

# Electricity Demand Management: Correcting Australia's Energy Blindspot

AIE Sydney Branch Evening Presentation  
Monday 20 April, 2015

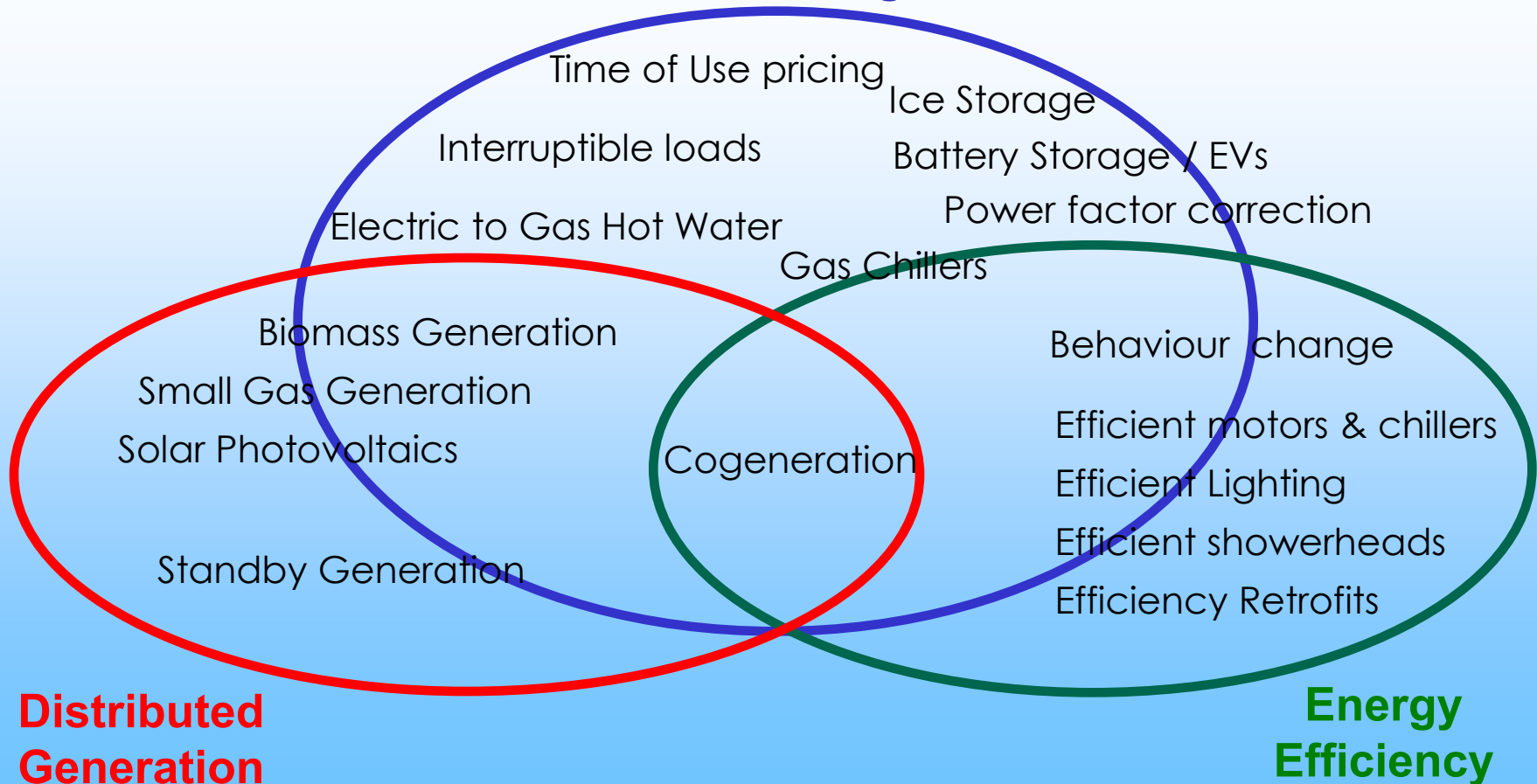


**Chris Dunstan,**  
Research Director  
Institute for Sustainable Futures, UTS

# What is Demand Management (DM)?

*Reducing or shifting demand, **as an alternative to** providing more supply capacity to meet demand*

## Peak Load Management



## The National Electricity Objective (NEO):

"to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to—

(a) price, quality, safety, reliability and security of supply of electricity; and

(b) the reliability, safety and security of the national electricity system”

**n.b. no reference to:**

customer bills, cost, equity, risk, sustainability, competition or demand management

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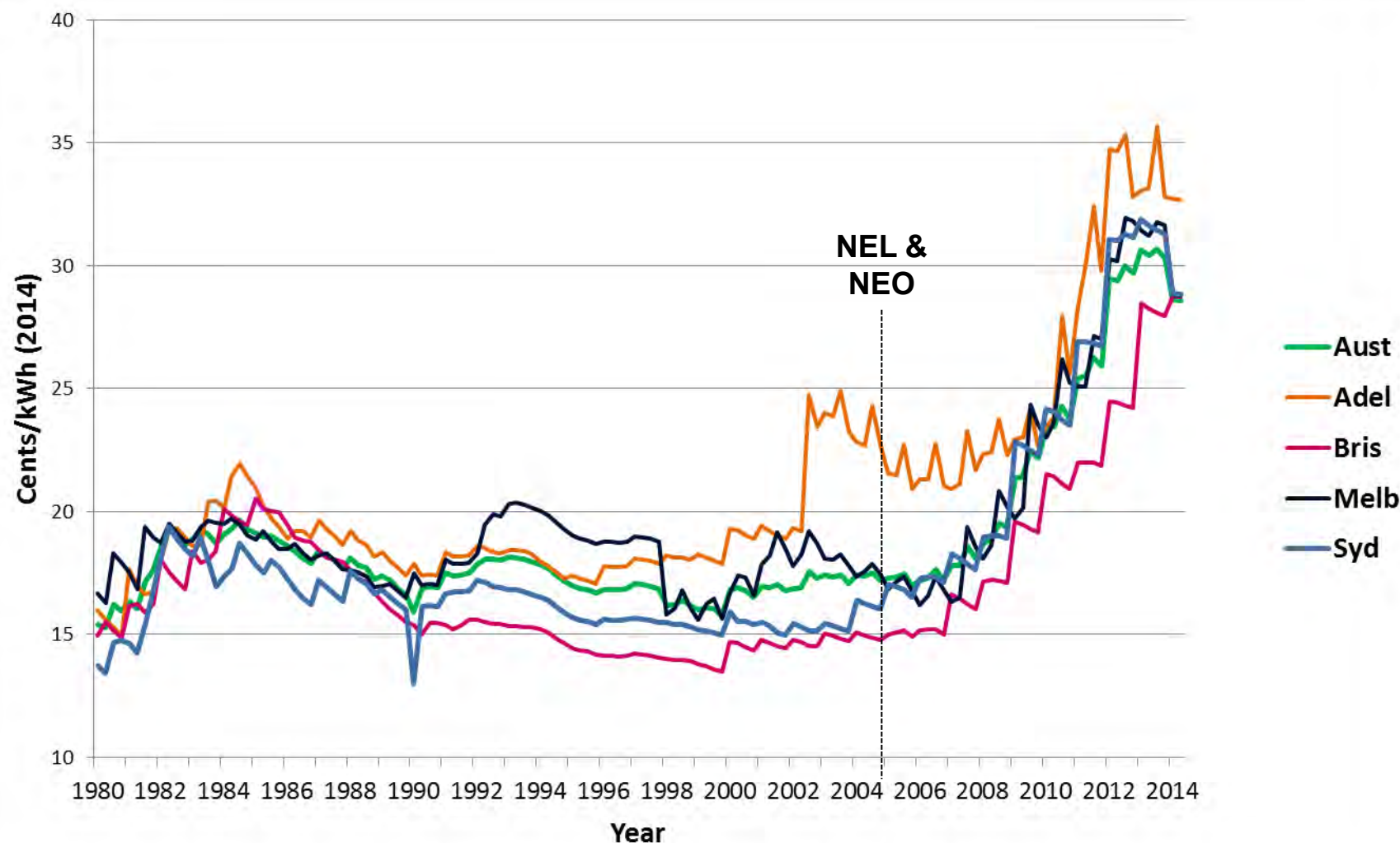
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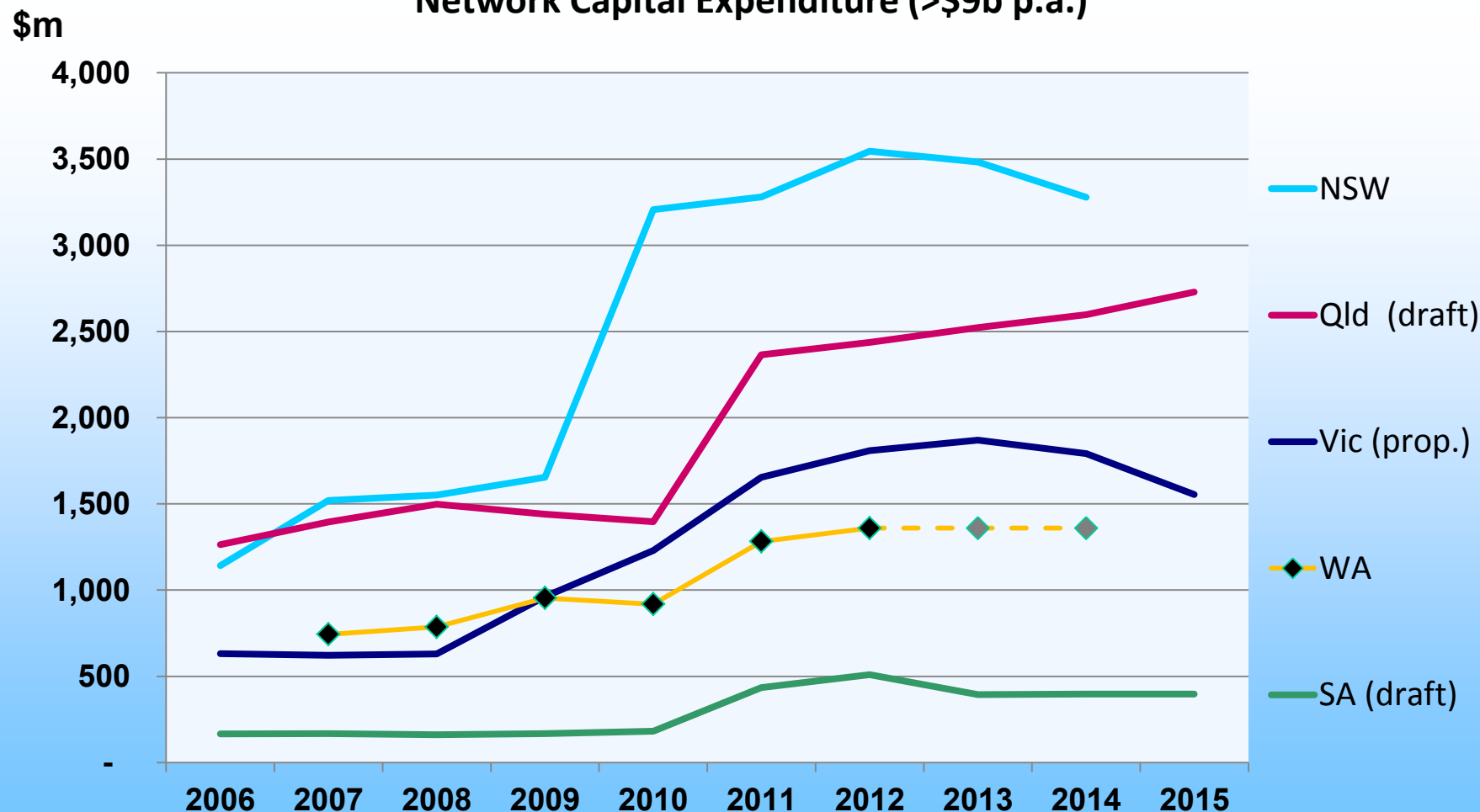
## Real Residential Electricity Prices excl. GST (1980-2014)





# Network Investment: >\$45 Billion (2010- 2015) (more than National Broadband Network)

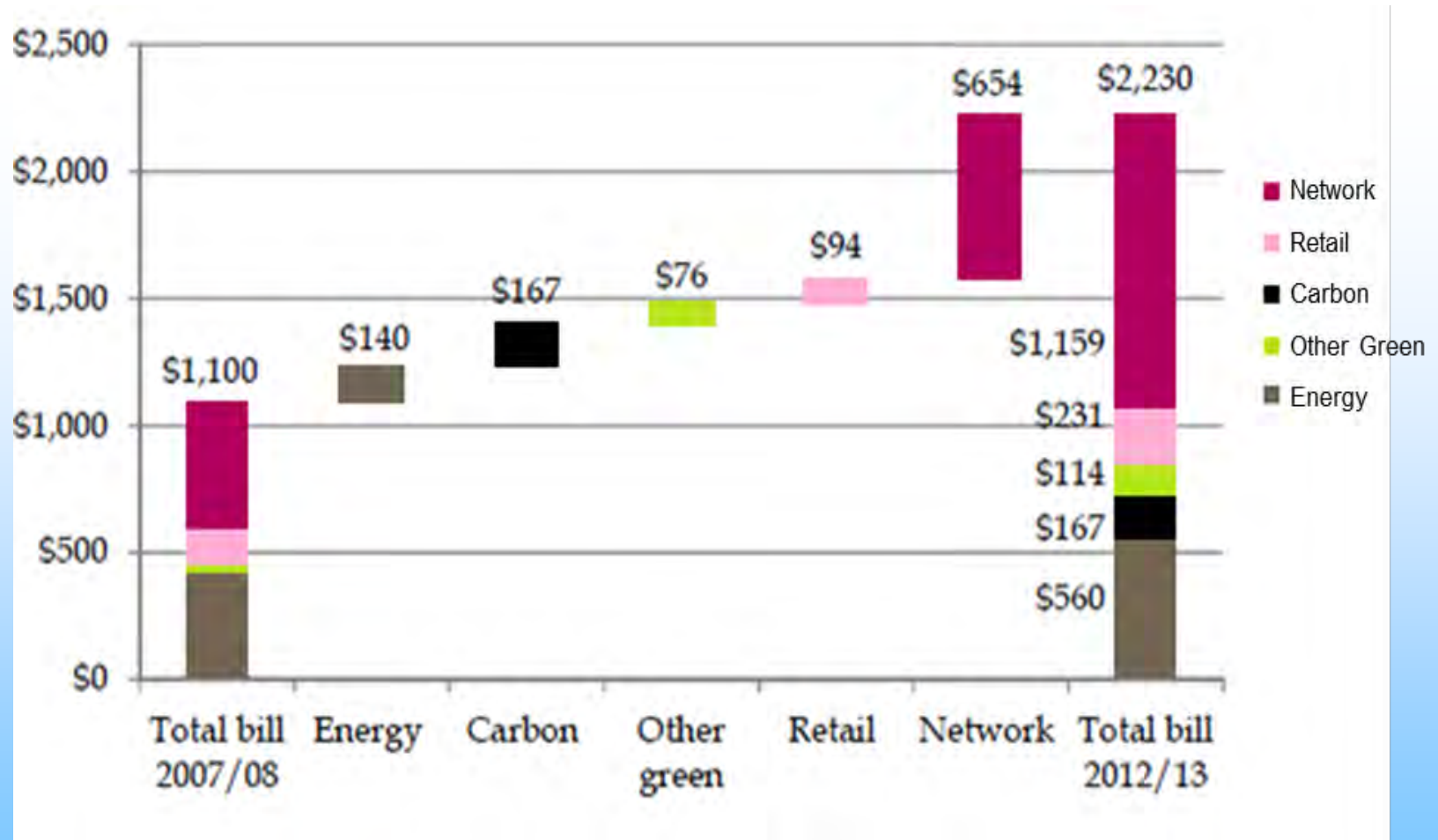
## Network Capital Expenditure (>\$9b p.a.)





# Components of electricity price rises in NSW

2007/08 - 2012/13







## We were warned...

*“It is the Tribunal’s strong view that there is significant untapped potential for efficient demand management. To a large extent, one of the major obstacles continues to be a culture which favours traditional 'build' engineering solutions and which pays little more than lip service to alternative options.*

*The Tribunal is very concerned about the potential for substantial increases in capital expenditure and worsening asset utilisation, with adverse consequences for costs faced by end-users. ...*

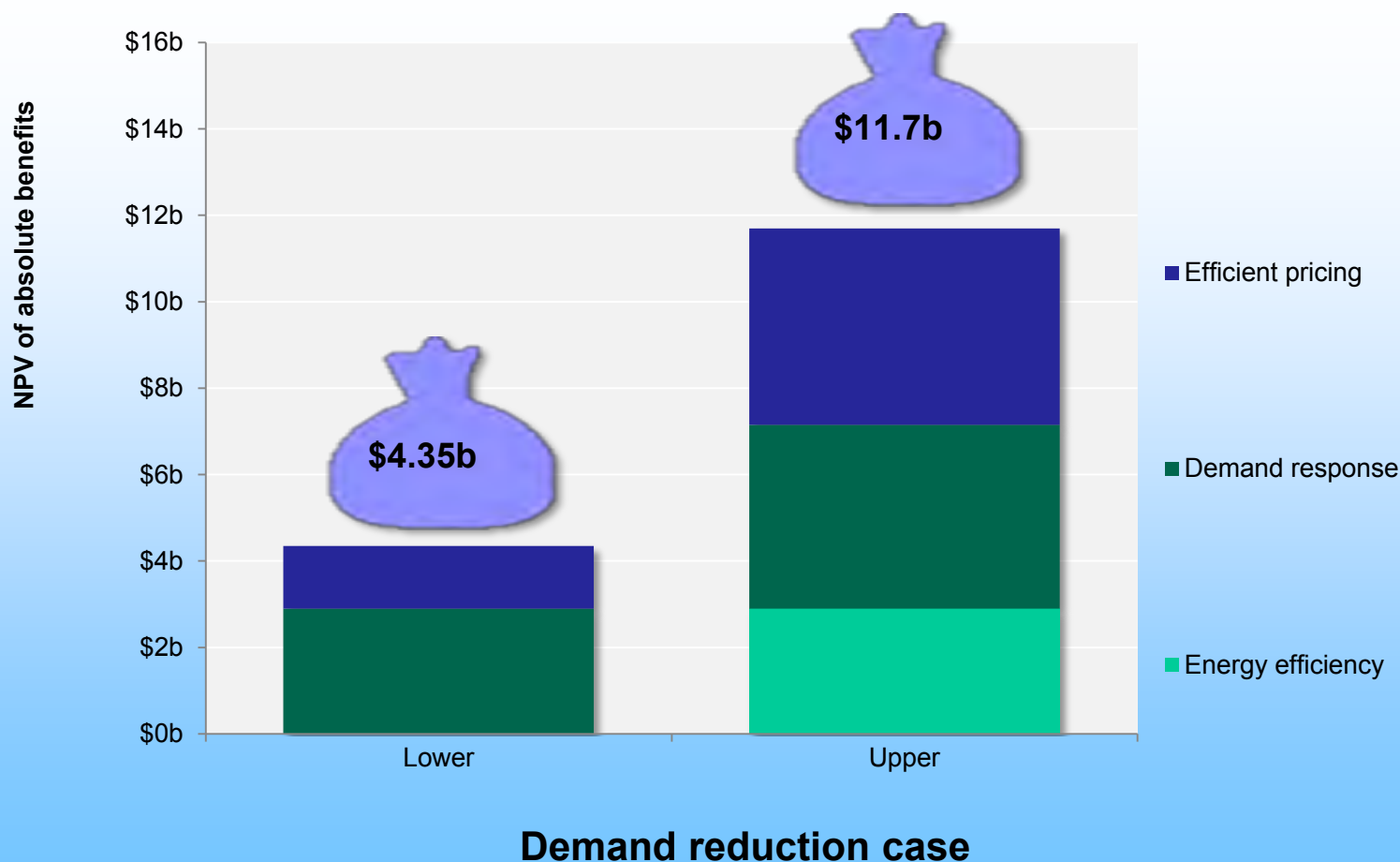
*Potentially massive increases in network expenditure to meet demand growth highlight the importance of getting demand management right.”*

**- Prof Tom Parry, NSW Independent Pricing and Regulatory Tribunal  
Inquiry into Demand Management, 2002**



## 10 years later: the DM Opportunity

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



# Magnetic Island Solar City Project

2007: Rapidly rising demand

Leading imminent need for a 3rd undersea cable (\$18 million)

Invested in efficient lights, energy audits, 200 solar PV systems, 1500 smart meters, etc

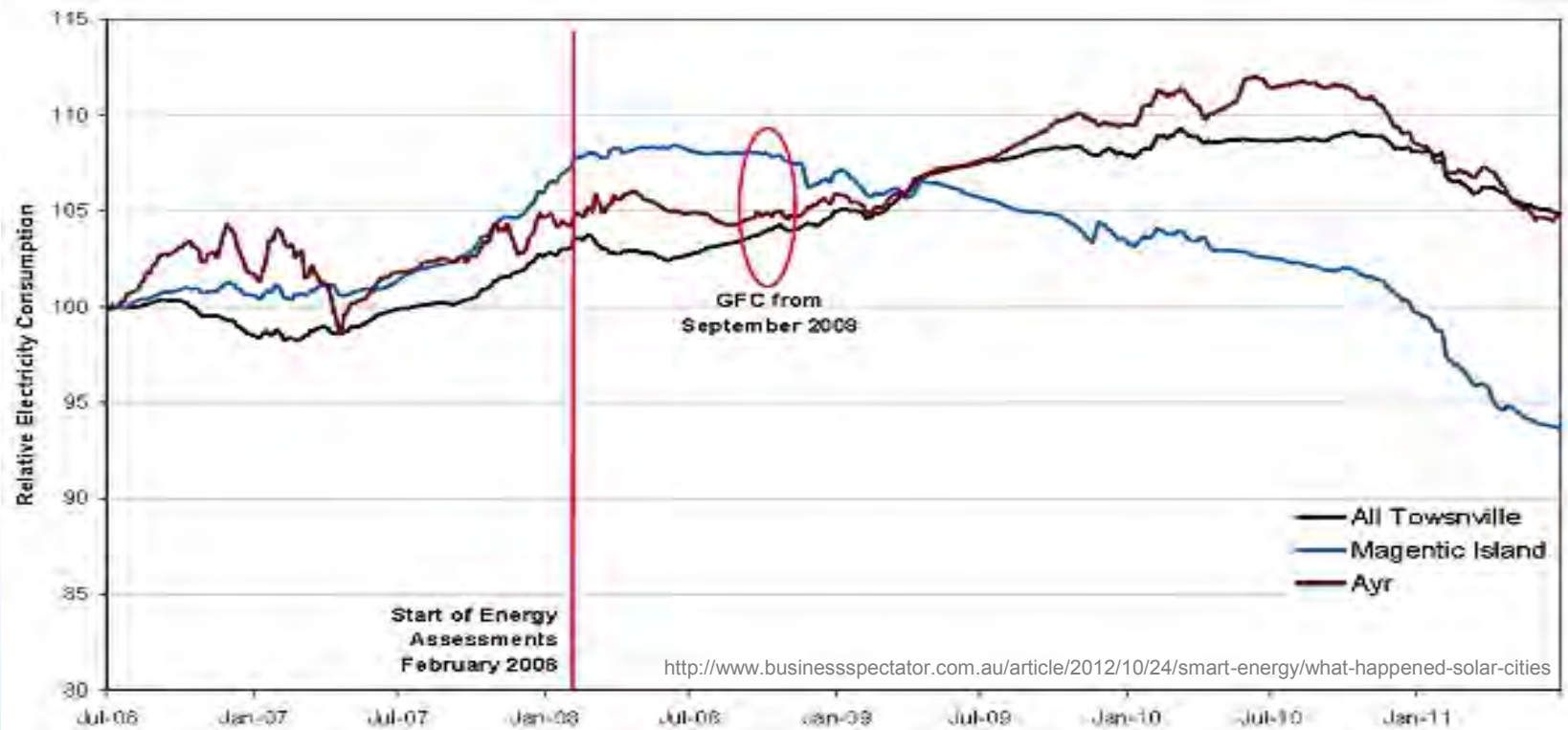
Cut peak demand 44% below BAU  
Cut energy by 40% below BAU

Deferred new investment  $\geq 8$  years

Budget: \$30 million  
(n.b. demonstration project)



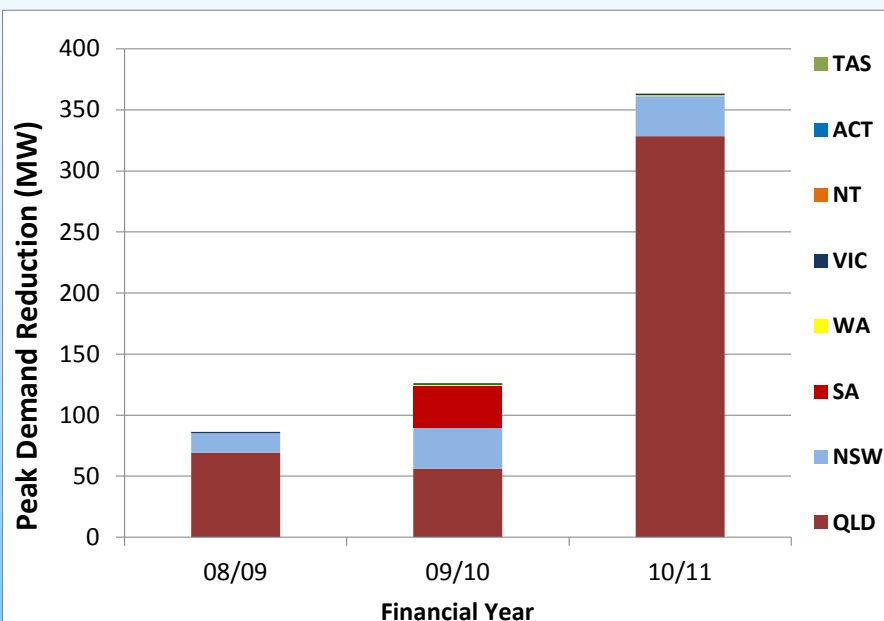




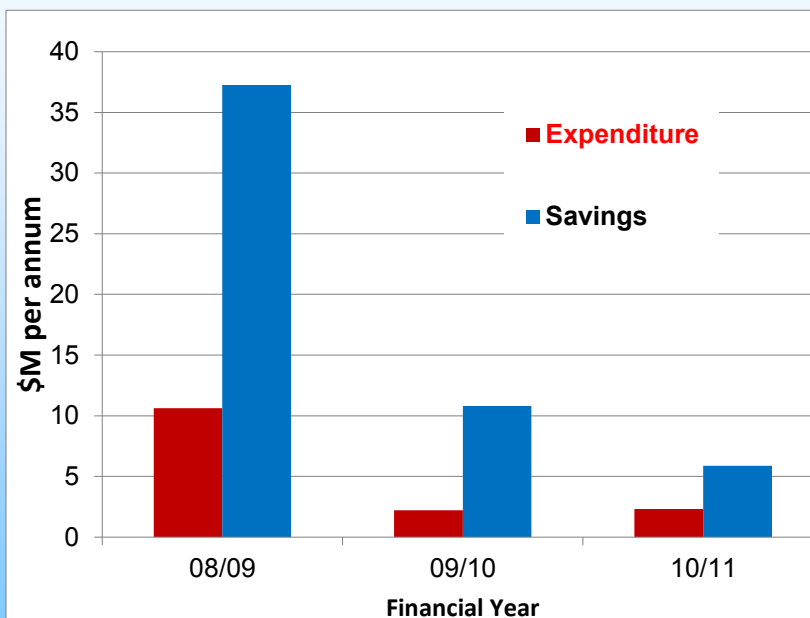


# Survey of Network Demand Management (ISF- 2011)

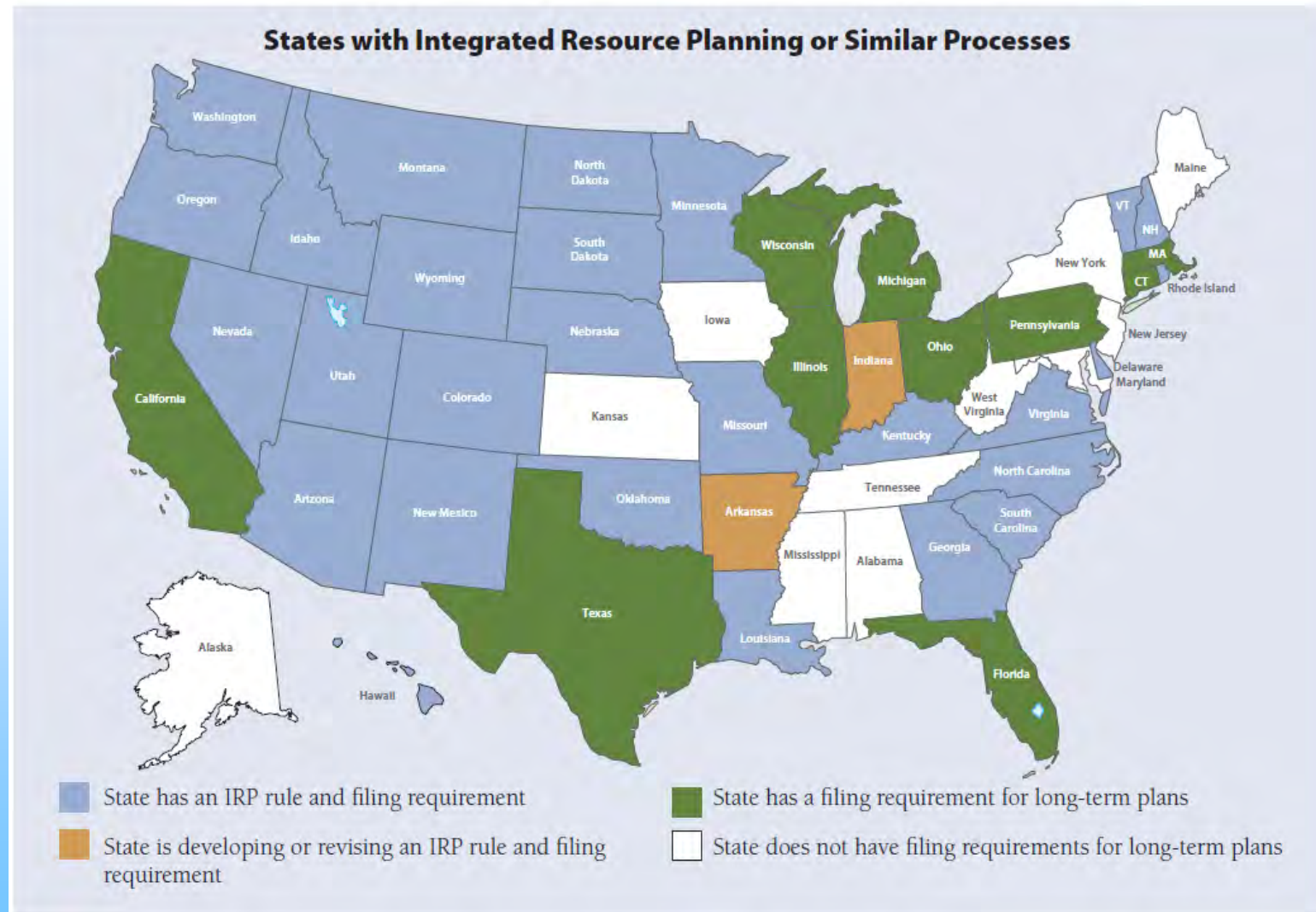
## Demand Reduction by state



## Expenditure vs savings



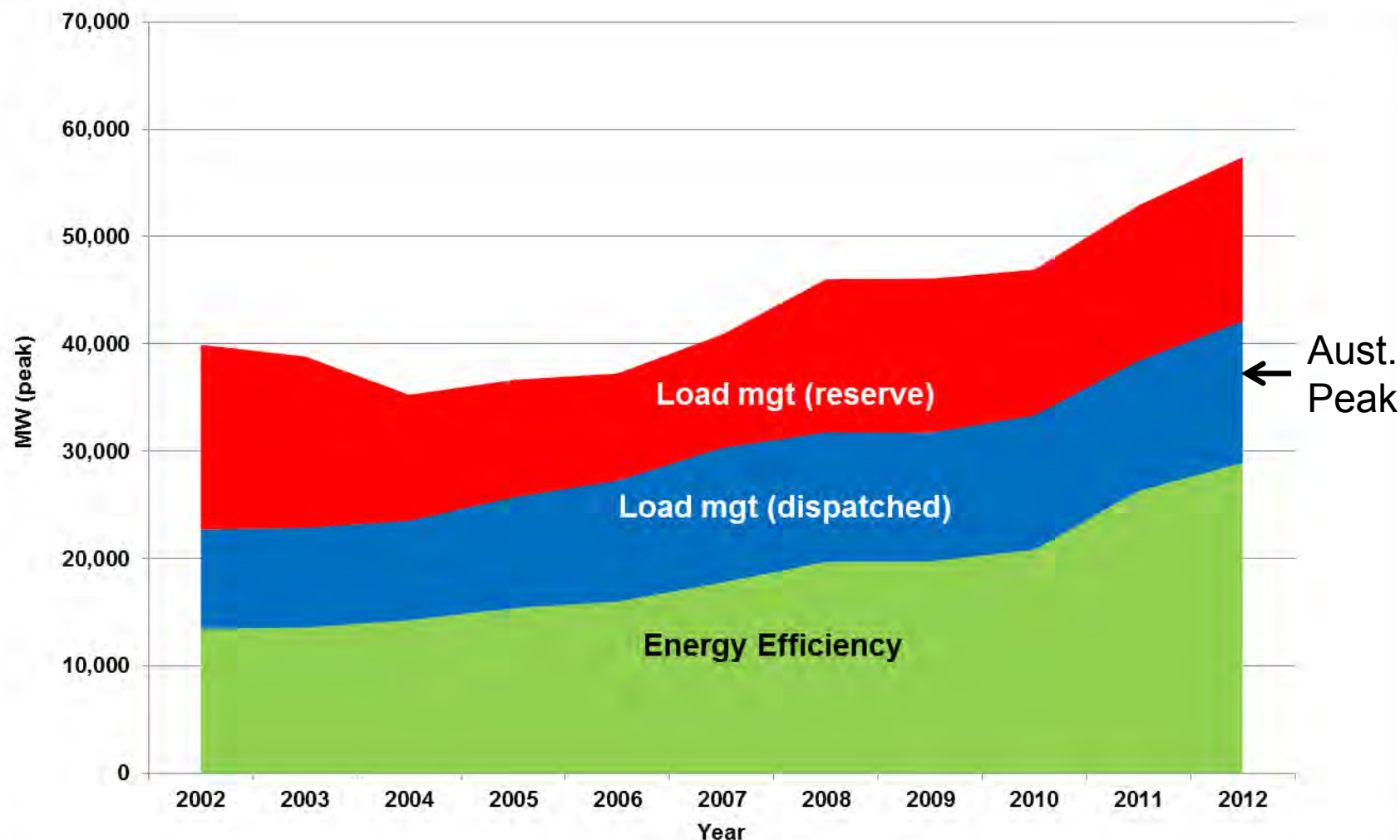
# US States with DM objectives





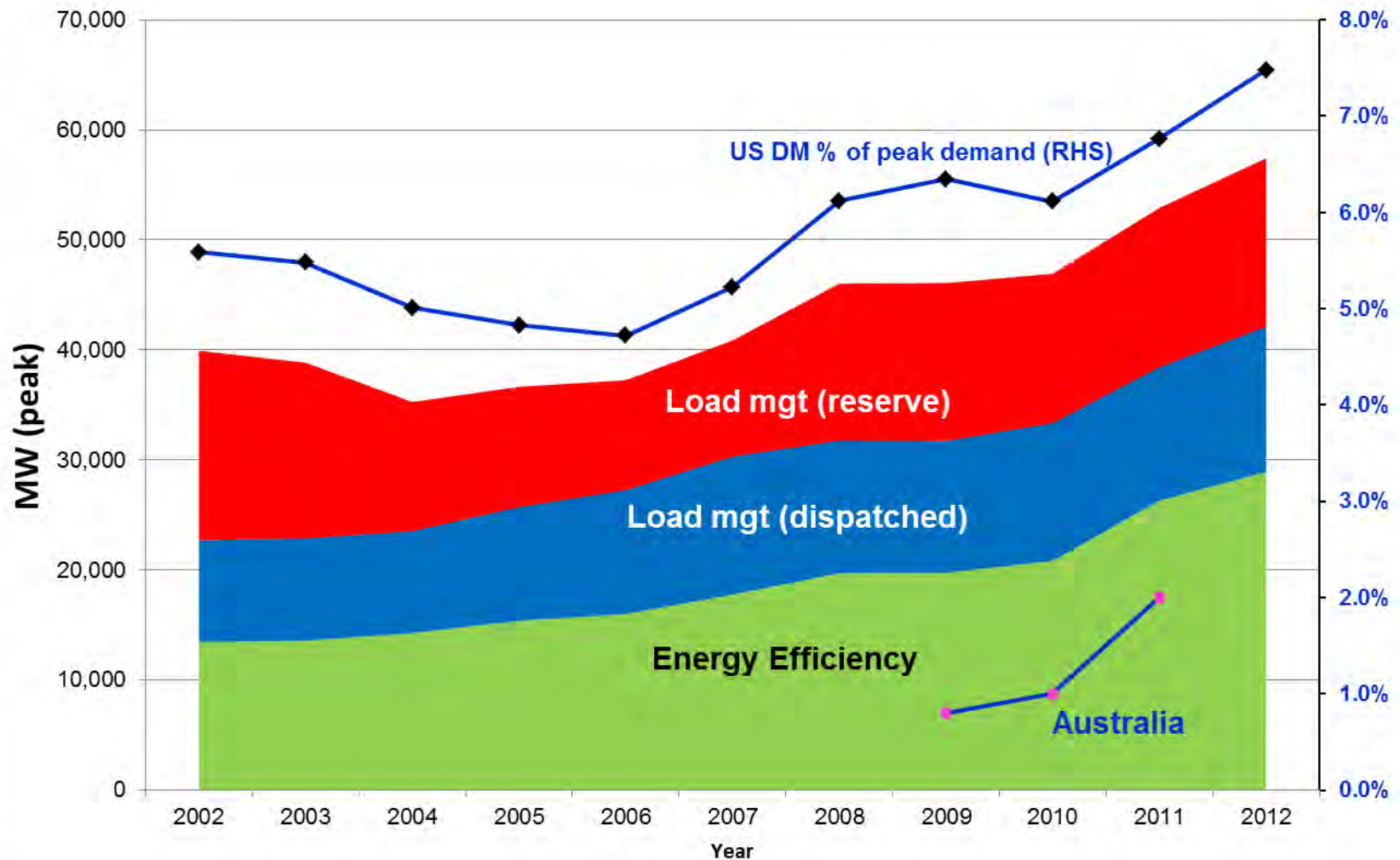


## Utility DM in US: Outcomes



Source: US Energy Information Administration

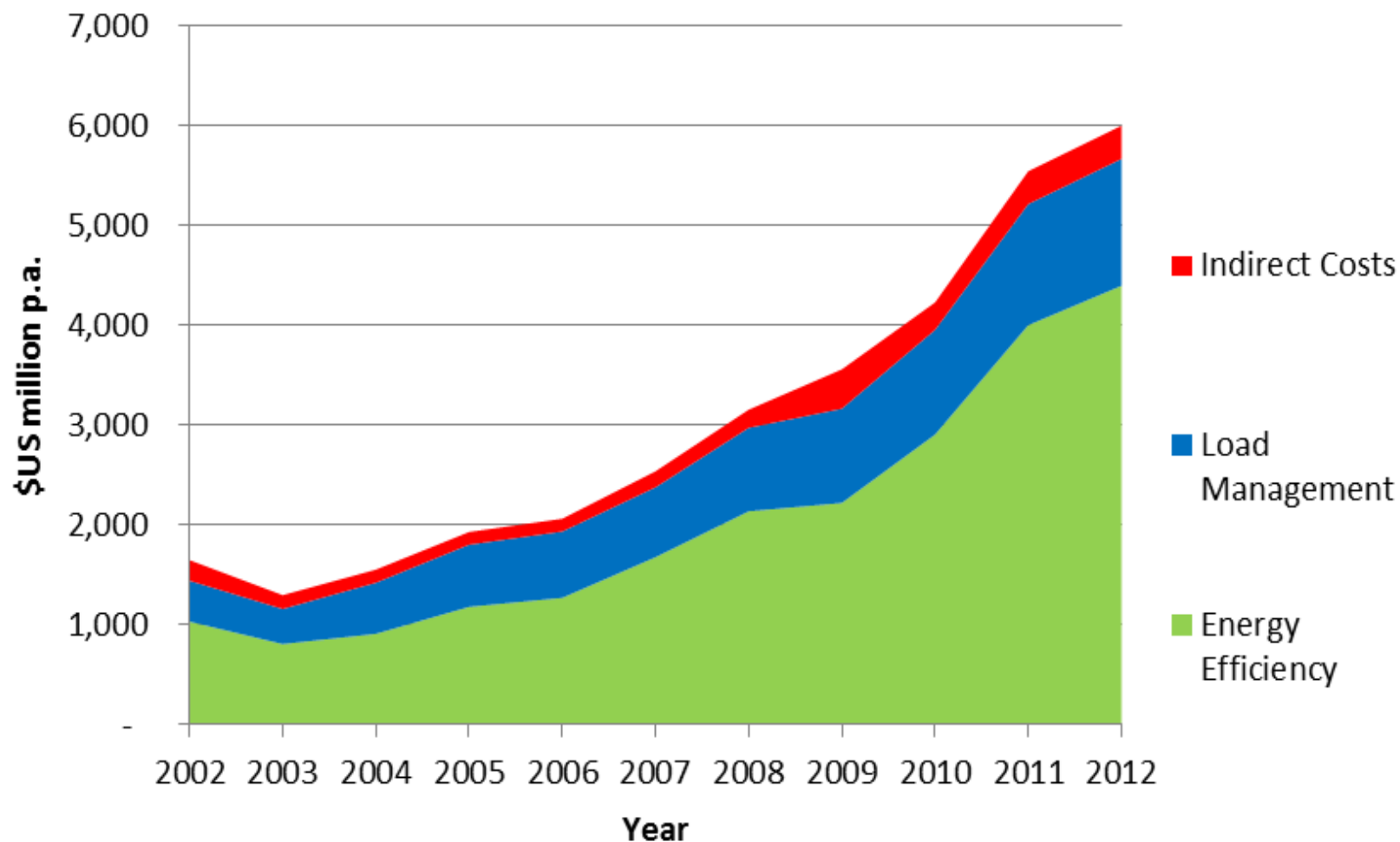
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Source: US Energy Information Administration, ISF

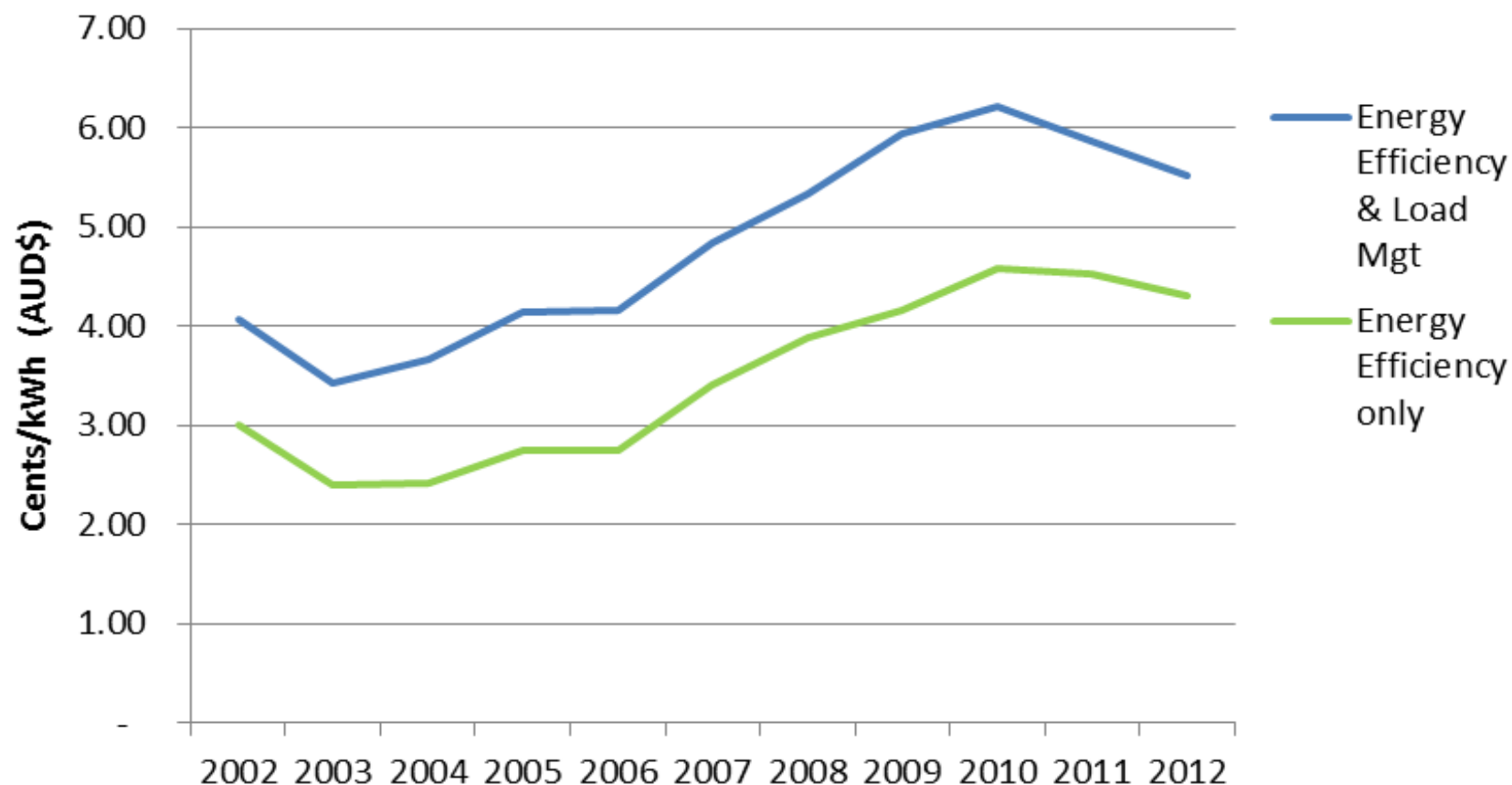


## Utility DM in US: Expenditure





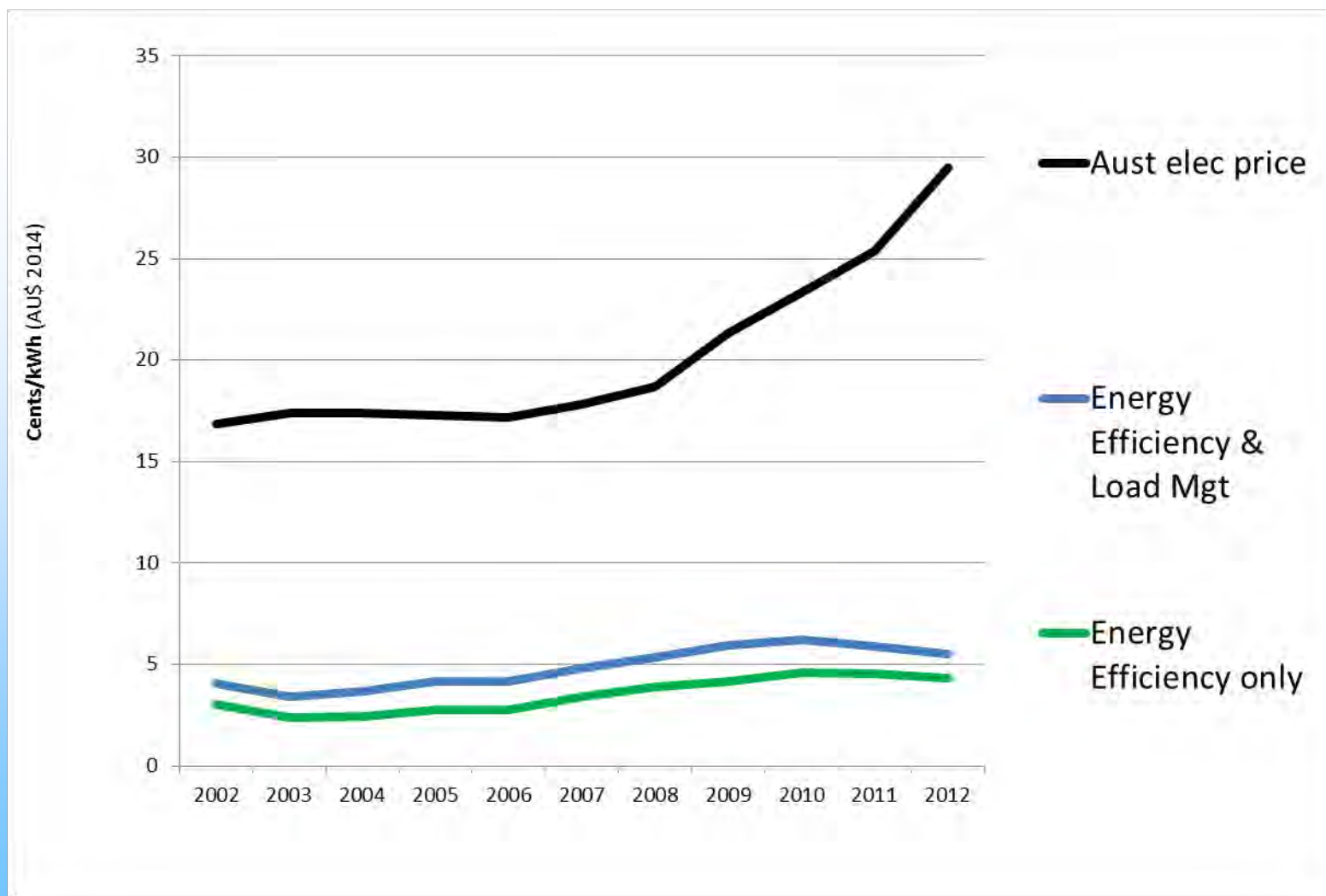
## Cost of US Utility DM



Source: US Energy Information Administration



## Cost of US Utility DM vs Aust Electricity price



Source: US Energy Information Administration, ABS, AEMC



# Why does cost effective DM does not happen?

*(abridged version)*

1. Network business (generally) earn a financial return on network supply investment.
2. Network business (generally) are financially penalised if they undertake DM.
3. 'Twas ever thus.  
*(i.e. force of habit)*
4. The unabridged version will make you wish you were here...  
*(i.e. it's complicated)*







## What AEMC said re DM:

“The current arrangements already ... allow the AER to ... apply [an] incentive scheme for demand management, [to provide] an incentive for distributors to implement efficient non-network alternatives ... However to date, this scheme has been applied in a very limited manner...”

“To address this, we are recommending that a more comprehensive demand management incentive scheme ... implemented through a rule change ...”

“Overall the change will provide more opportunity and certainty for networks to pursue [DM] projects which deliver savings to consumers...”





# Demand Management Incentive Scheme

1. AER should give network businesses *CLEAR* incentives to invest in DM, wherever it reduces consumers costs.
2. Support DM **targets** for network businesses.
3. Ensure consistent DM performance **reporting** by network businesses.

Proposed National  
Electricity Rule change:

<http://www.aemc.gov.au/Rule-Changes/Demand-Management-Incentive-Scheme>



# The future?

(It's not just about cost savings)



# Wild Card 1: Solar PV

Australian PV installations since April 2001: total capacity (kW)





# Wild Card 2: **Electric Vehicles**

## **The Mitsubishi i-MiEV**



(16kWh of batteries +  
150 km range)

## **(Chevy) Holden Volt**



(17kWh of batteries +  
54 kW electric generator)

Tesla  
Model S  
(85 kWh)

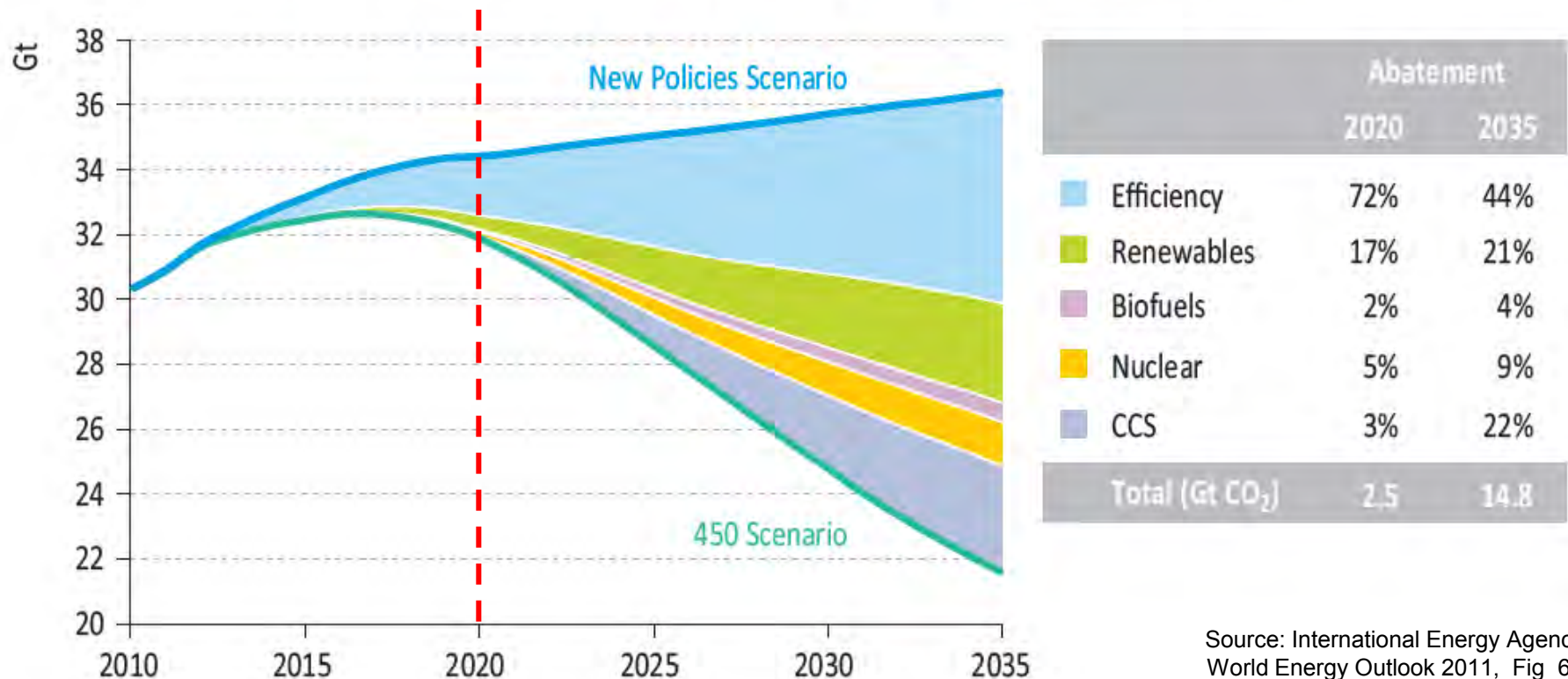


Q. How many Volts = Australia's  
total peak electricity demand?  
A. ~800,000 (= 6% of the fleet)

# Wild Card 3: Energy Efficiency

## the cheapest way to cut carbon emissions

World energy-related CO<sub>2</sub> emissions abatement in the 450 Scenario relative to the New Policies Scenario



Source: International Energy Agency, World Energy Outlook 2011, Fig 6.4





# Wild Card 4:

## Empowering consumers with data

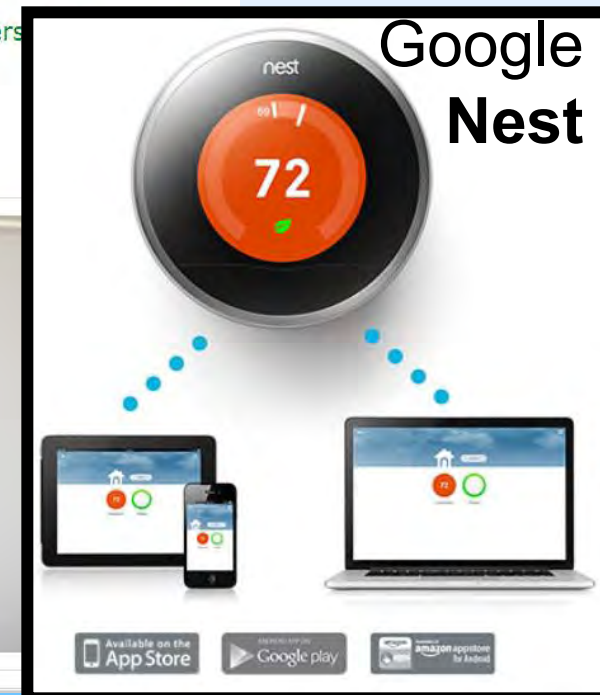


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providing affordable, timely  
access to energy usage data

The common-sense idea that electricity customers should be able to securely download their own detailed household or building energy usage information from their utility website. Join the effort to give all Americans the access to their own energy usage information.

[Learn More »](#)



## Wild Card 5: Climate policy



Ban Ki-moon, UN Secretary-General,  
23 Sept 2014

<http://www.theguardian.com/environment/blog/live/2014/sep/23/un-climate-change-summit-in-new-york-live-coverage#block-54216343e4b020a19dddfbf>

“We must cut emissions. Science says they must peak by 2020 and decline sharply thereafter. By the end of this century we must be carbon neutral.”

NASA GISS Global Temperature Anomaly  
12-month Running Mean

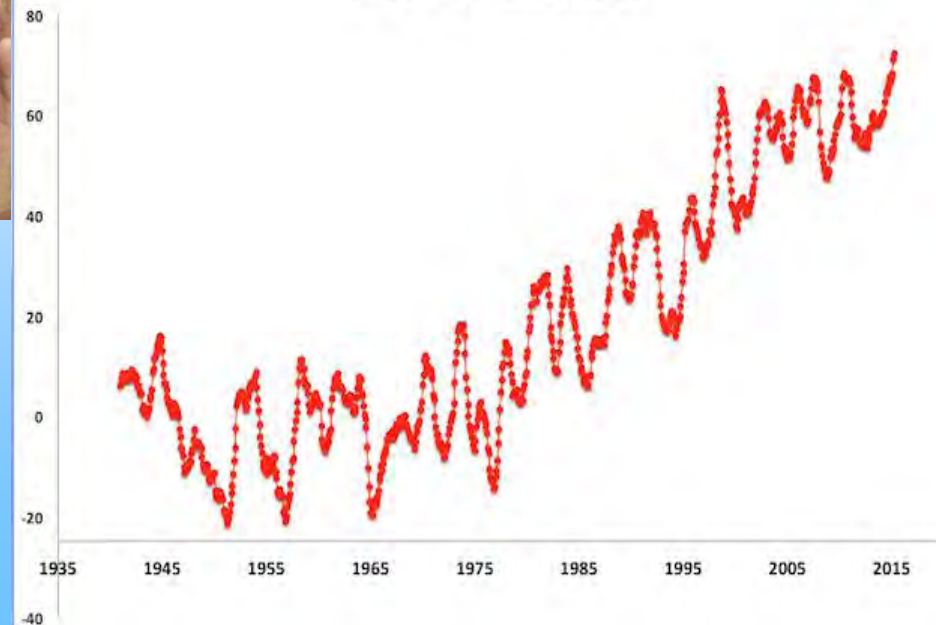
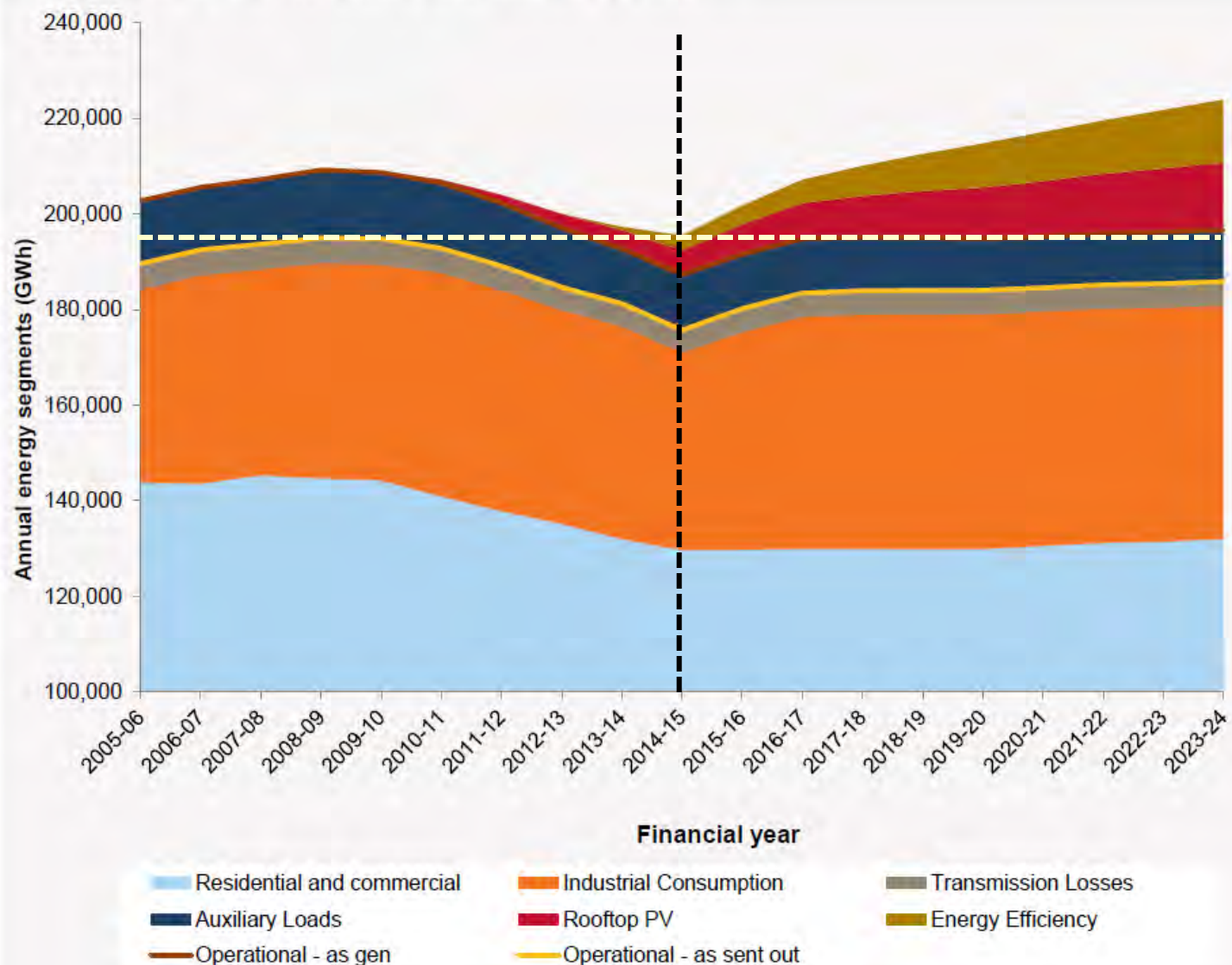






Figure 5 — Annual energy forecasts segments for the NEM





# The “energy death spiral” does not need grid defection



## Two dates to watch:

### **30 April: AER releases:**

- > Final determination for NSW network businesses (2015-19)
- > Draft determination for Qld network businesses (2016-20)

*Will AER support networks' DM proposals?*

### **28 May: AEMC releases draft DMIS Rule Change decision**

*Will AEMC require AER to establish an effective DM incentive scheme?*

**Our network businesses are saying,  
very clearly,  
they want to be able to support DM...**

"to promote efficient investment in,  
and efficient operation and use of, electricity services  
for the long term interests of consumers of electricity..."

**Let's hope they are given a chance to do so.**



# Thank you

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