



# **The Future for Renewable Energy in NSW**

**Presentation for AIE Seminar - Electricity Supply in NSW**

22 September 2014

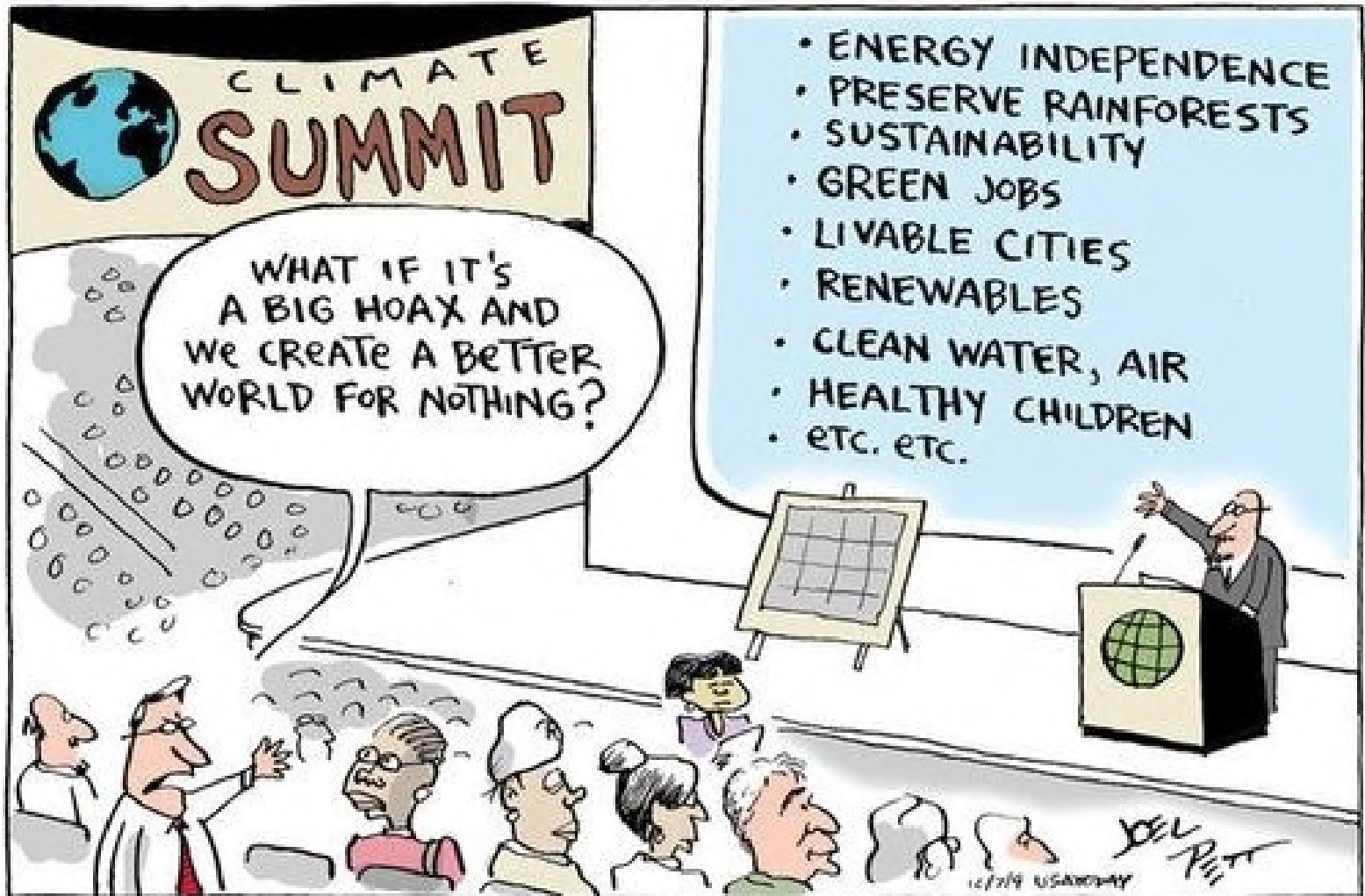
# Agenda

- Infigen Energy Overview
- Renewable Energy in SA
- What did we learn from the Warburton Review?
- The Future for Renewables in NSW

**Presenter:**

Jonathan Upson

Senior Development & Government Affairs Manager

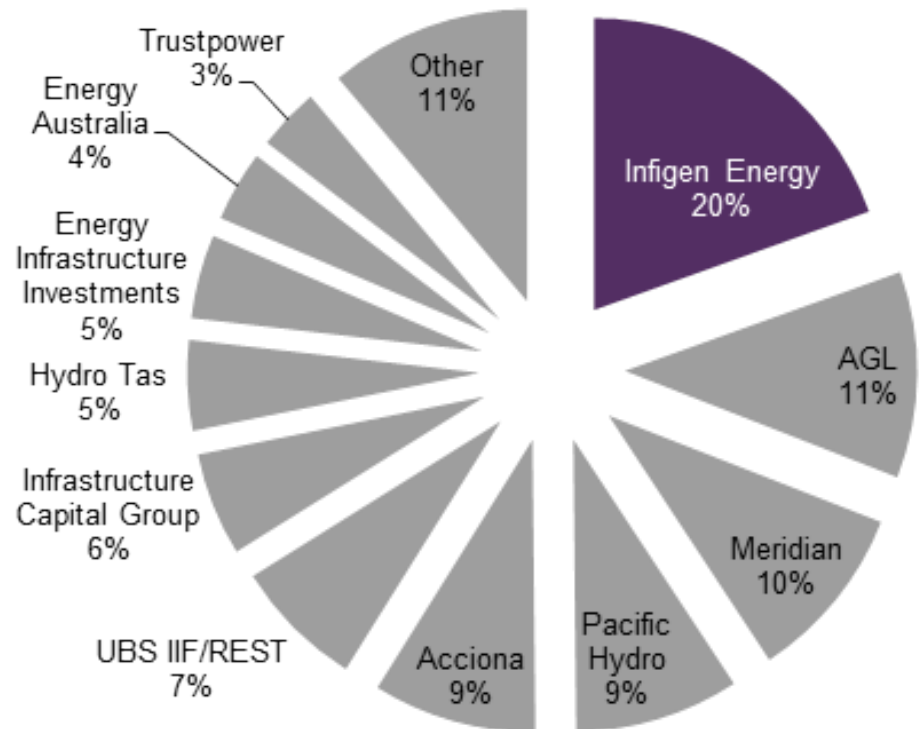


# Infigen Energy Overview

An established renewable energy developer and owner-operator in Australia and the US

- Sydney HQ; ASX listed (ASX:IFN)
- Operate over 1,600 MW of wind energy generation
- Own and operate > 1 GW wind energy business in the United States
- Largest owner of installed wind energy capacity in Australia and licensed retailer of electricity
- Active developer of utility-scale solar PV in Australia and the US
- Solar PV and energy storage demonstration plant under construction at Bungendore, NSW
- Substantial and advanced renewable energy project development pipeline

% Installed Capacity – Australia<sup>1</sup>



1. AEMO (2012) and company websites.

# Major Australian Assets

Australia's leading specialist renewable energy developer, owner and operator

## ALINTA, WA

Installed Capacity **89.1MW**  
Capacity Factor **44%**  
Completed **Jan 06**



## LAKE BONNEY, SA

### LB1

Installed Capacity **80.5MW**  
Capacity Factor **28%**  
Completed **Mar 05**

### LB2

Installed Capacity **159.0MW**  
Capacity Factor **30%**  
Completed **Sep 08**

### LB3

Installed Capacity **39.0MW**  
Capacity Factor **31%**  
Completed **Jun 10**



## WOODLAWN, NSW

Installed Capacity **48.3MW**  
Capacity Factor **39%**  
Completed **Oct 11**



## CAPITAL, NSW

Installed Capacity **140.7MW**  
Capacity Factor **36%**  
Completed **Nov 09**



# Calling all runners...

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## ***RUN WITH THE WIND*** ***Sunday, 26 October 2014***

***Fun run at the  
Woodlawn wind farm  
10km and 5km courses  
Kids under 12 run free***

***Register at  
[runwiththewind.com.au](http://runwiththewind.com.au)***

***Contact us at  
[info@runwiththewind.com.au](mailto:info@runwiththewind.com.au)***

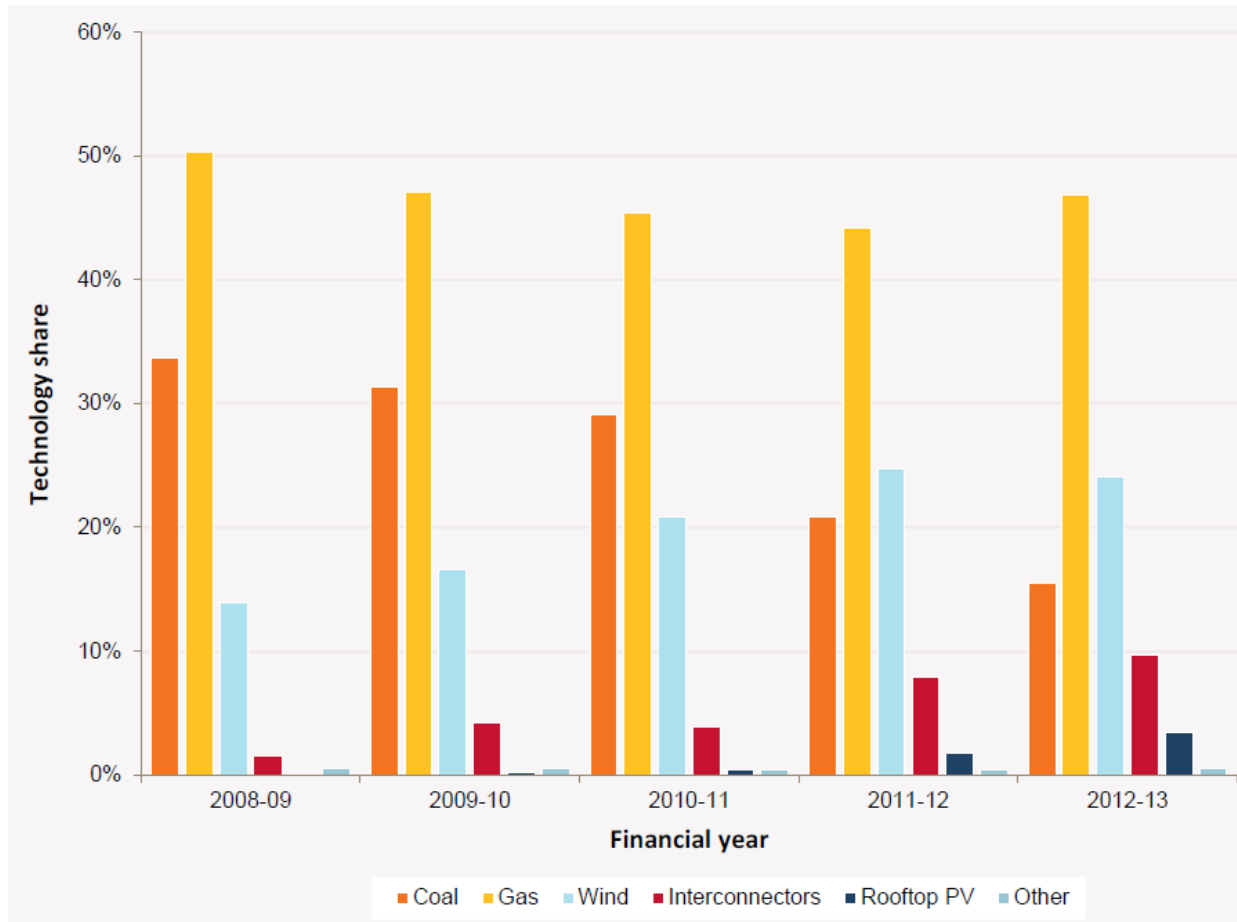
RUN WITH THE WIND IS PROUDLY SPONSORED BY INFIGEN ENERGY

Find Infigen's photos and social communities on  
Flickr, Facebook, Instagram and Twitter

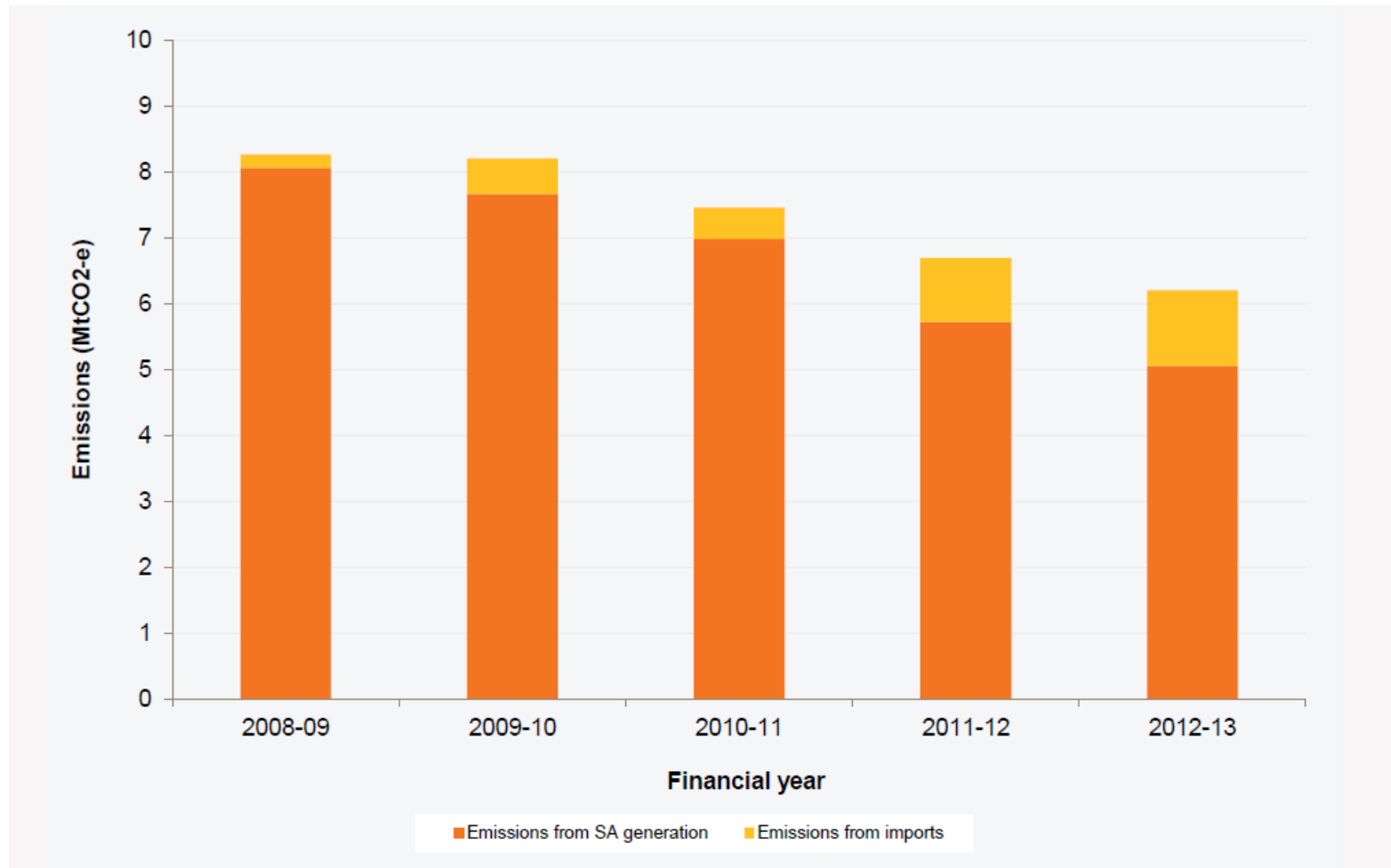


**3<sup>rd</sup> Annual  
Run with the Wind**  
About 2 ½ hours from Sydney  
and 45 minutes from Canberra

# Wind is generating 27% of SA's electricity ...and is far ahead of coal as the #2 generating technology



# Resulting in a 25% reduction in greenhouse emissions

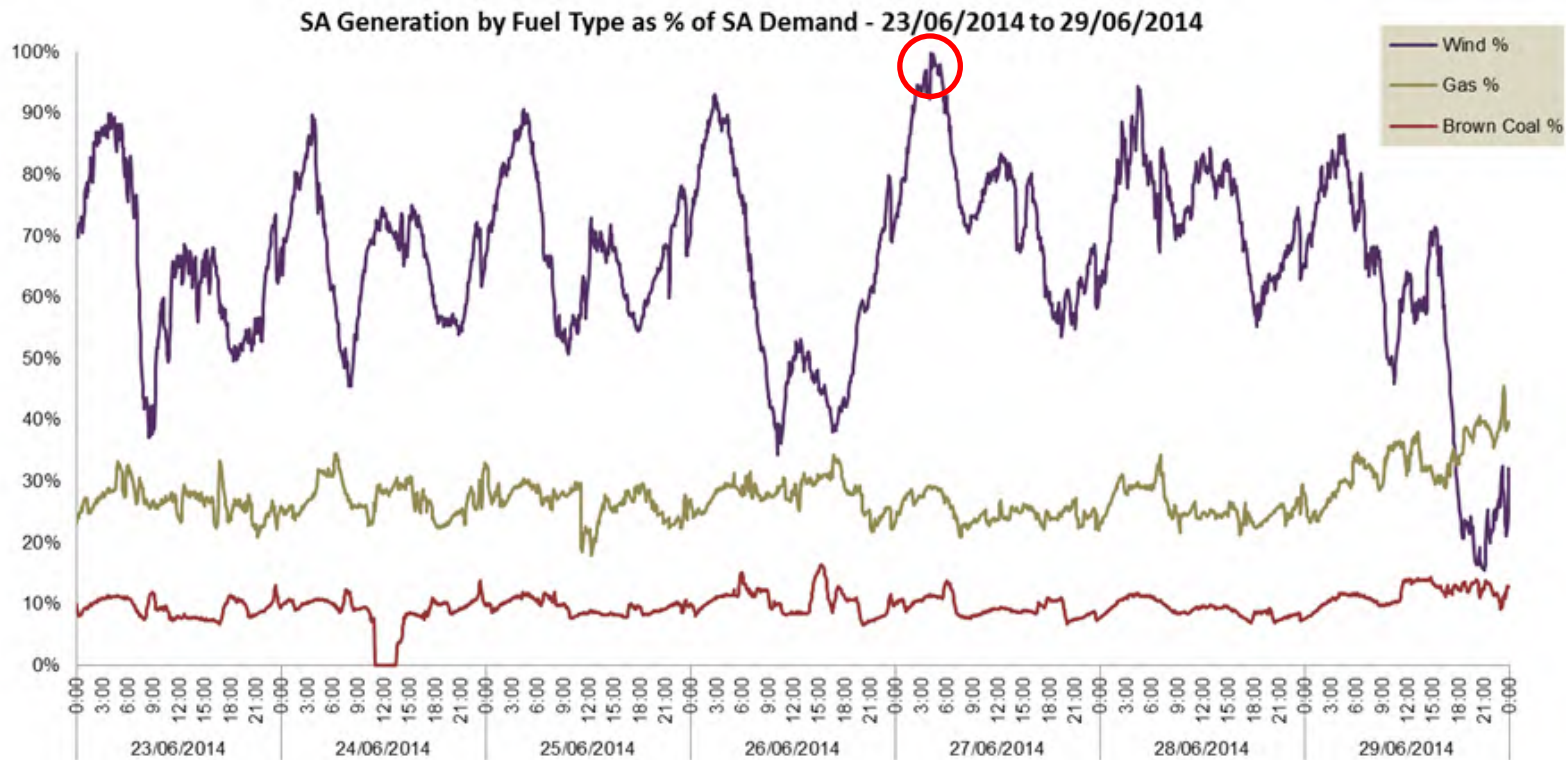


Note: Reduced emissions in Victoria when wind energy is being exported are not included



# Wind was the primary SA generation source for a week

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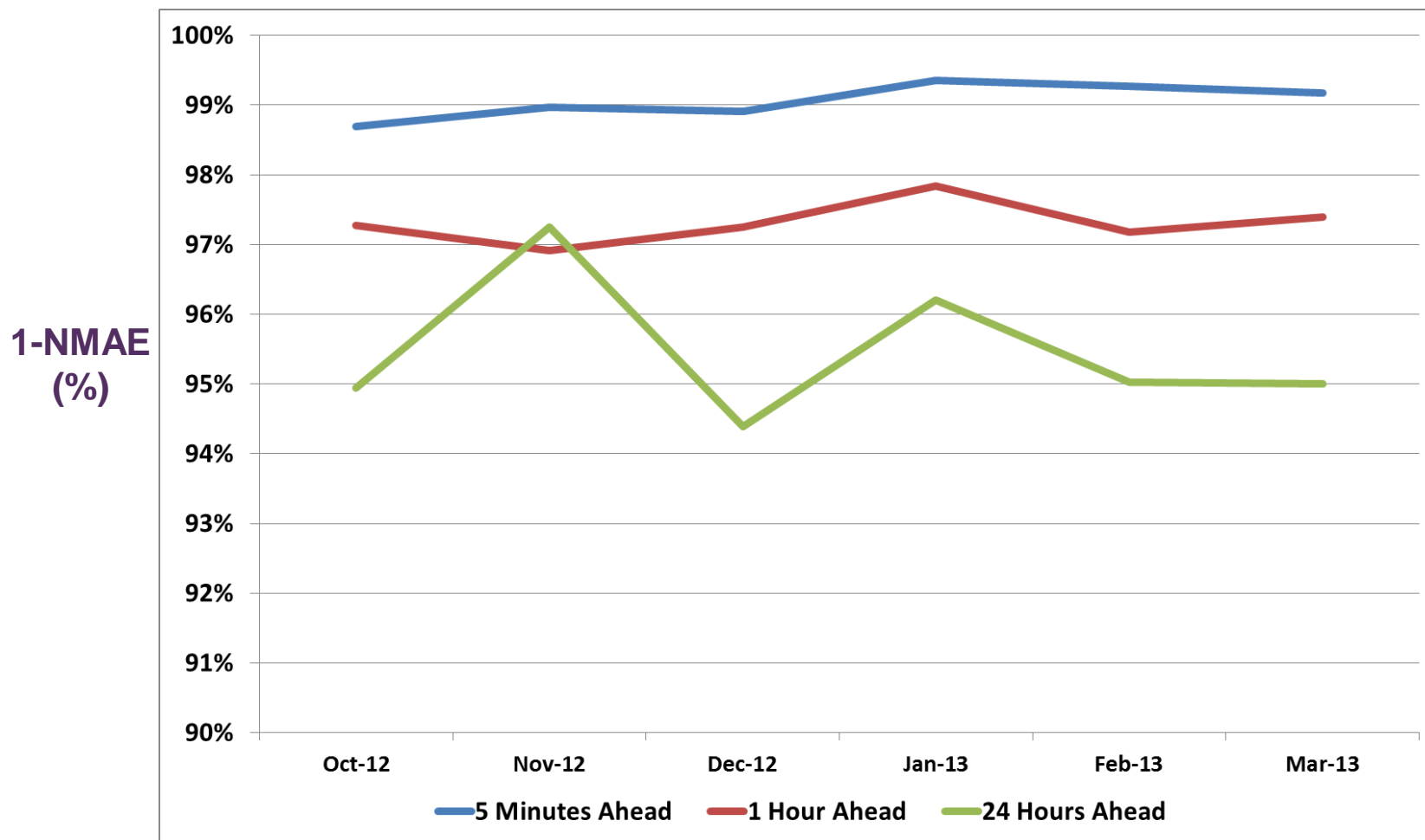


SA Wind generation even exceeded SA demand for a short period

# Wind generation is very predictable



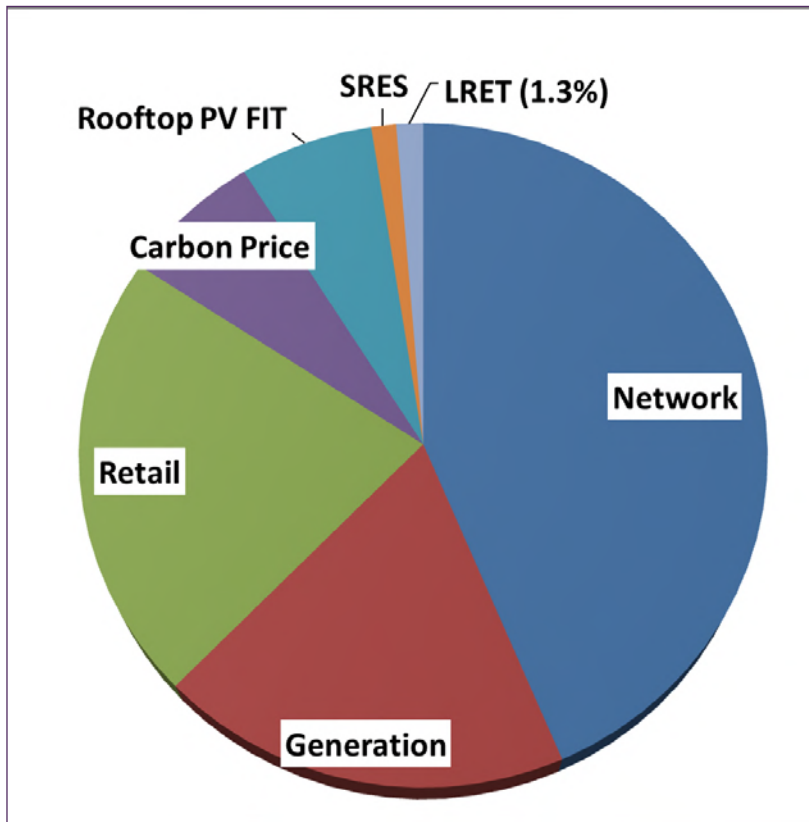
**NEM Wind Generation is Forecast with 97- 98% accuracy one hour ahead of time**



Data from Figure 64, 100% Renewables Study – Draft Modelling Outcomes, AMEO April 2013  
NMAE: Normalised Mean Absolute Error

Current *prima facie* cost of LRET has been determined  
This will be the only regulatory determination this year

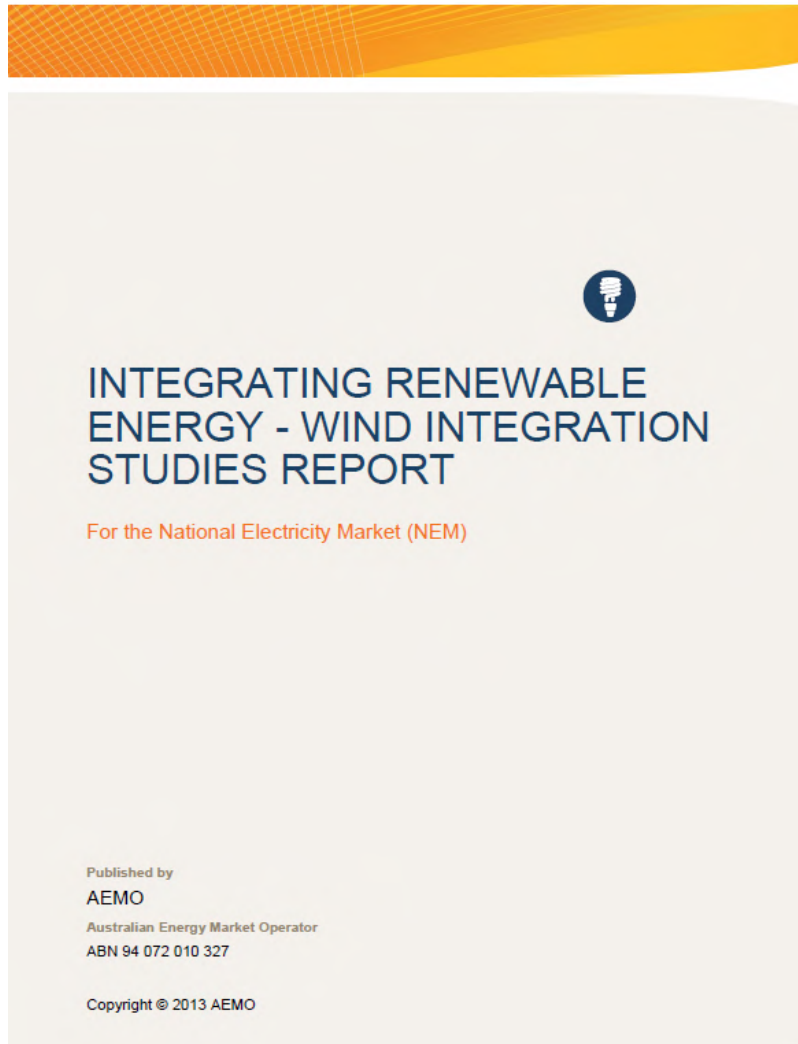
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Queensland  
Competition  
Authority

Average Monthly  
Household FY15 LRET  
Cost = \$2.25

# AEMO recognises wind energy's effect on wholesale market prices



“Wind generation capacity is normally offered for dispatch at very low prices, and is **typically the lowest-priced source of supply available.**”

# AEMO Data: Wind energy lowers wholesale prices in SA

Table 1 — Wholesale market prices for South Australia (average)

Financial year	SA renewable generation		SA fossil-fuelled generation		Total SA market generation		SA regional reference price
	Financial year	Summer <sup>a</sup>	Financial year	Summer <sup>a</sup>	Financial year	Summer <sup>a</sup>	Financial year
	Volume-weighted average	Volume-weighted average	Volume-weighted average	Volume-weighted average	Volume-weighted average	Volume-weighted average	Time-weighted average
	(\$/MWh)	(\$/MWh)	(\$/MWh)	(\$/MWh)	(\$/MWh)	(\$/MWh)	(\$/MWh)
2005–06	42.61	45.67	55.72	72.58	55.35	71.57	45.71
2006–07	58.89	55.80	71.27	72.34	70.45	71.19	60.88
2007–08	72.95	104.02	108.88	176.61	105.53	170.04	83.94
2008–09	51.33	73.80	75.65	124.19	72.19	116.71	56.44
2009–10	50.80	88.37	89.03	160.30	82.35	148.74	59.92
2010–11	25.25	26.64	44.58	63.48	40.35	55.37	34.20
2011–12	27.14	24.83	32.80	28.93	31.24	27.79	30.96
2012–13	57.70	53.76	76.65	66.88	71.36	63.61	69.92

a. Summer is defined as November to March inclusive, within the Australian mainland.

# Renewable Energy Target (RET) History

- Introduced by the Howard Government in 2001 requiring 9500 GWh of electricity to be generated from new renewable sources by 2010 (notionally 2% of supply)
  - Retailers are obligated to purchase a specific amount of new renewables each year
  - A substantial penalty is imposed if retailers do not comply
- Both major parties went to the 2007 election with policies to significantly expand and extend the RET
- A 45,000 GWh in 2020 RET was legislated in 2009 with tri-partisan support
- The schemes were split in 2010, again with tri-partisan support
  - A Small-scale RE Scheme (SRES) with a notional target of 4000 GWh in 2020
  - A Large-scale RET (LRET) with a requirement of 41,000GWh in 2020
- A legislated review of the RET was undertaken in 2012 by the CCA
  - The CCA recommended no significant changes except for delaying the next review until 2016

# Renewable Energy (Electricity) Act

## *'20% by 2020' does not appear anywhere in the Act*

### 40 Required GWh of renewable source electricity

- (1) Subject to subsections (2) to (4), the *required GWh of renewable source electricity* for a year is as set out in the following table:

Required GWh of renewable source electricity	
Year	GWh
2001	300
2002	1100
2003	1800
2004	2600
2005	3400
2006	4500
2007	5600
2008	6800
2009	8100
2010	12500
2011	10400
2012	12300
2013	14200
2014	16100
2015	18000
2016	22600
2017	27200
2018	31800
2019	36400
2020	41000

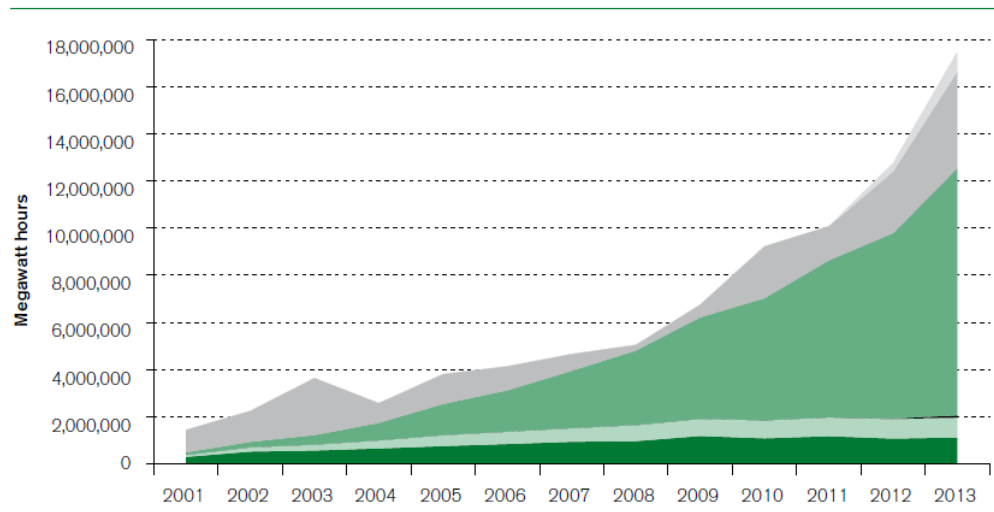
Required GWh of renewable source electricity	
Year	GWh
2021	41000
2022	41000
2023	41000
2024	41000
2025	41000
2026	41000
2027	41000
2028	41000
2029	41000
2030	41000

Not one dollar has been invested on the basis of a '20% by 2020' target

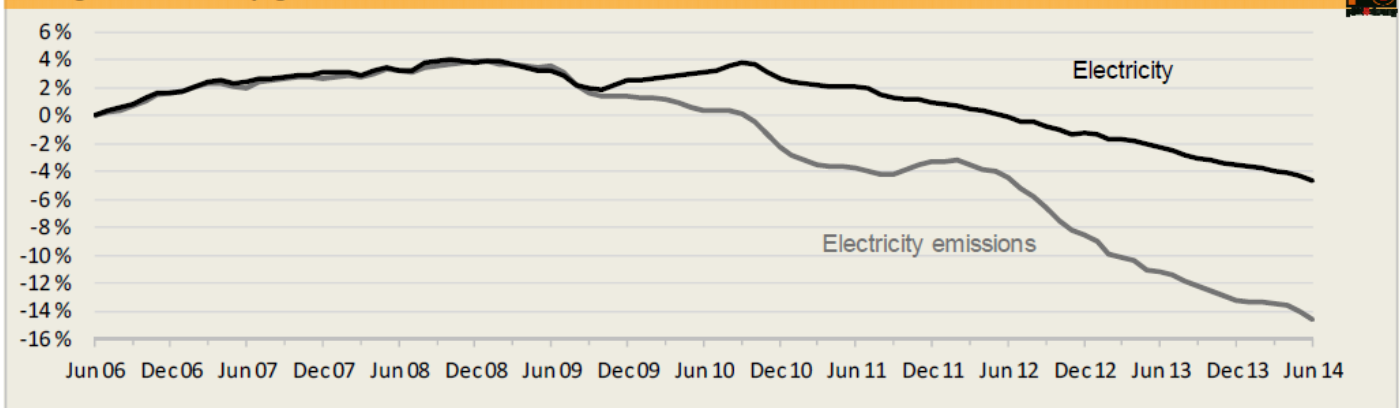
# The LRET is undeniably achieving the Act's objectives

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**Graph 2:** Supply of large-scale renewable electricity generation, 2001 to 2013



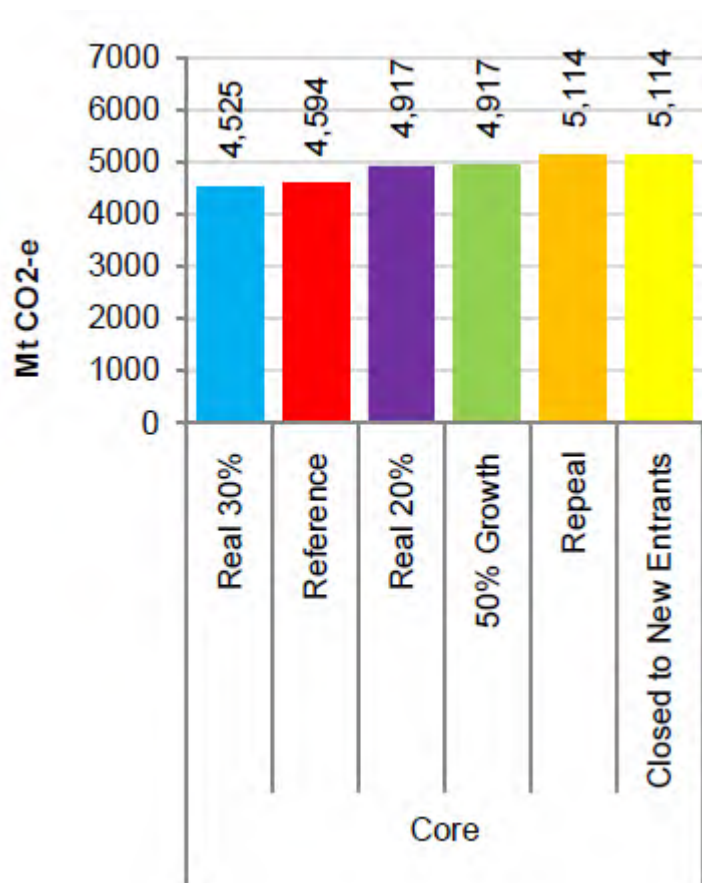
**Changes in electricity generation and emissions**





# What did we learn from the Warburton Review?

## *Lesson #1 – Greenhouse emissions*

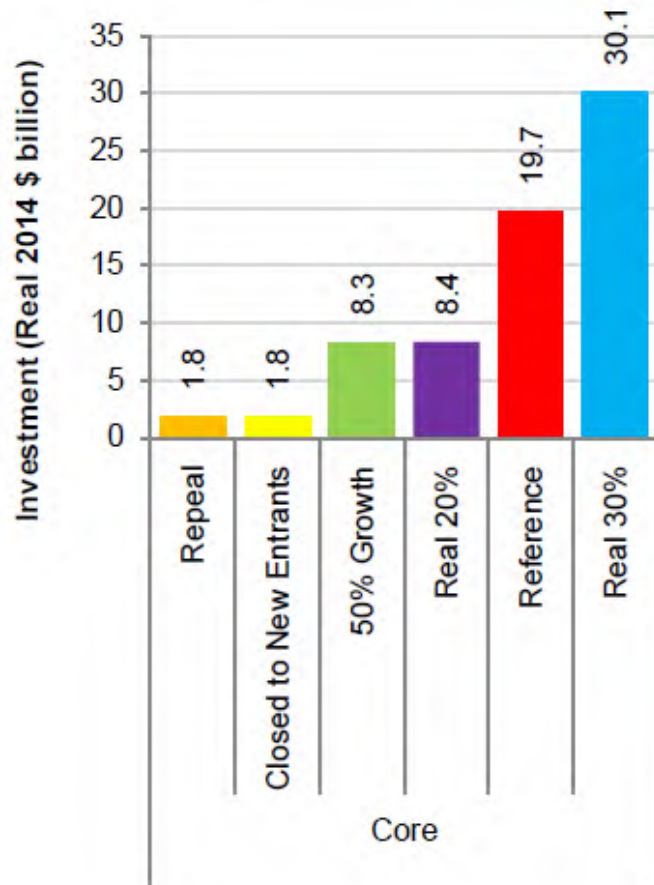


Greenhouse Emissions  
were Lowest for the Increase  
and Maintain RET Scenarios

RET Review Modelling ACIL Allen 7 August 2014

Figure ES 4 Aggregate emissions from electricity generation: 2015-2040 :

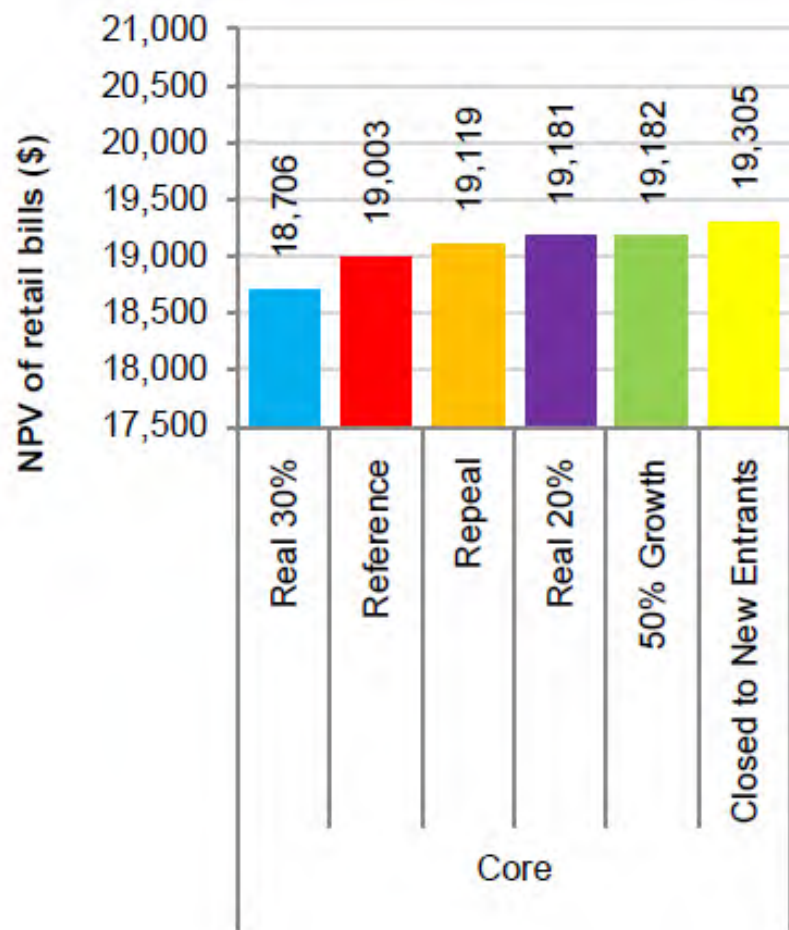
## Lesson # 2 – Regional investment and jobs



Investment (and Jobs) are highest for the '30% by 2030' and BAU Cases

Figure 112 Total investment in Large-scale renewable generation: 2015-2040:

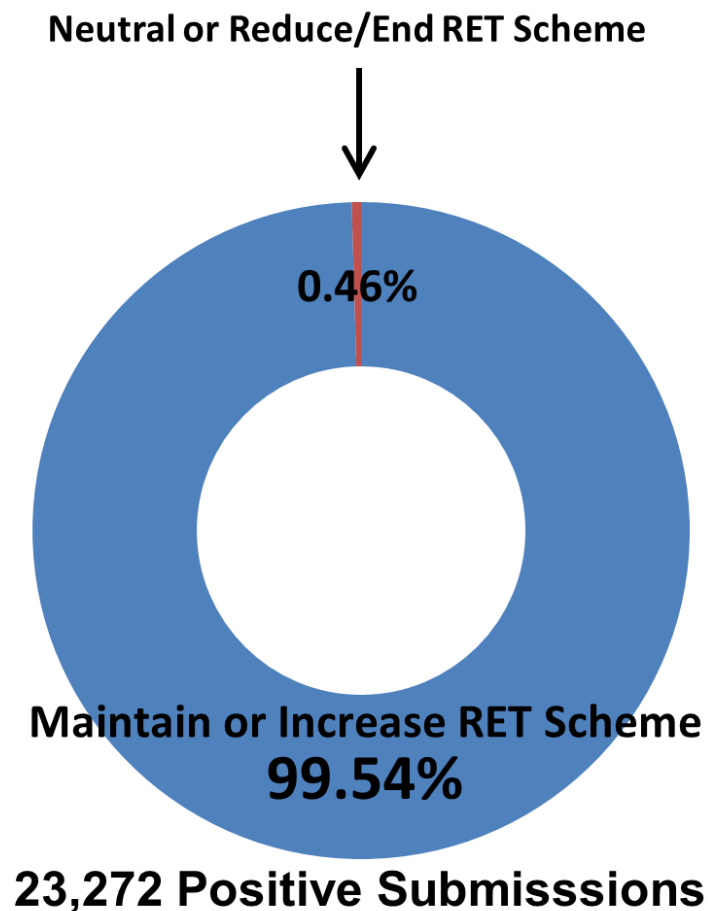
## Lesson # 3 – Impact on Electricity Prices



Increasing the RET will result in the Lowest Electricity Bills for Consumers

Figure ES 5 NPV of average household total expenditure on electricity (2015-2040)

## Lesson #4 – Categorisation of submissions (overlooked in the Panel's report)



99.5% of Submissions  
Supported Increasing or  
Maintaining the RET target

## Lesson #5 - *Who benefits from the LRET being reduced?*

**“The Real 20% scenario improves the profitability of fossil fuel generation across Australia due to the higher wholesale prices which prevail under this Scenario...**

**The shift to the lower mandated LRET improves coal-fired generators values by around \$9.3 billion present values terms (\$6.6 billion for black coal; \$2.7 billion for brown coal).”**

# Summarising what we learned

- The 'Closed to New Entrant' and '50% of Growth' Scenarios would result in:
  - The highest levels of greenhouse (and particulate) pollution
  - The least regional investment and jobs
  - The highest electricity prices
  - Windfall gains to coal fired generators in the billions of dollars
- These two scenarios were supported by a total of less than 0.5% of submissions to the Review
- Therefore, it logically follows that the Panel would not recommend....

# Warburton Panel's Recommendation



The 'Closed to New Entrants' or '50% of Growth Scenario'

Cartoon from the Australian Financial Review 30 April 2014

# Six independent electricity market modelling studies show reducing RET will not reduce consumer prices



- ACIL Allen's modelling confirmed the earlier results from SKM (Jacobs), Schneider Electric, ROAM, IES, and Bloomberg
- All six studies generated similar results; a reduced "real 20%" LRET causes
  - Retail prices to decline by a small amount in the short term
  - Followed by retail prices rising by a larger amount in the medium and long term
- The **AiGroup** recognises this in their RET Review submission media release

***"we have judged that reducing the RET is likely to cost energy users as much in higher wholesale prices as it saves them in direct RET charges."***





# Bloomberg's analysis summarises the situation well

## Power giants get \$12b, consumers get just \$10

SCRAPPING renewable energy targets would deliver electricity generators up to \$12 billion in extra annual revenue in the five years to 2020 but the benefit to consumers would be a discount of just \$10 a year.

The analysis of the benefit to power companies of cutting the target found that it would increase over time, with savings of \$70 billion delivered in the decade to 2030.

The report by Bloomberg New Energy Finance claims that consumers would save \$10

a year for four years if the target were cut but beyond that, bills would go up due to less supply and competition in the power sector.

Scrapping the renewable energy target would threaten up to \$21 billion of investment in renewable energy by creating "less competition among fossil-fuel power generators and strong future increases in the price of electricity", Kobad Bhavnagri, Bloomberg New Energy Finance head of Australia said.

Courier Mail May 26, 2014

Taken separately, if the LRET was terminated, then between 2015-2020, the results would be:

- Electricity costs to consumers will be 22% higher
- Consumers will pay \$600 Million/year more for electricity
- Electricity sector greenhouse emissions will be 5% higher
- 11,000 fewer people will be employed

**Bloomberg**  
NEW ENERGY FINANCE

MODELLING OPTIONS FOR AUSTRALIA'S RET REVIEW  
16 MAY 2014

# Renewable Energy is a Hedge Against High Gas Prices

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“Australian electricity prices could become exposed to the possibility of sudden, unexpected high international [gas] prices over which we have little domestic control or short term ability to mitigate”.

“This can be addressed by supporting the development of a diverse generation portfolio, particularly including renewable technologies (which are not vulnerable to fuel price volatility or uncertainty)”.

**NSW’s recent 17% increase in gas prices are just the beginning; gas fired generation will soon become very expensive**

# Renewable Electricity Generation in NSW

- In 2012, 7881 GWh of electricity, comprising about 11% of NSW's total, was generated from renewable sources<sup>1</sup>
  - Over two-thirds of this amount was from hydroelectric plants (i.e. Snowy Hydro)
- Three large wind farms are currently under construction in NSW
  - Gullen Range, Boco Rock and Taralga totalling 385MW of capacity
    - These wind farms will increase wind energy capacity in NSW by 135%
- AGL is currently constructing two large scale PV generation facilities
  - Nyngan and Broken Hill totalling 164MW of capacity
- The NSW Government's Renewable Energy Action Plan details 24 specific actions to facilitate renewable energy (and energy efficiency measures)
  - The stated goal is to have 20% of NSW's electricity from renewable sources by 2020

<sup>1</sup> NSW Renewable Energy Action Plan 2013

# SA, Victoria and WA have seen the most investment



## PERCENTAGE OF INSTALLED WIND CAPACITY BY STATE<sup>68</sup>

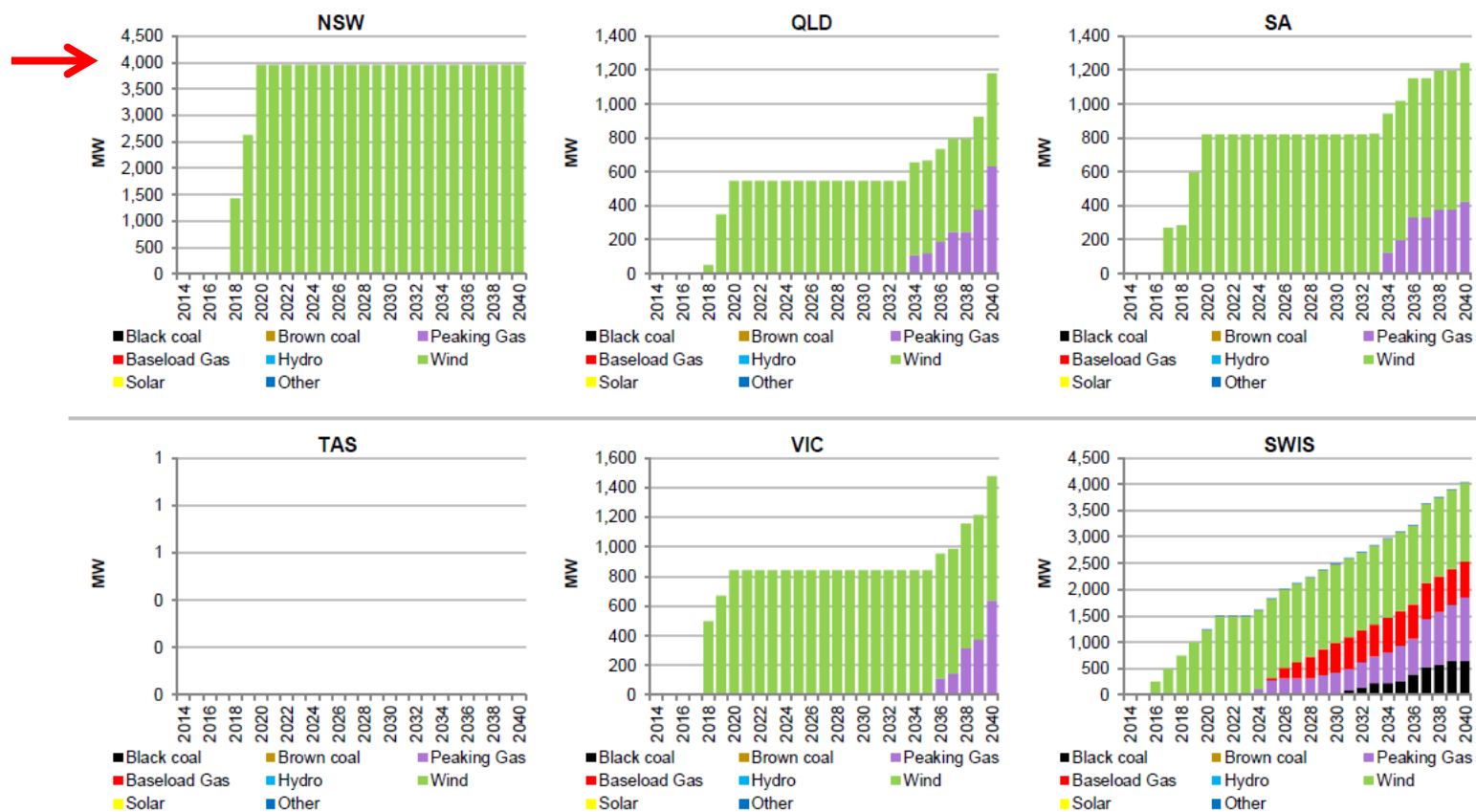


SA	37.2%	TAS	9.6%
WA	15.2%	NSW	8.7%
VIC	29%	QLD	0.4%

The State with the largest population is only ahead of Queensland in wind energy investment

# Another 'lesson' from the Warburton Review

Figure 8 New entrant capacity by grid: Reference case



NSW is set for 4x the near term investment of any other State in the NEM

# The Future for Renewable Energy in NSW

- If the Commonwealth's RET scheme is significantly reduced or 'stretched out', the NSW RE target will be much more difficult, and expensive, to achieve
  - NSW will be the 'Biggest Loser' if the RET scheme is scaled back
  - NSW coal fired generators would be the big winners even though they were all purchased with full knowledge of the legislated 41,000 GWh LRET target
- If bi-partisan support is achieved for the current, or increased/extended, LRET target, then the future for renewable energy in NSW will be very bright
  - NSW is very likely to benefit more than any other State



# Questions

