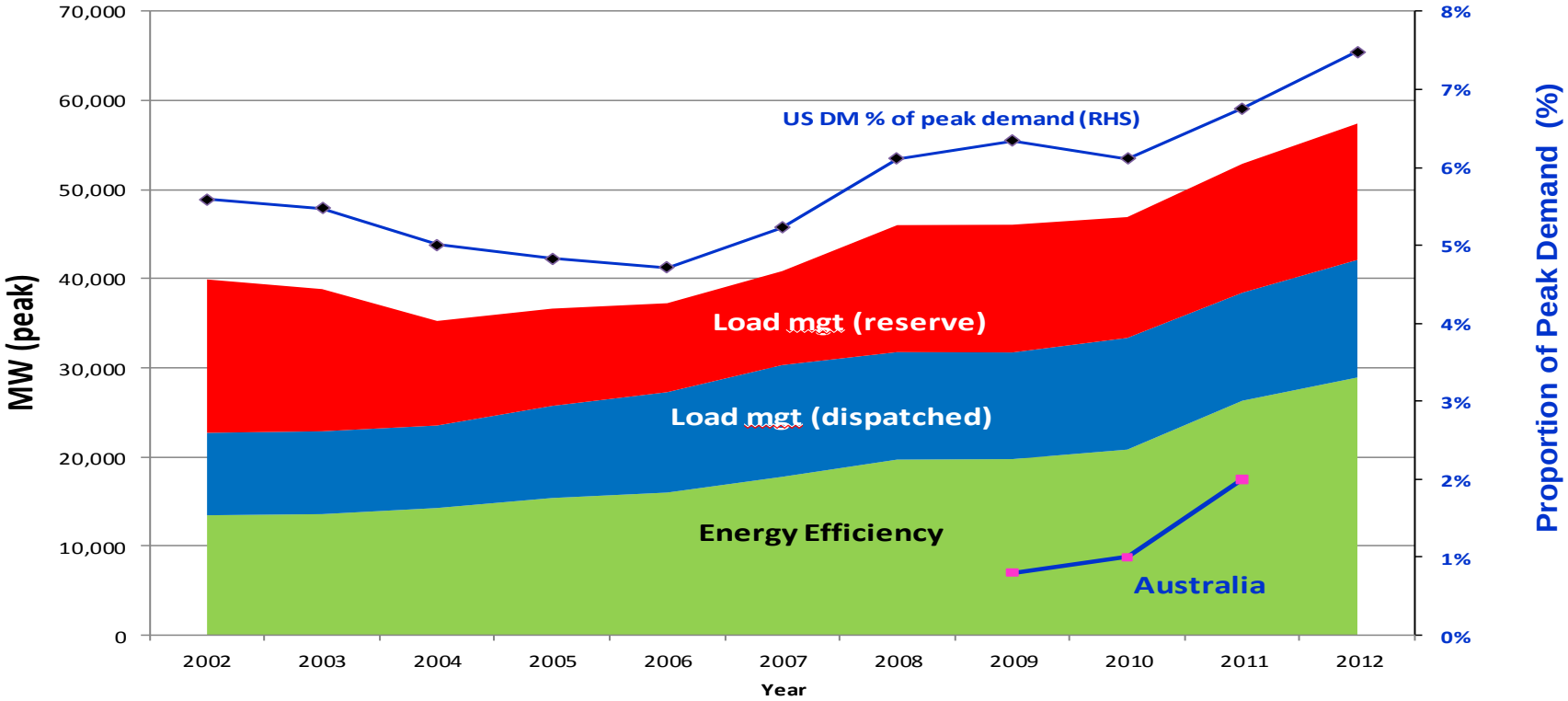
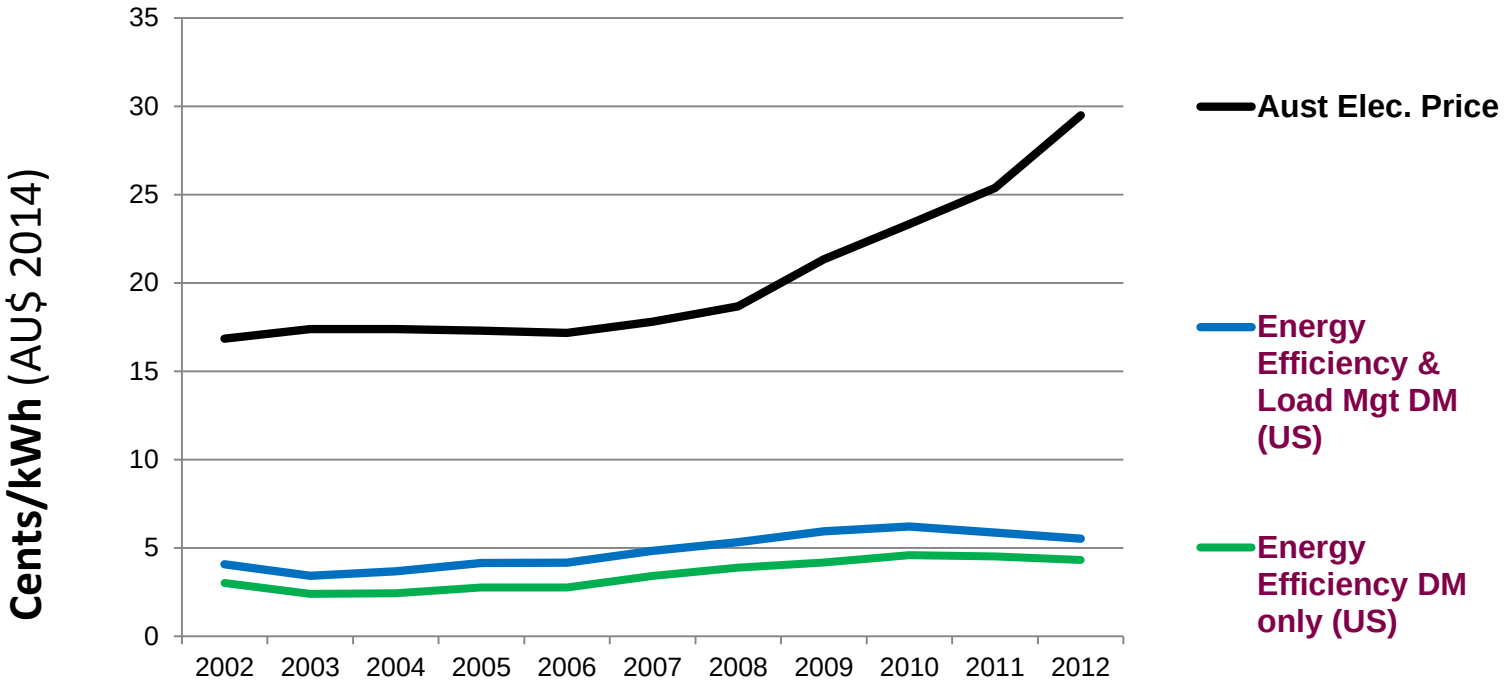


Source: US Energy Information Administration, ISF

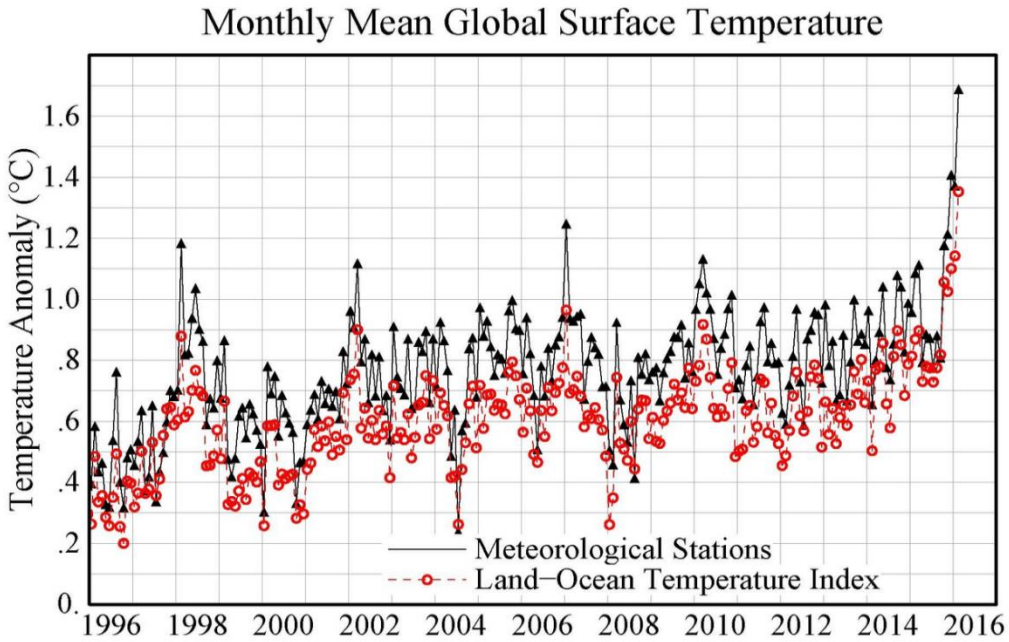
DM is cheap! Cost of US Utility DM vs Aust Retail Electricity Price



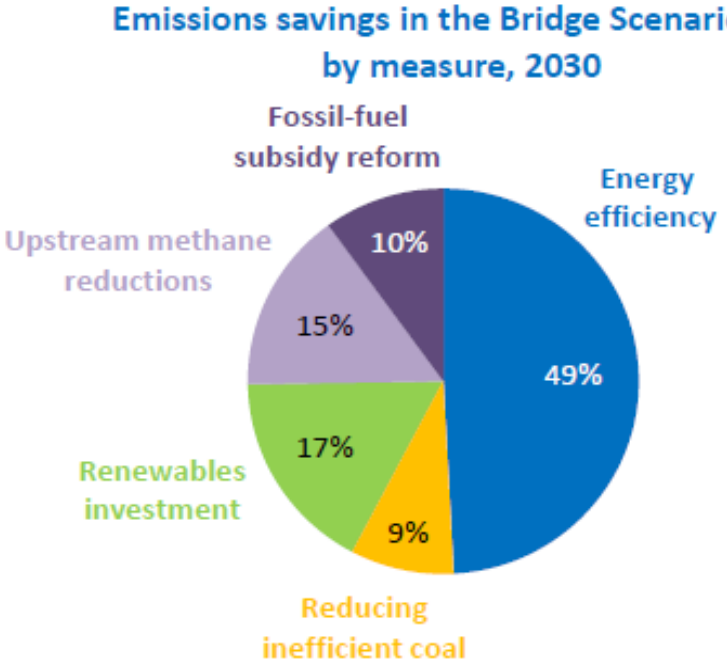
Source: US Energy Information Administration, ABS, AEMC

A DMIS COULD HELP MEET CLIMATE GOALS

- **Paris Agreement**: To keep global temp. rise "well below" 2ºC & "endeavour to limit" rise to 1.5ºC
- Net zero emissions by 2050 to 2100
- Global temperature records being broken monthly



"Bridge" Scenario for 2ºC



Primavera by Sandro Botticelli (circa 1480)

(We live in properous times- It would be wise to sustain them)

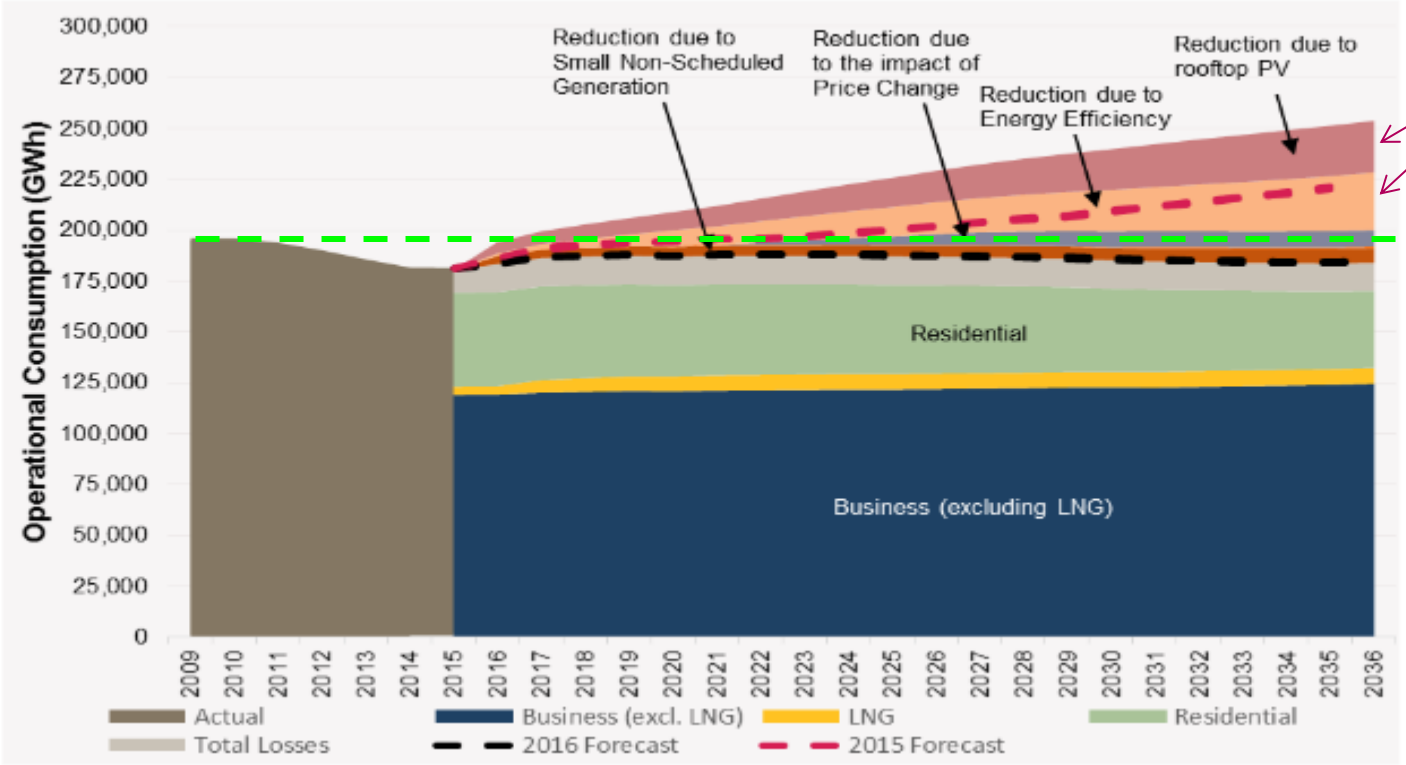
WHY A DMIS?

ECONOMIC IMPERATIVE

THE AGE OF DECENTRALISED ENERGY HAS ARRIVED

FORECAST ENERGY CONSUMPTION IS FLAT, AS DE GROWS

Annual consumption –Neutral case

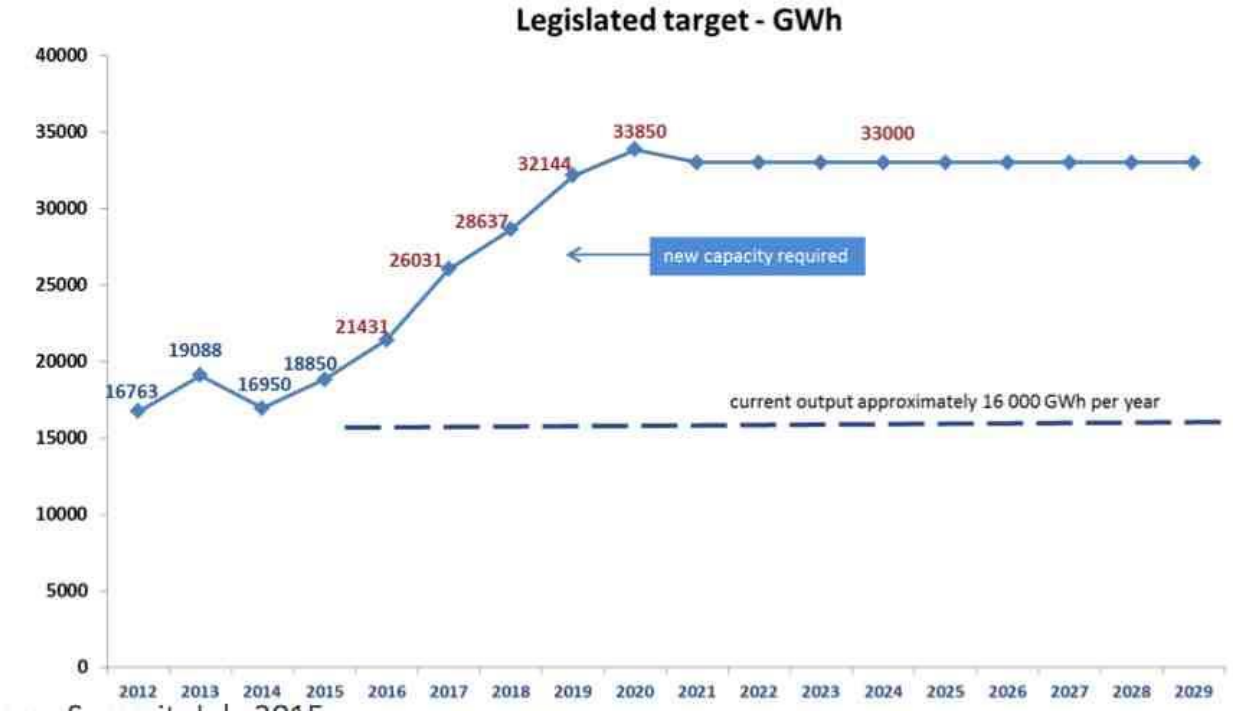


DE

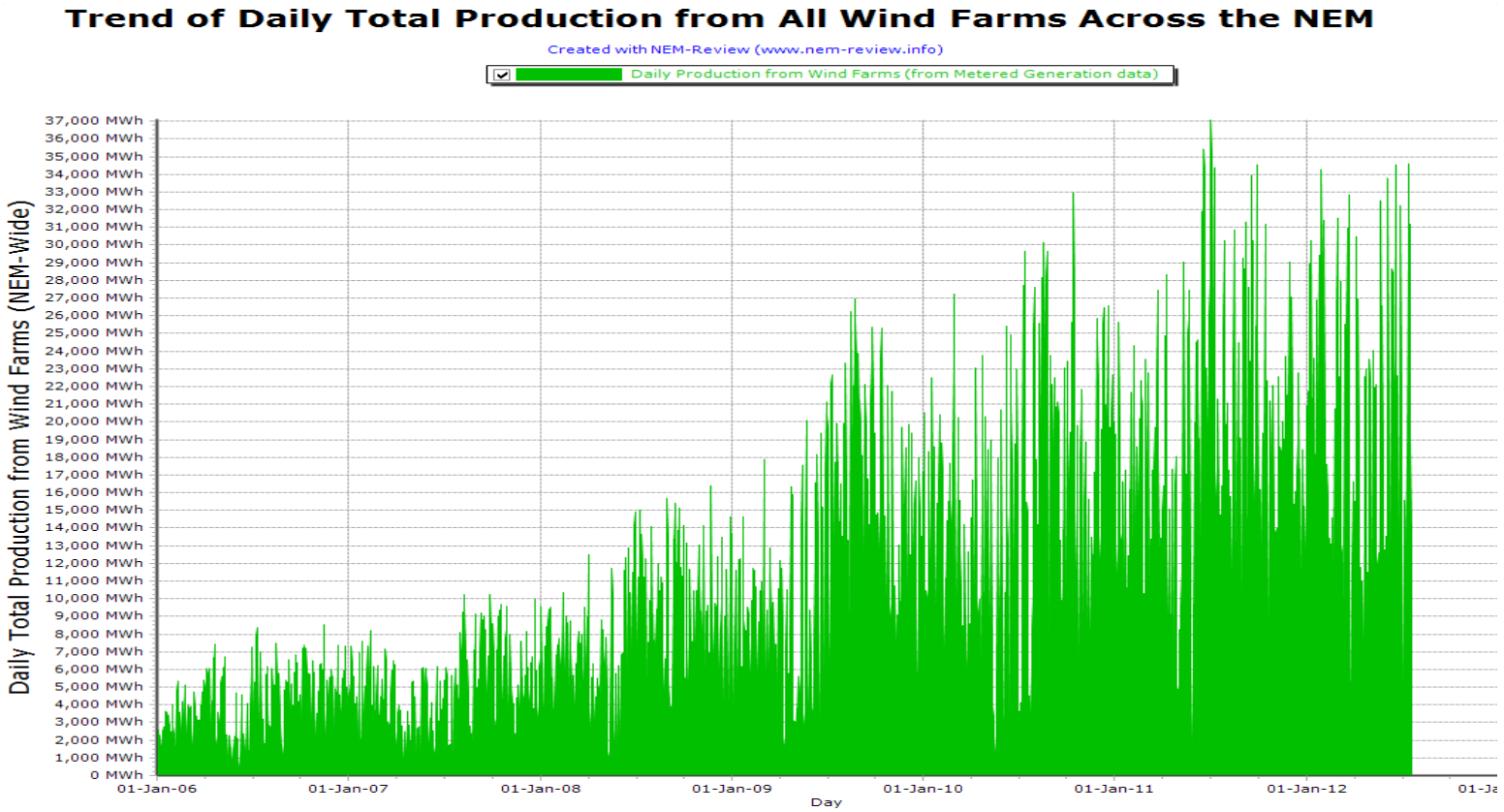
2009 Peak

ANNUAL ENERGY FORECAST FOR THE NEM (June 2016 NEFR)

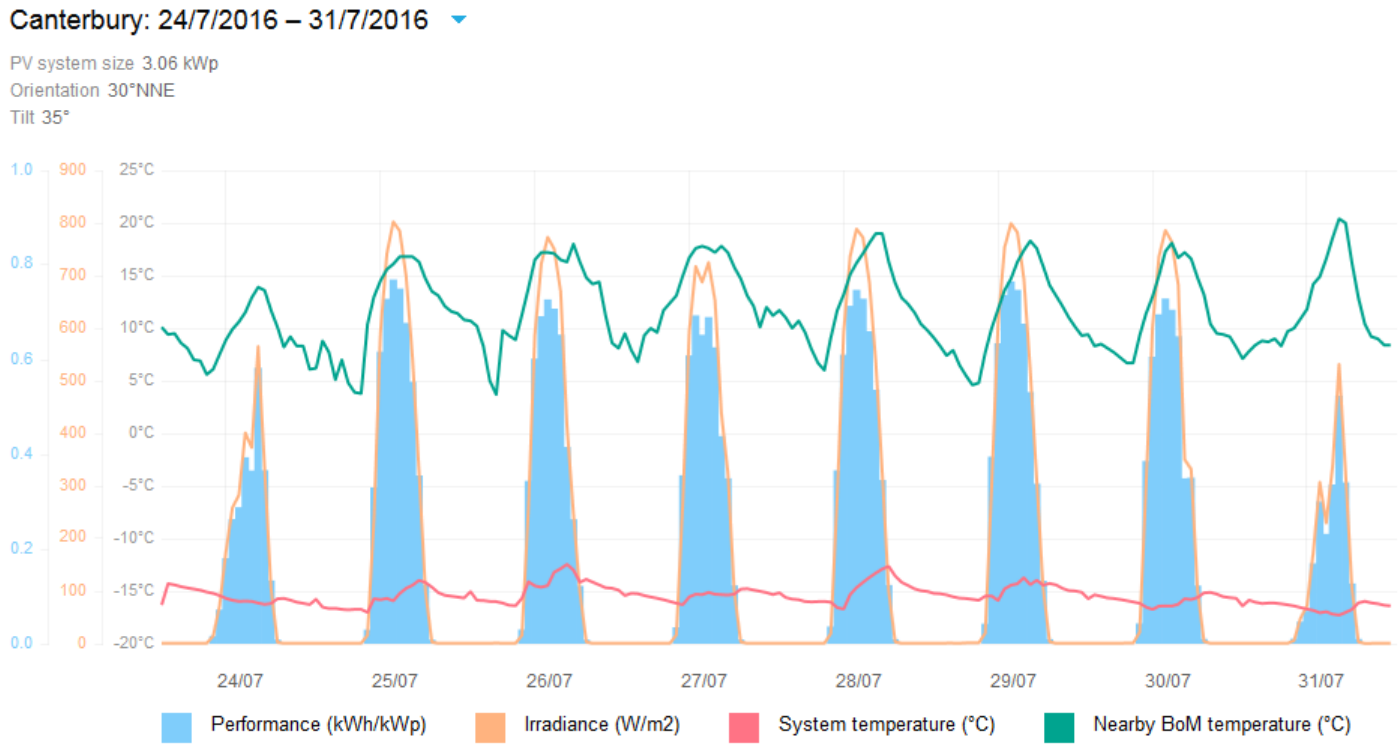
And the RET: Add another ~16,000 GWh p.a. by 2021



WIND IS VERY VARIABLE…

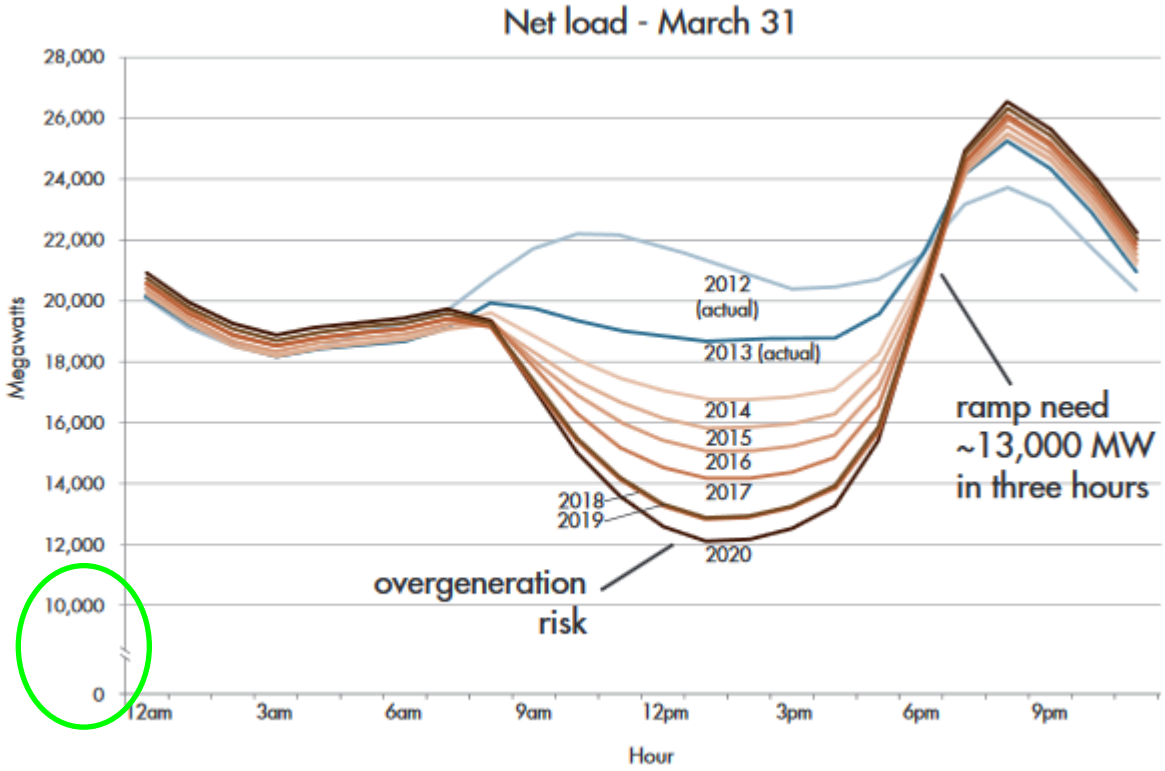


… AND SO IS SOLAR… (SOLAR PV OUTPUT)



THE DREADED “DUCK” CURVE

(Official Californian ISO Load forecasts)

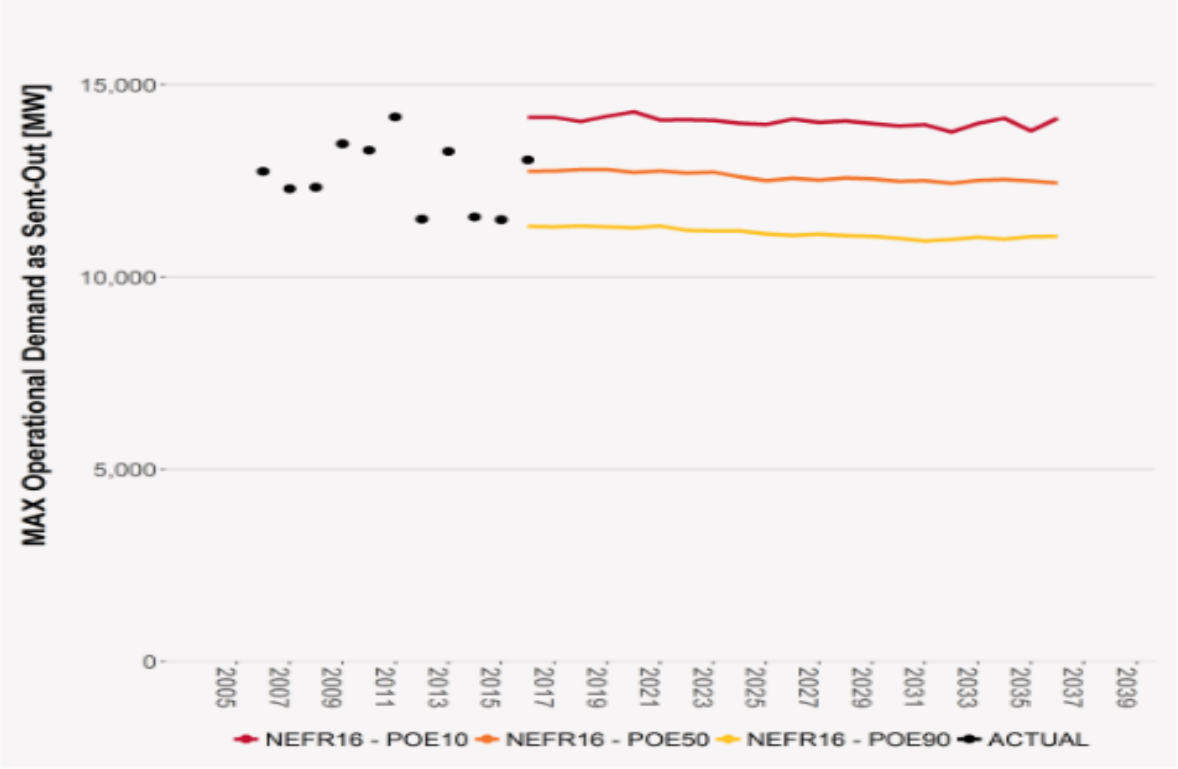


http://www.caiso.com/Documents/FlexibleResourcesHelpRenewables_FastFacts.pdf

NSW MAXIMUM DEMAND – FORECASTS FLAT

*First ever **declining** long term forecast for **peak** demand…*

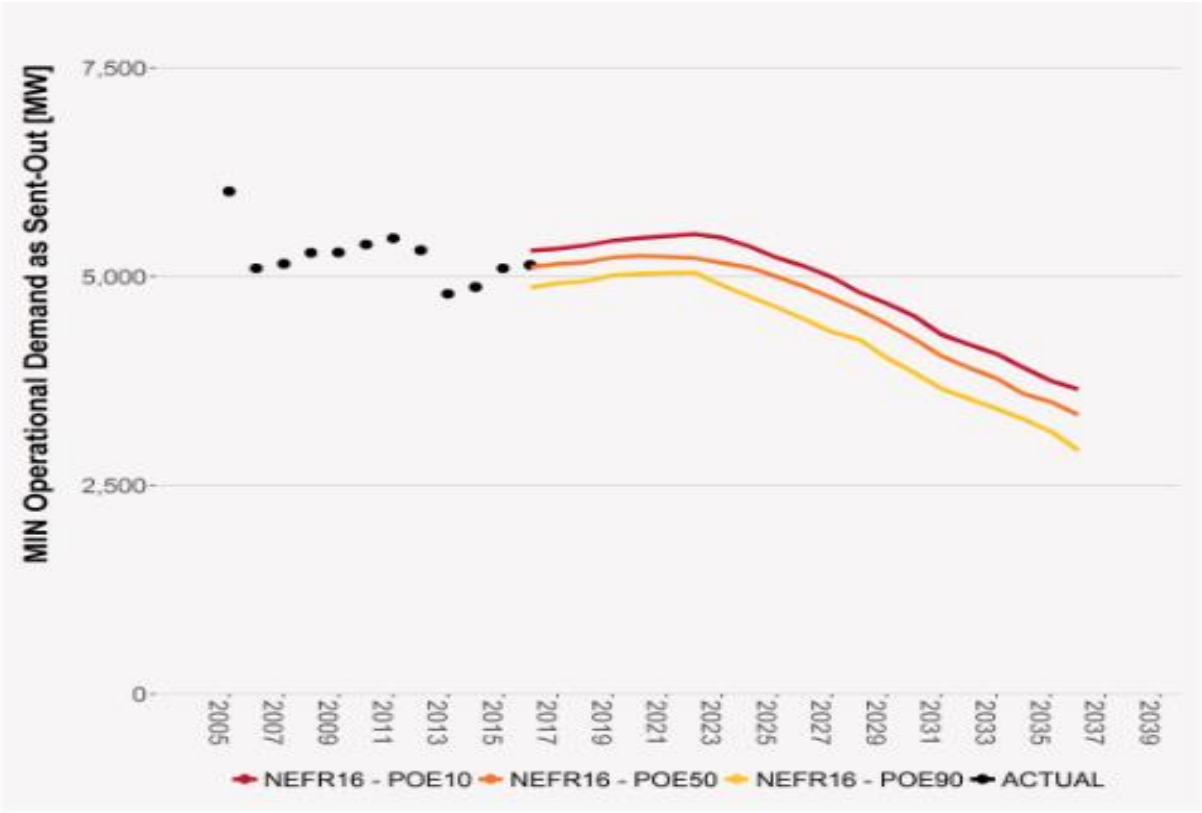
Source: 2016 AEMO National Electricity Forecasting Report (NEFR) (June 2016)



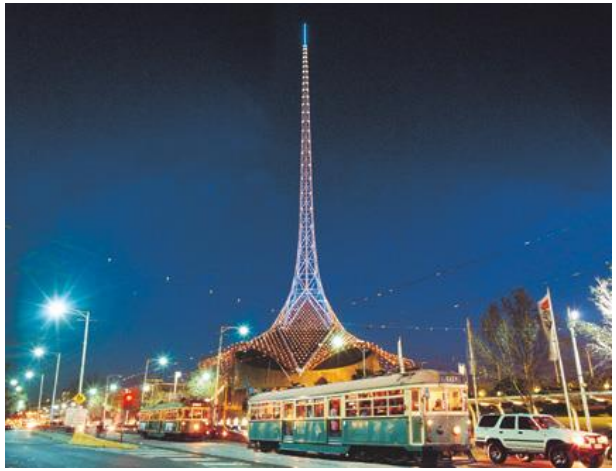
NSW MINIMUM DEMAND – FORECASTS *FALLING*

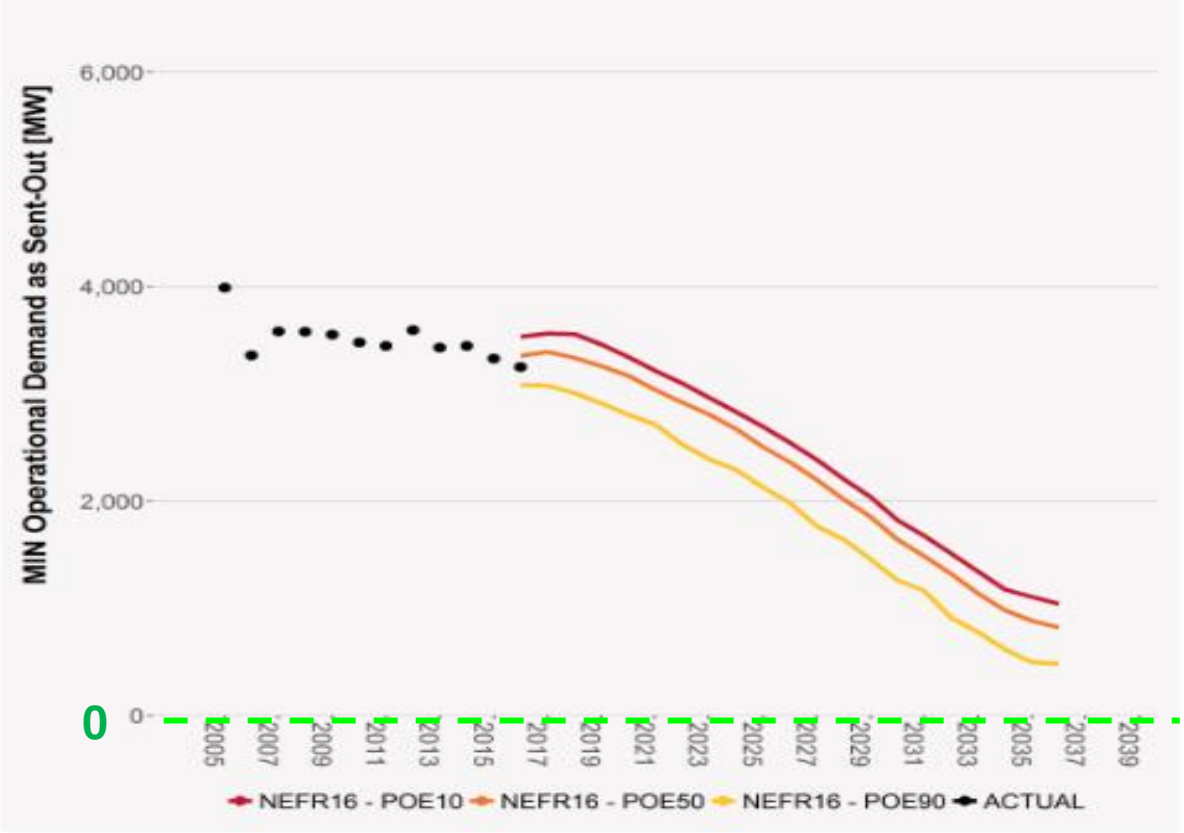
“minimum demand [shifting] from overnight to near midday ...
This is already the case for South Australia” -AEMO

Source: 2016 AEMO National Electricity Forecasting Report (NEFR) (June 2016)



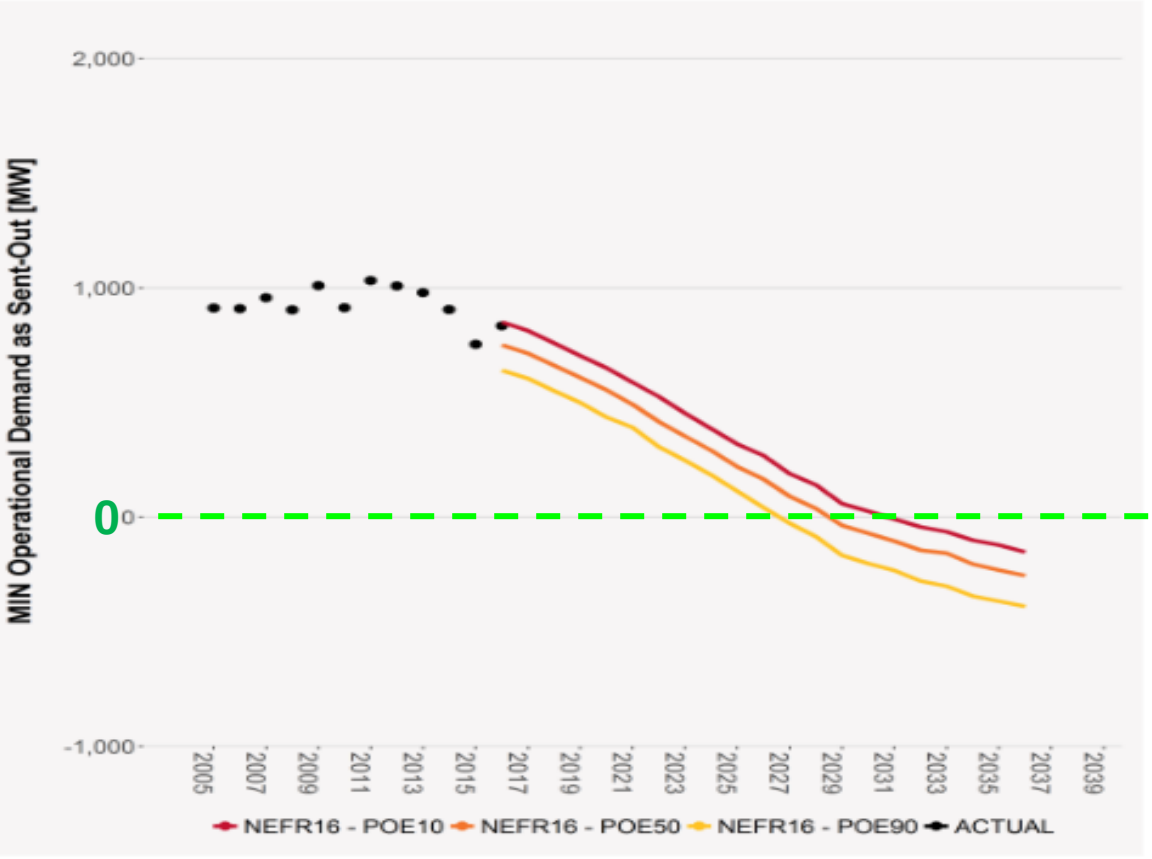
Vic. MINIMUM DEMAND – FORECASTS *PLUMMETING*





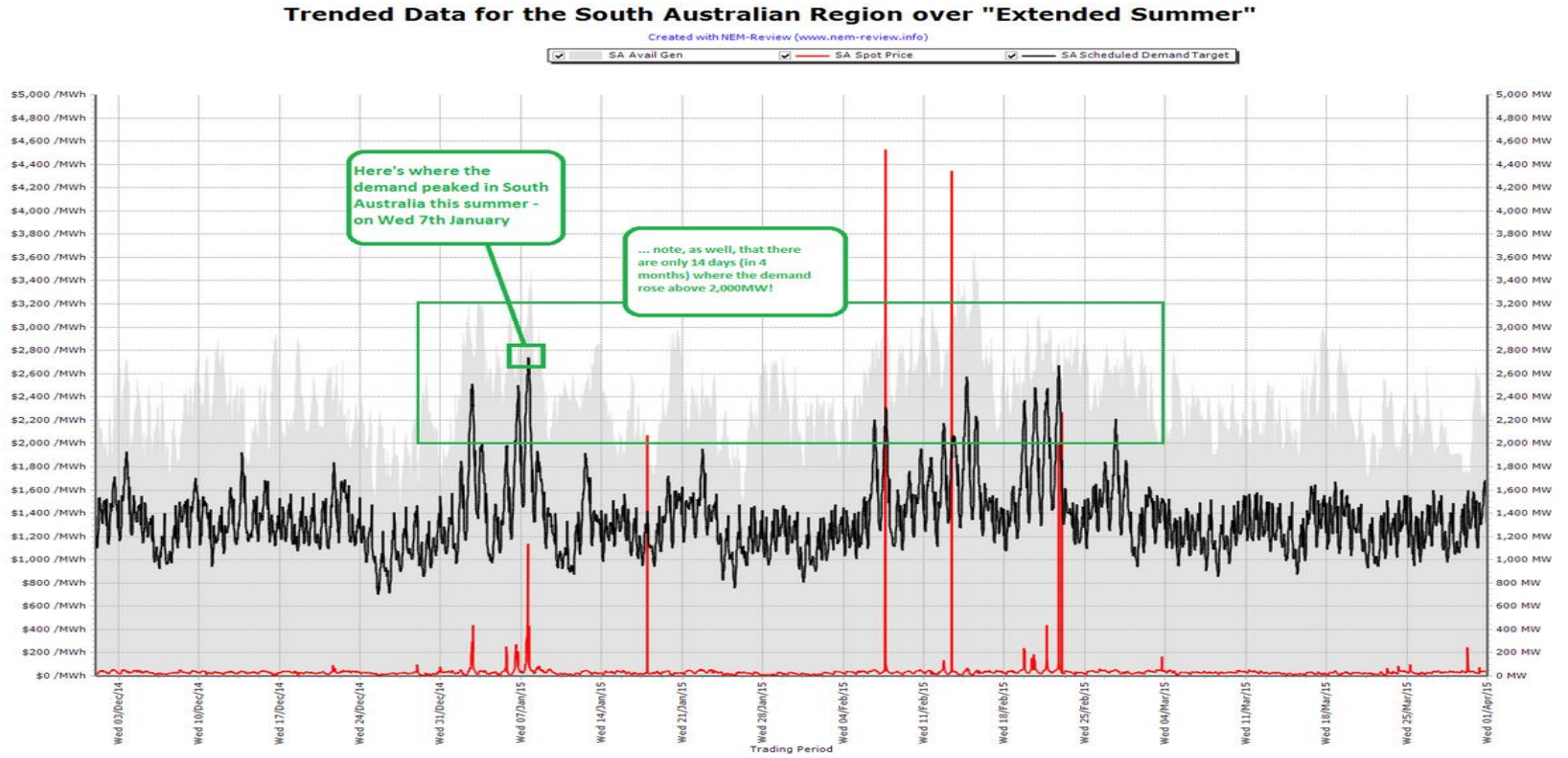
Source: 2016 AEMO National Electricity Forecasting Report (NEFR) (June 2016)

S.A. MINIMUM DEMAND – *Less than zero!?*



Source: 2016 AEMO National Electricity Forecasting Report (NEFR) (June 2016)

Demand as variable as renewable energy



SO WHAT?

1. **Much more variable generation**
2. **Radically shifting local supply and demand patterns**

… *which means either*

1. ***Back up with expensive flexible capacity & interconnectors, or***
2. ***Seek to delay the transition, or***
3. ***Much more flexible DM (incl. price reform)***

… *the latter means*

1. ***Constructive customer-utility collaboration is essential***
2. ***Regulatory reform essential (incl. DMIS)***

KEY THEMES

KEY THEMES FOR THE DMIS WORKSHOP

1. Interaction with the regulatory framework and DM incentives
2. Barriers to DM
3. Interaction with the contestable market in DM
4. Design Element 1: Calculating costs & benefits / funding mechanism design
5. Design Element 2: Scope of projects and application
6. Design Element 3: Data for DM and reporting to verify results

1. REGULATORY FRAMEWORK & DM INCENTIVES

QUALITATIVE FINANCIAL IMPACT OF DM ON NSP

SHORT TERM IMPACT (WITHIN REGULATORY PERIODS)

- ✓ Reduced capex
- × Higher opex (on DM)
- × Loss of electricity throughput *and revenue loss* (if under a price cap)

LONG TERM IMPACT (ACROSS REGULATORY PERIODS)

- ✓ Lower total cost of capital
- ✓ DM incentive payments? (e.g. DMIS, complementing the Capital Expenditure Sharing Scheme – CESS and Efficiency Benefit Sharing Scheme – EBSS, and STPIS)
- × Smaller Regulatory Asset Base (RAB)
- × Lower return on investment
- × Lower revenue

Kangaroo Island DM/DE CASE STUDY:

- Population: 4300 Peak Demand 7.6 MW
- Undersea electricity supply cable nearing end of design life
- Replacement capital cable cost: ~$50 million
- Non-Network (DM) Alternative (**comparable cost,** but greater local benefit):
- Wind, Solar, Battery, Diesel, Biomass, Energy Efficiency, Peak Load Mgt

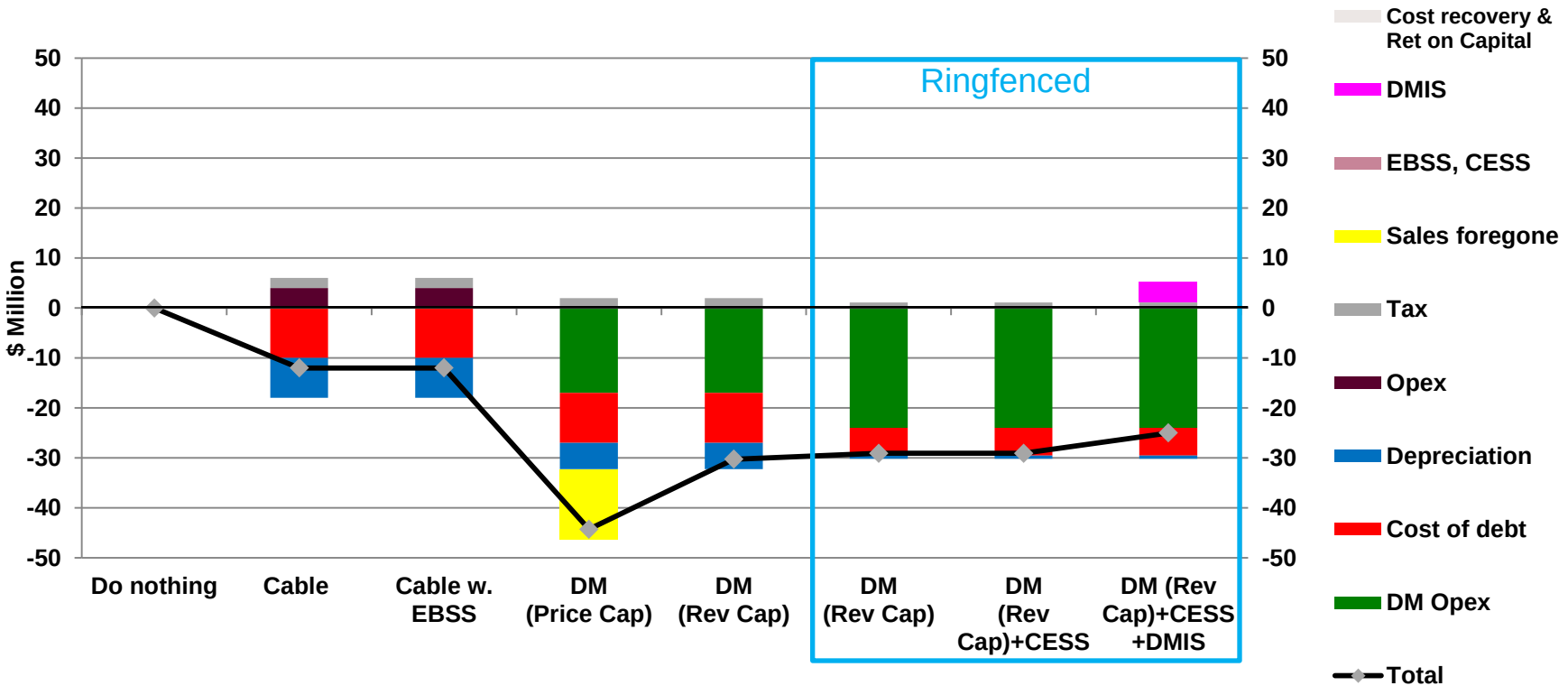
http://www.australia.com/content/australia/id_id/places/kangaroo-island/jcr:content/hero/image.adapt.1663.medium.jpg

INDICATIVE NON- NETWORK SOLUTION

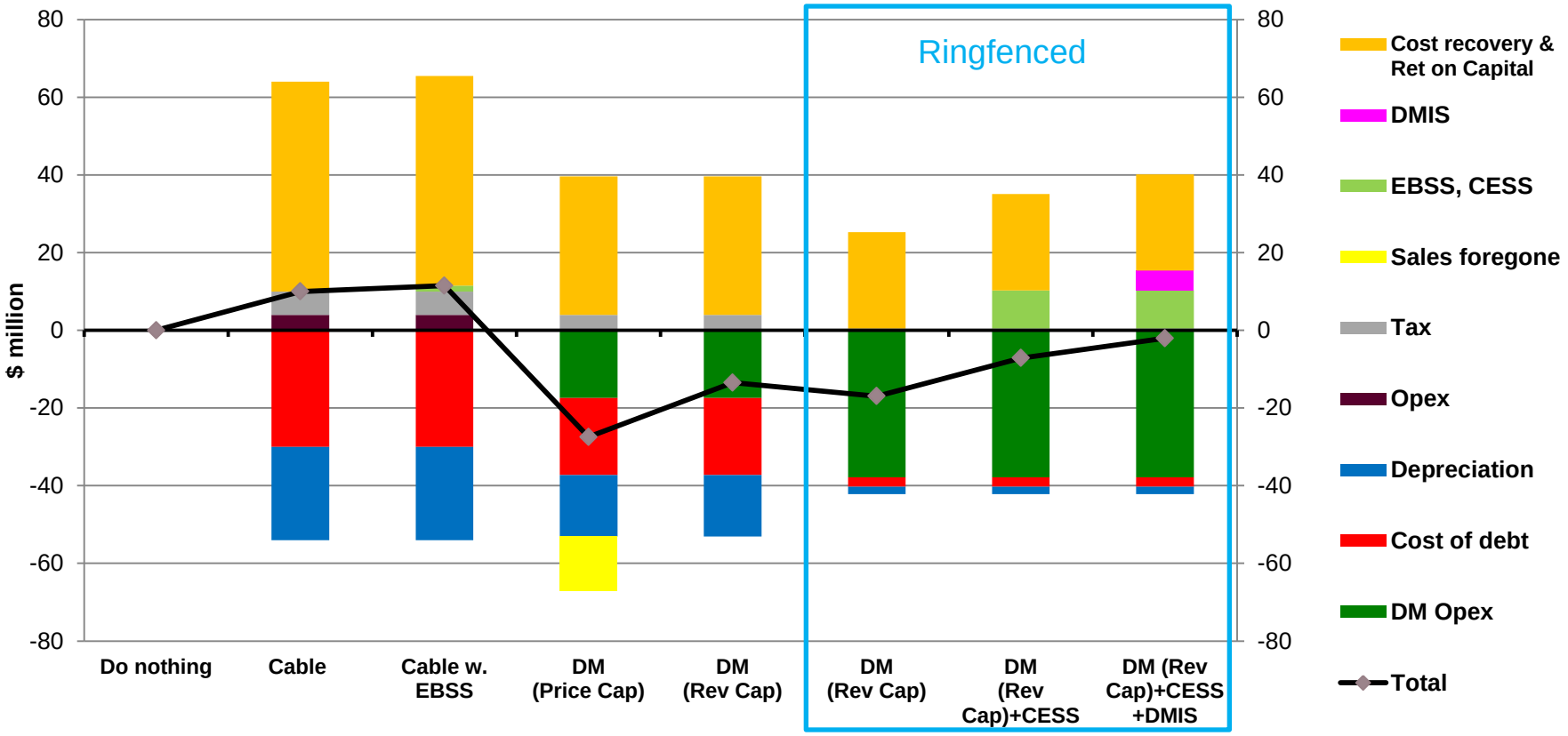
Illustrative option

- 8 MW wind turbines
- 4 MW centralised solar PV
- 4 MW rooftop PV (50% subsidy)
- 3 MW battery storage
  - ➢ co-located w solar PV- 70% subsidy
- 21% Energy Efficiency (subsidy @$50/MWh)
- 3MW Diesel Rotating UPS /Standby generation
  - ➢ 3% load factor

(*INDICATIVE*) NSP *SHORT TERM* FINANCIAL IMPACT (4 YEARS)



(*INDICATIVE*) NSP *LONG TERM* FINANCIAL IMPACT (12 YEARS)



WE NEED TO UNDERSTAND MUCH BETTER:

- **How current regulatory incentives impact on network businesses re DM.**
- **How NSPs perceive these incentives.**

- **Analysis needs to be comprehensive and quantitative, not just qualitative**
- **Analysis needs to be collaborative and empirical**

ISF, ENA and ARENA currently developing such a proposed:

"Stocktake of Network Regulatory Incentives for DM and DE"

2. BARRIERS TO DM

Regulatory barriers to technology (including to metering), market frameworks hindering entry, regulatory concerns, technical challenges for a smart grid, the business-as-usual preference for network solutions over DM.

Why previous attempts to encourage DM or demand response have failed, including issues with the AER's current DM incentive scheme.

- DMIS does not need to overcome every barrier, it is enough to outweigh them

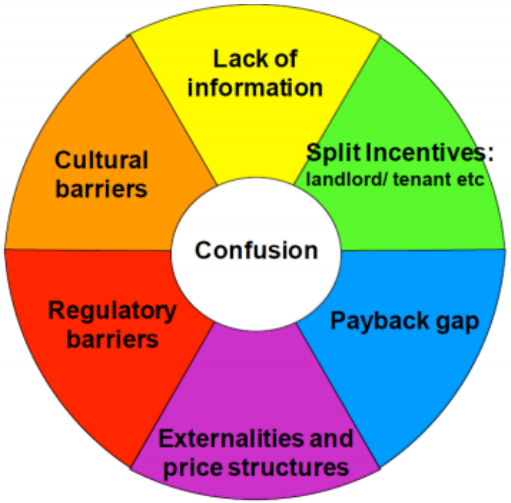
Survey of Stakeholder Perceptions

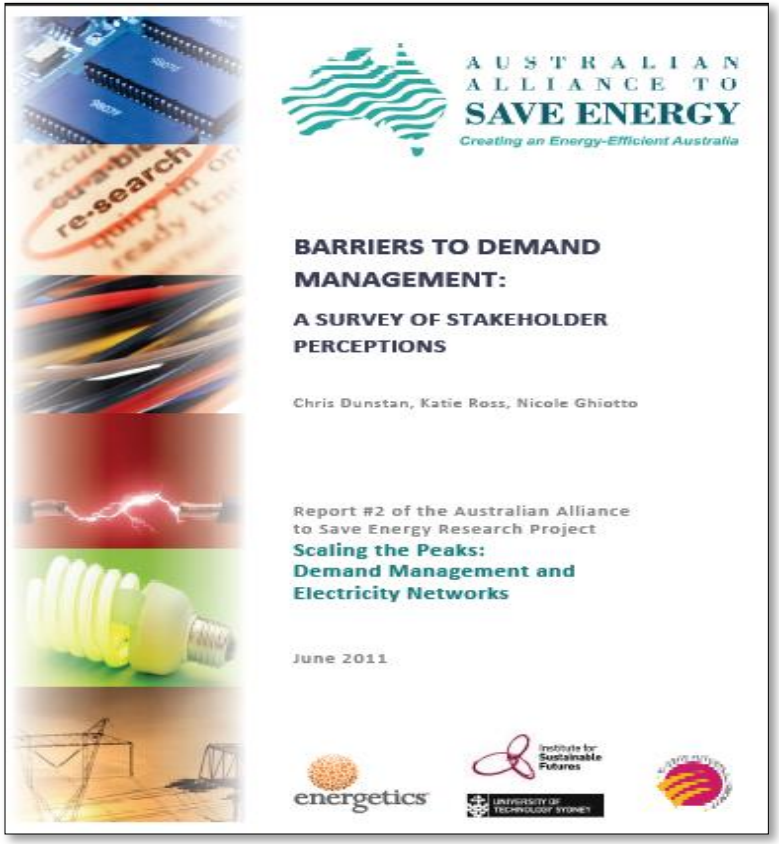
(2011)

- Which barriers are seen as most important?
- Do different stakeholder groups see barriers differently?

800 stakeholders;

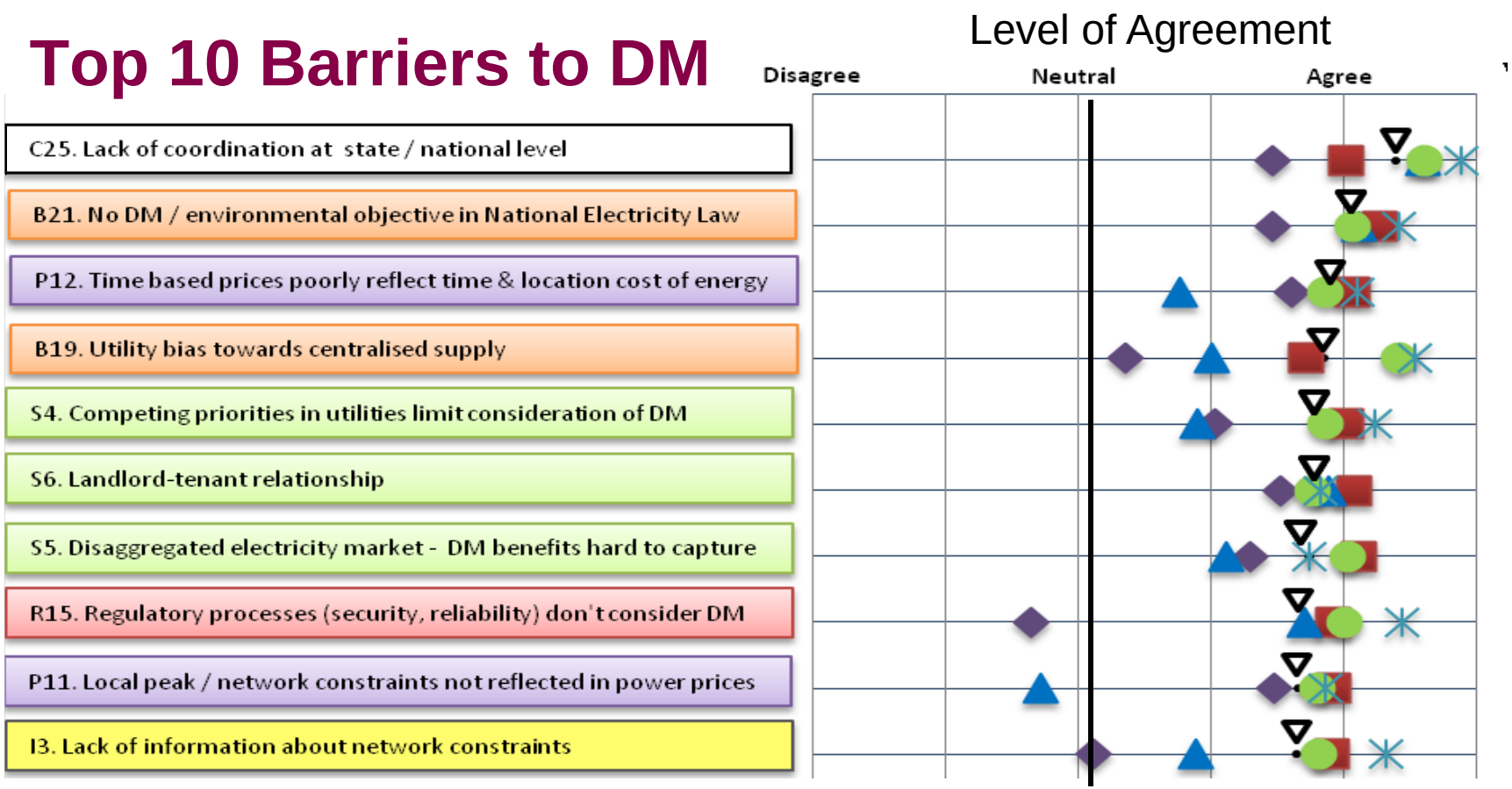
200 replies





http://a2se.org.au/images/stories/files/a2se_isf_dm_barriers_report.pdf

Top 10 Barriers to DM



3. INTERACTION WITH CONTESTABLE DM MARKET

- How can AER's DMIS and DMIA interact with ring-fencing.
- Encouraging networks to coordinated with third party DM providers.
- Opportunities to use the AER's DMIS and DMIA to promote competitive markets for DM, such as involving these in trials and tendering.

  - NSPs do not need to ***own*** DE in order to ***support*** or procure DE

    e.g. network support payments
  - But regulatory incentives for DM ***should be as attractive*** as owning DE, or network assets.

DMIS DESIGN ELEMENTS

4.CALCULATING COSTS AND BENEFITS & FUNDING MECHANISM DESIGN

Valuing total system savings of DM and all services that customers can deliver.

Fairly sharing system-wide benefits. Having a clear method to set an appropriate level of incentives so consumers benefit whilst maintaining returns to networks and allowing them to recover investment in DM.

- If NSPs could get financial returns on DM equivalent to returns on network investment, is this sufficient? (i.e. don't need share of other benefits?)
- Allow NSPs to undertake DM ***in advance*** of proposed network capex , e.g. allow NSPs to invest when value of DM exceeds expected value of unserved energy, instead of only on deferred network capex.
- System wide average vs local specific DM values?

5: SCOPE OF PROJECTS AND APPLICATION

Breadth/scope of the DMIS and DMIA; including types, length or focus of applicable projects.

How to fairly exercise its discretion in applying the DMIS and DMIA . Criteria-based application: e.g based on project's value proposition, marketability, or outputs.

Determining the size of innovation allowance mechanism: capped or uncapped, subject to application/approval.

- Keep it simple: Outcome-focussed, performance-based
- Do we need a DMIA if we have an effective DMIS?

6: DM PERFORMANCE DATA, REPORTING & VERIFICATION

- Project reporting, monitoring, verifying and enforcing results.
- Knowledge sharing, research collaboration, reducing duplicative trials.
- Availability of meaningful data, transparency of DM projects.

  - Consistent, standardised, regular performance reporting, e.g.
    - Savings from DM (MW_{peak}, MWh p.a., t CO2, customers savings $)
    - Annual and total cost and value of avoided network costs
    - Unit costs. ($/MWh, $/kVA/year)
  - Coordinated, consolidated, accessible NEM-wide reporting and info sharing
  - Case studies

Primavera by Sandro Botticelli (circa 1480)
(for Lorenzo di Pierfrancesco de' Medici)

Those who …. acquire a principality with difficulty … keep it with ease…. And … there is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things. Because the innovator has for enemies all those who have done well under the old conditions, and lukewarm defenders in those who may do well under the new.

- Niccolo Machiavelli, The Prince ~1513

THANK YOU

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