

# Australian Energy & Utility Summit

## Unlocking Wind Energy in Australia

6 August 2010



# Agenda

The Infigen logo consists of the word "infigen" in a lowercase, sans-serif font, enclosed within a white square border. The logo is positioned in the top right corner of the slide, which features a background image of a sunset or sunrise over a body of water, with a gradient from purple to pink to orange.

- **Overview of Infigen Energy**
- Global Deployment of Wind Energy
- Availability of Wind Energy Resources in Australia
- Maintaining Government Support for Wind Energy
- Key Conclusions
- Questions

## **Presenter:**

Miles George      Managing Director

## **For further information please contact:**

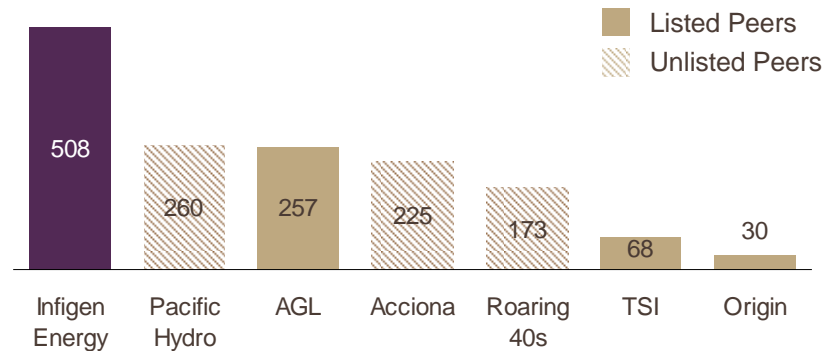
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# Infigen Energy Overview

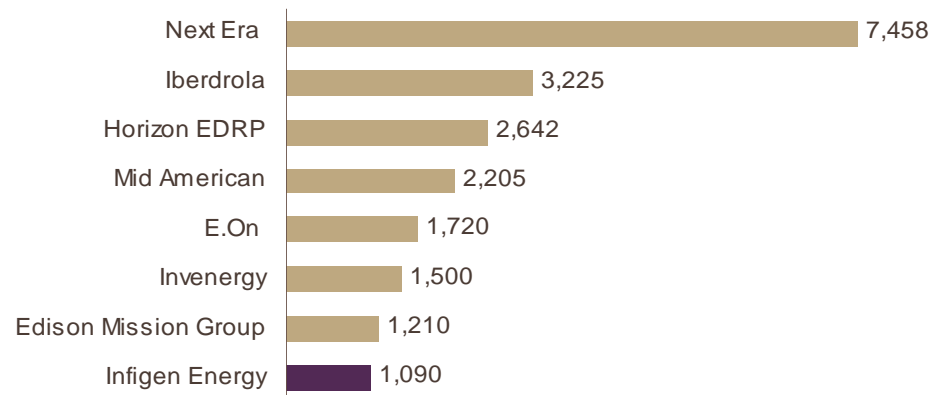


- Operate over 2,100MW of wind energy generation globally
- Largest owner of wind energy capacity in Australia
- Development, asset management and energy markets capabilities in Australia
- Own & operate a top 8 business in US wind energy industry
- Highly experienced US Bluarc asset management team
- ASX listed (ASX:IFN) with market cap of \$A600m+

## Australian Wind Farm Owners (operating MW)<sup>1</sup>



## US – Top eight wind farm owners by installed capacity (MW)<sup>2</sup>



1. Clean Energy Council (2010) and company Websites. Excludes contracted capacity.  
 2. American Wind Energy Association: 2009 Annual Report

# Major Australian Projects

Australia's leading specialist wind energy and renewable energy developer and operator



## LAKE BONNEY 1

**Location:** South Australia  
**Status:** Operational March 2005  
**Installed Capacity:** 80.5MW  
**Turbine:** 46 Vestas V66



## ALINTA

**Location:** Western Australia  
**Status:** Operational January 2006  
**Installed Capacity:** 89.1MW  
**Turbine:** 54 NEG Micon NM82



## LAKE BONNEY 2

**Location:** South Australia  
**Status:** Operational September 2008  
**Installed Capacity:** 159.0MW  
**Turbine:** 53 Vestas V90



## CAPITAL

**Location:** Bungendore, NSW  
**Status:** Operational November 2009  
**Installed Capacity:** 140.7MW  
**Turbine:** 67 Suzlon 2.1MW S88



## LAKE BONNEY 3

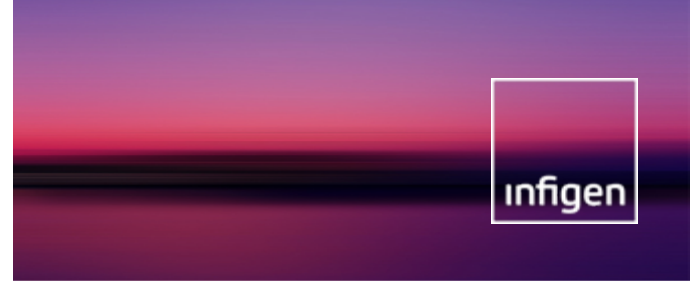
**Location:** South Australia  
**Status:** Operational June 2010  
**Installed Capacity:** 39.0MW  
**Turbine:** 13 Vestas V90



## WOODLAWN

**Location:** New South Wales  
**Status:** Issued notice to proceed  
**Installed Capacity:** 42.0MW  
**Turbine:** Suzlon 2.1MW S88

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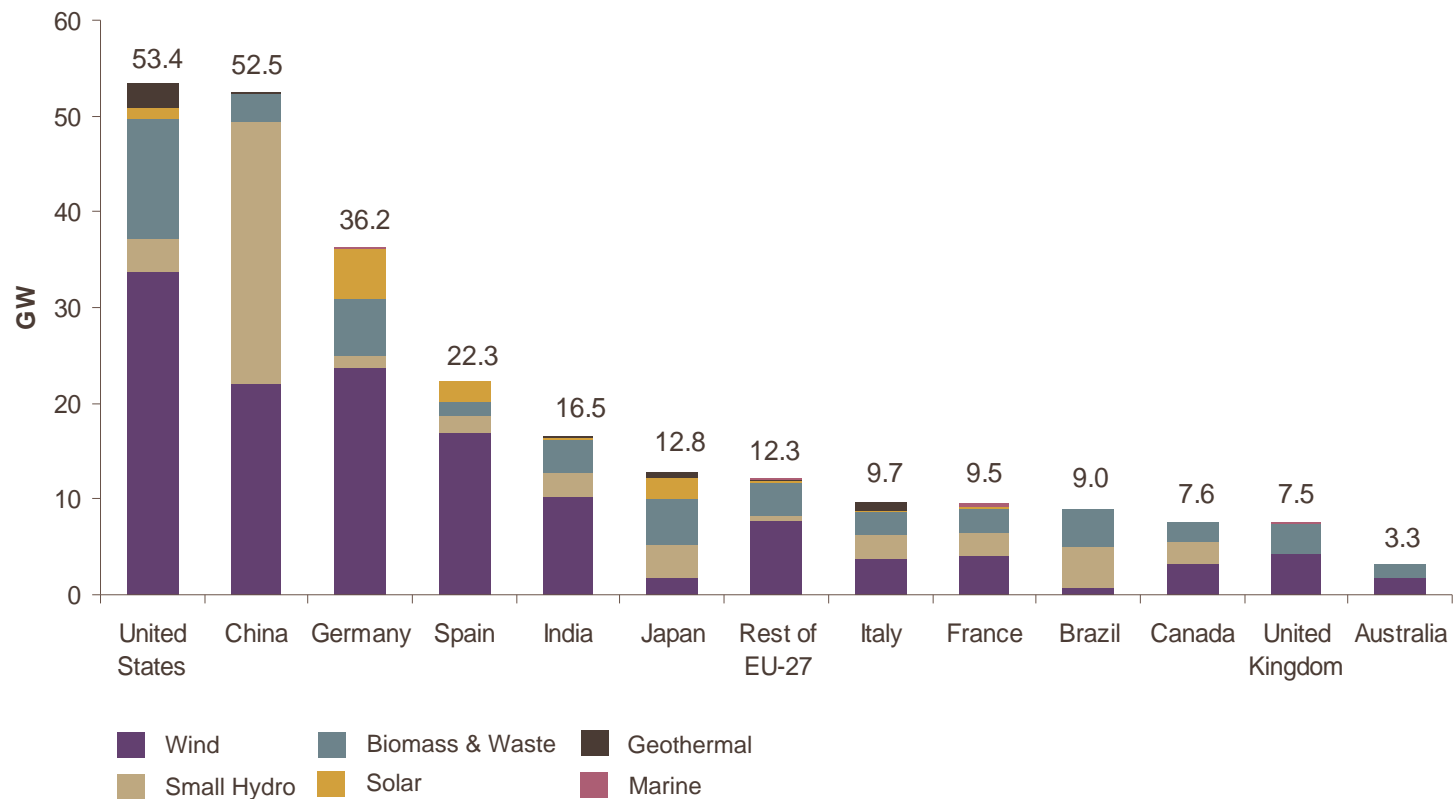


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# Global Deployment of Renewable Energy

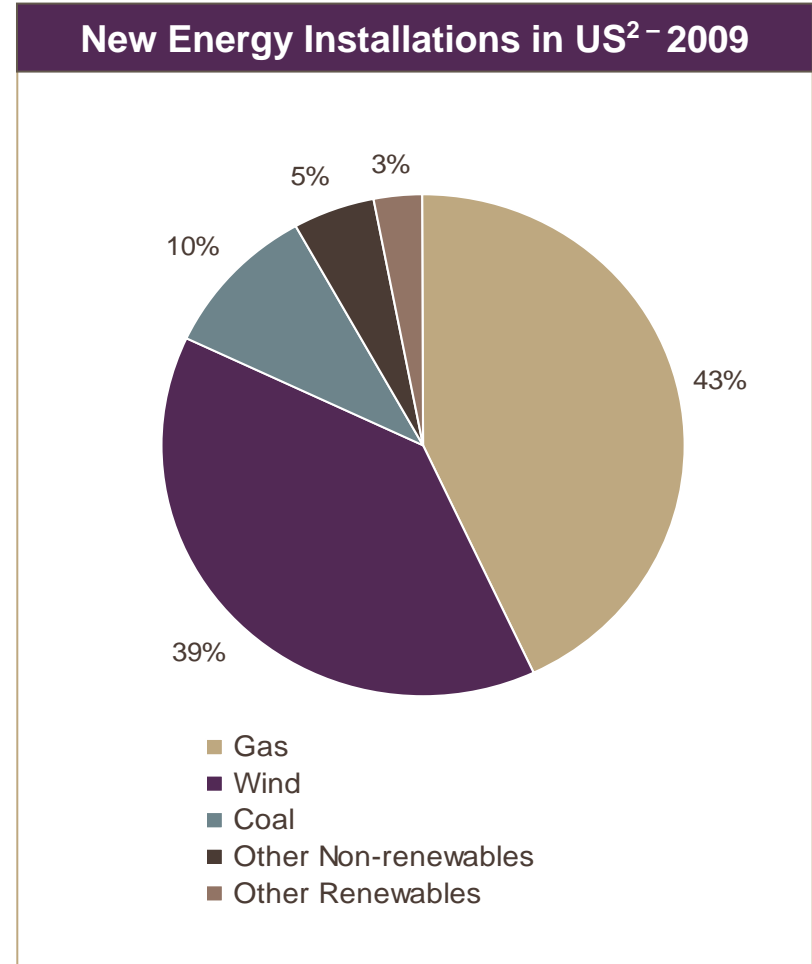
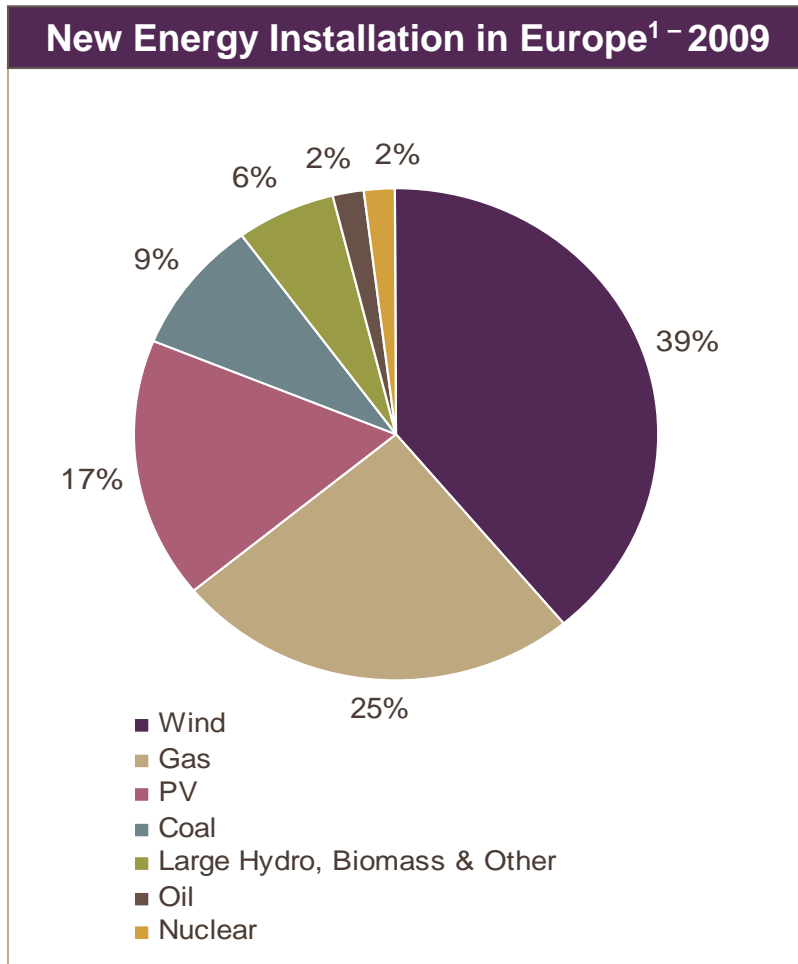
Wind energy dominated installed renewable energy generation at the end of 2009

## Installed Renewable Energy Capacity at the end of 2009 (GW)



# European and US New Energy Installations

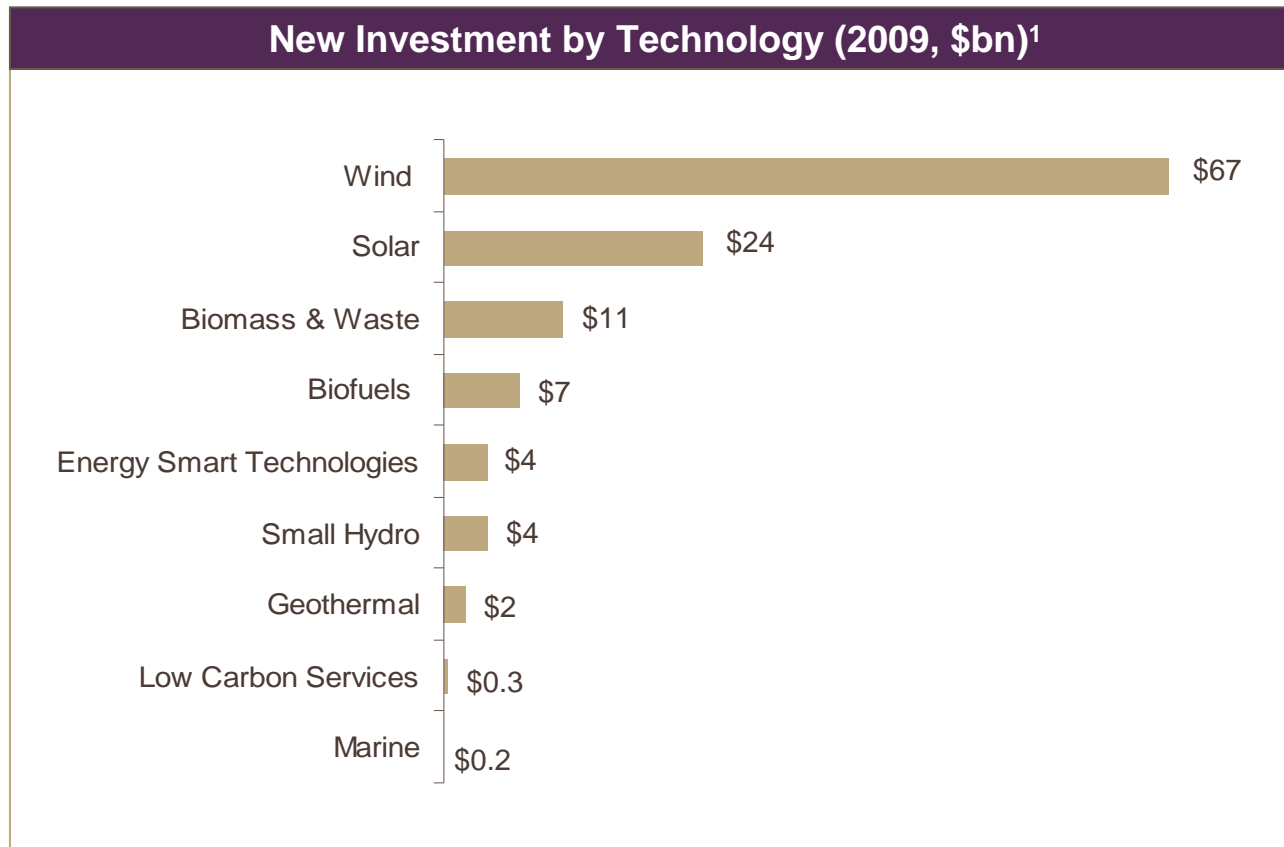
Wind energy accounted for 39% of all new generation capacity in the US & Europe in 2009



1. European Wind Energy Association: 2009 Industry Statistics  
 2. American Wind Energy Association: 2009 Annual report (% approximate)

# Global Investment By Renewable Energy Type

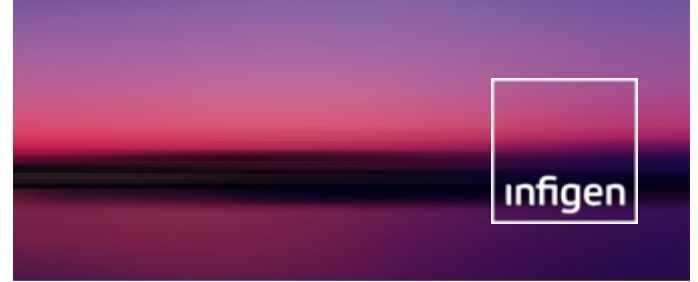
Global Wind Energy Investment accounted for 56% of total renewable energy investment in 2009, up from 45% in the previous year



1. United Nations Environment Program (ENEP), Global Trends in Sustainable Energy Investment (2010)



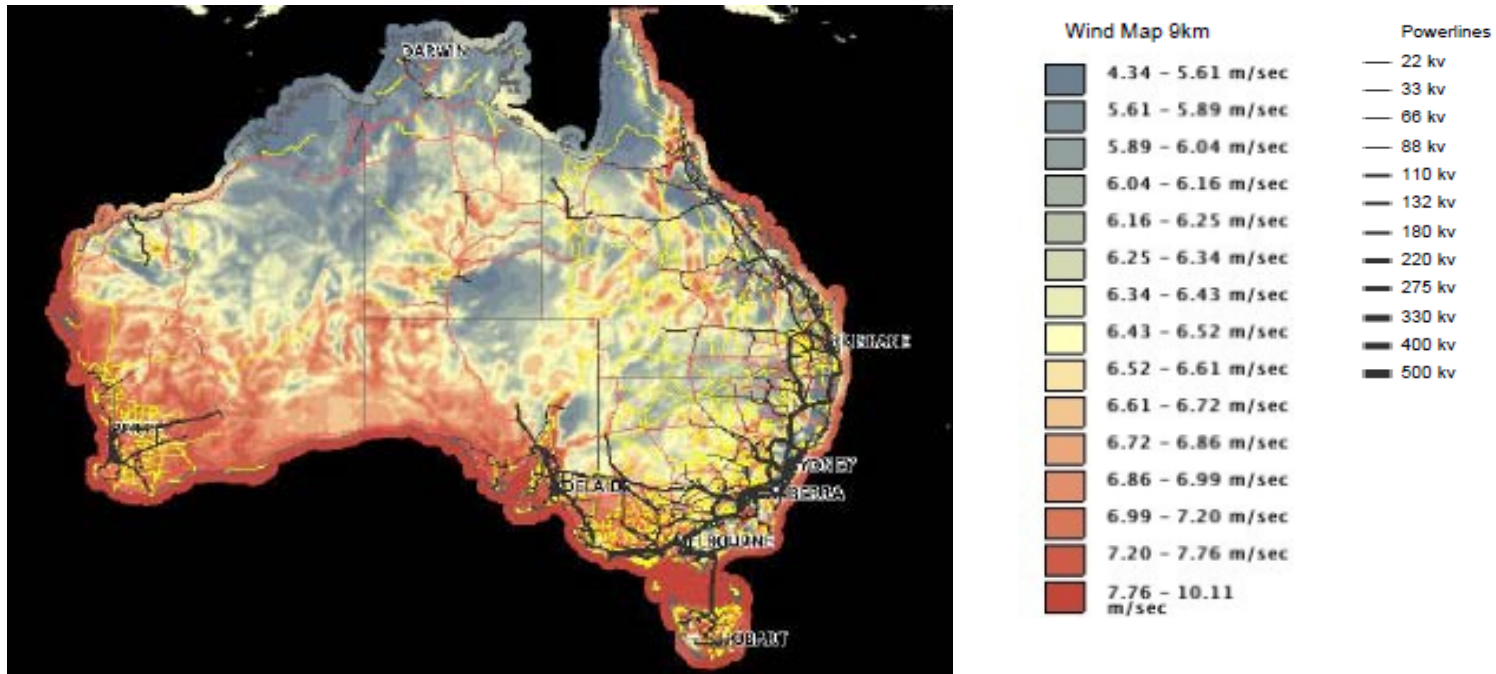
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# Australian Wind Energy Resource

Straight forward connections in high wind resource areas are becoming scarce



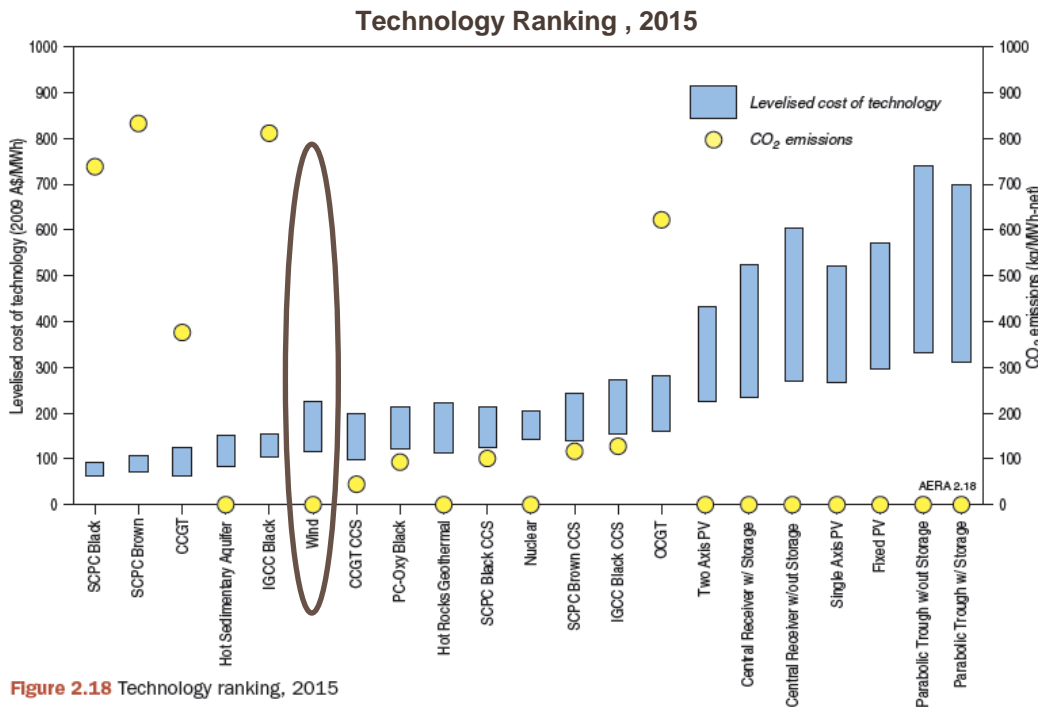
Source: Department of the Environment, Water, Heritage and the Arts

Augmentation of the grid will be required to efficiently satisfy LRET

# Comparative Energy Costs

Wind Energy is the most cost effective utility scale renewable technology

## Comparative Cost of Wind with Conventional & Renewable Energy Generation



**Figure 2.18** Technology ranking, 2015

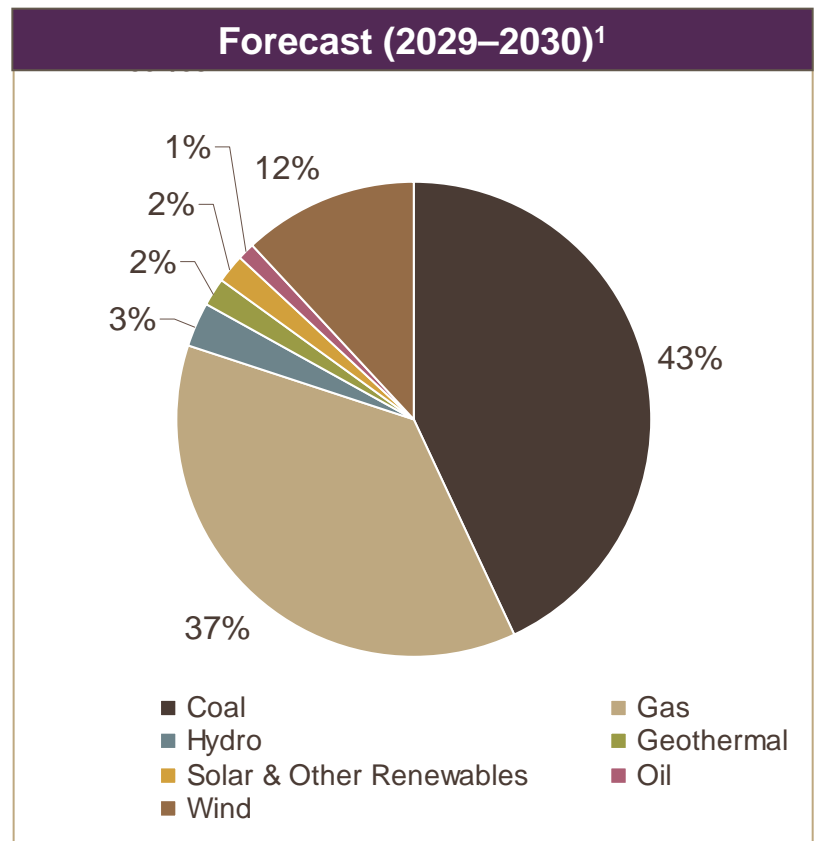
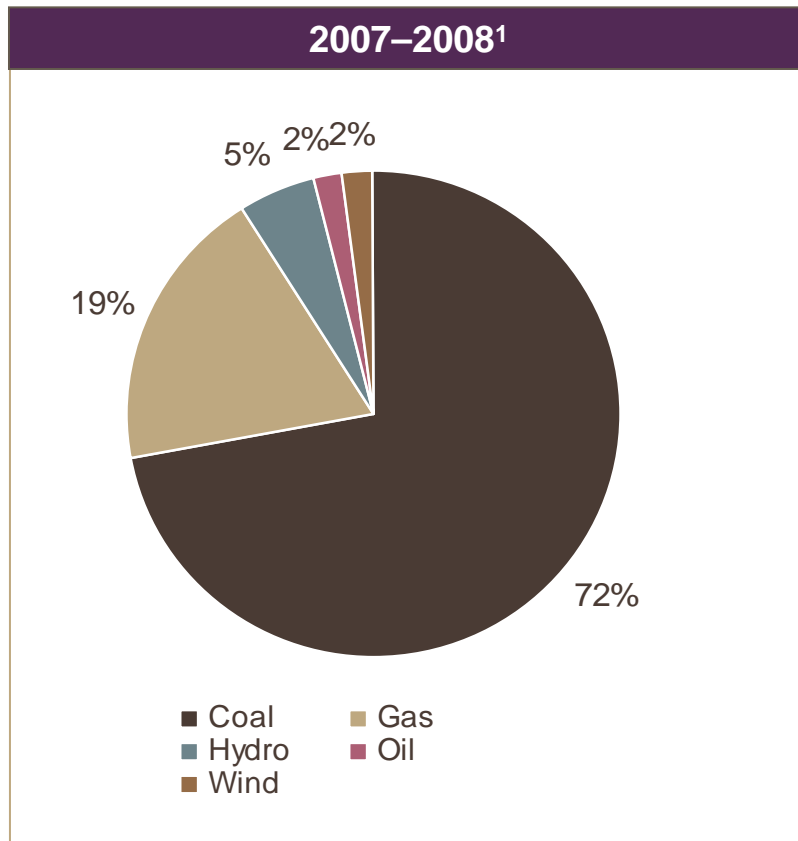
Source: EPRI technology status data, 2010

- Wind energy is the most cost effective utility scale technology under least cost, technology neutral incentives schemes
- Hot rocks geothermal technologies are not proven in utility scale and are likely to suffer remote location disadvantages
- Utility scale solar technologies are still substantially more expensive than wind energy but costs are reducing for Solar PV

Source: Australian Energy Resource Assessment. EPRI technology status data 2010. Levelised cost of technology estimates based on simplified pro-forma costs. Levelised cost of technologies includes weighted cost of capital (8.4% real before tax); excludes financial support mechanisms, excludes grid connection, transmission and firming (standing reserve requirements); and includes a notional allowance of 7.5% for site specific costs.

# Australian Generation by Fuel Type

Penetration of wind energy is expected to grow by a factor of over five times to 12% by 2020



**Australian new build electricity generation capacity will be dominated by wind energy and gas fired generation**

1. Australian Energy Projections to 2029/2030: ABARE Research Report March 2010

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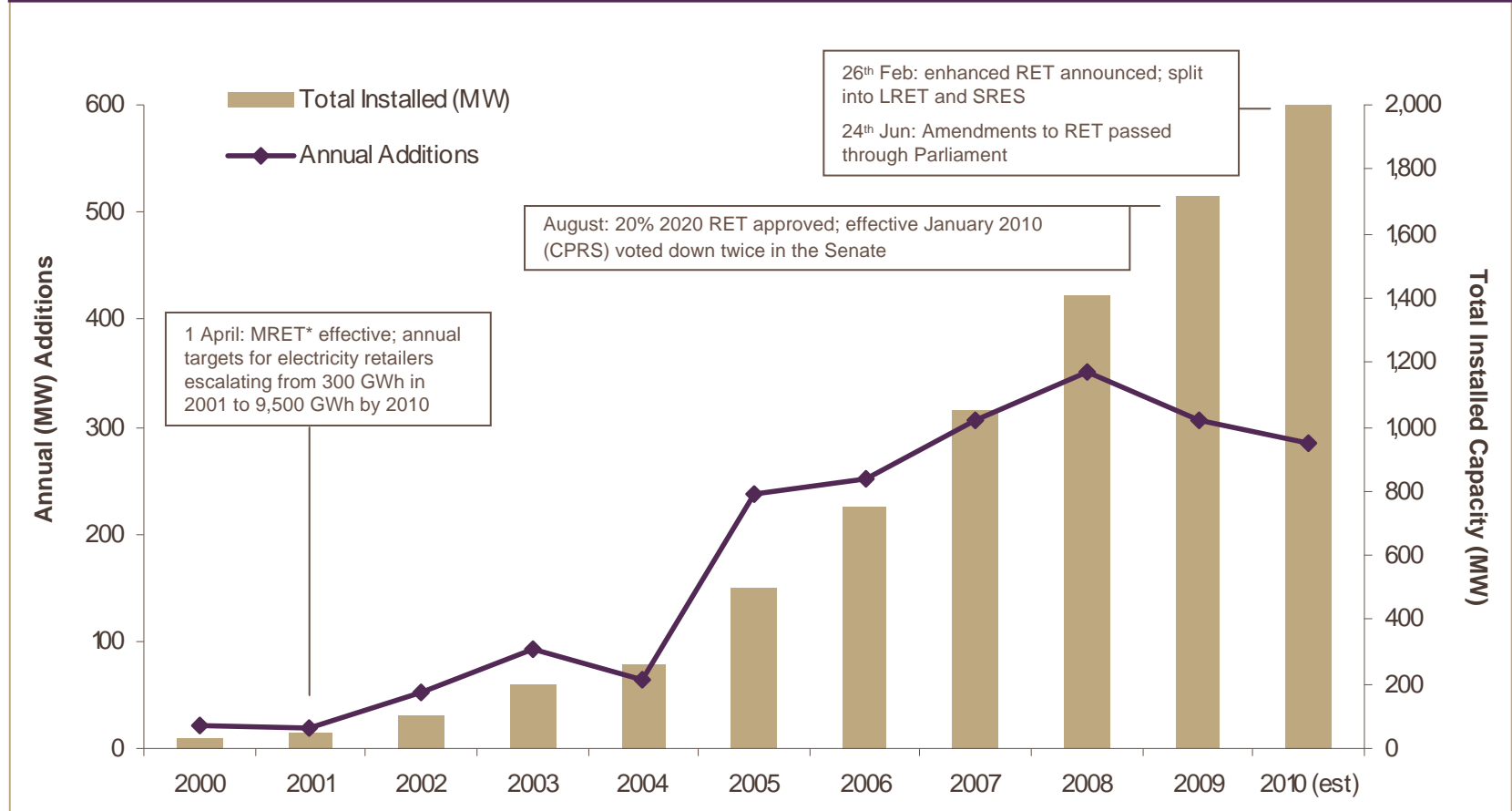
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# Wind Energy and Policy Frameworks in Australia

Government commitments have contributed to a steady increase in wind energy since 2005

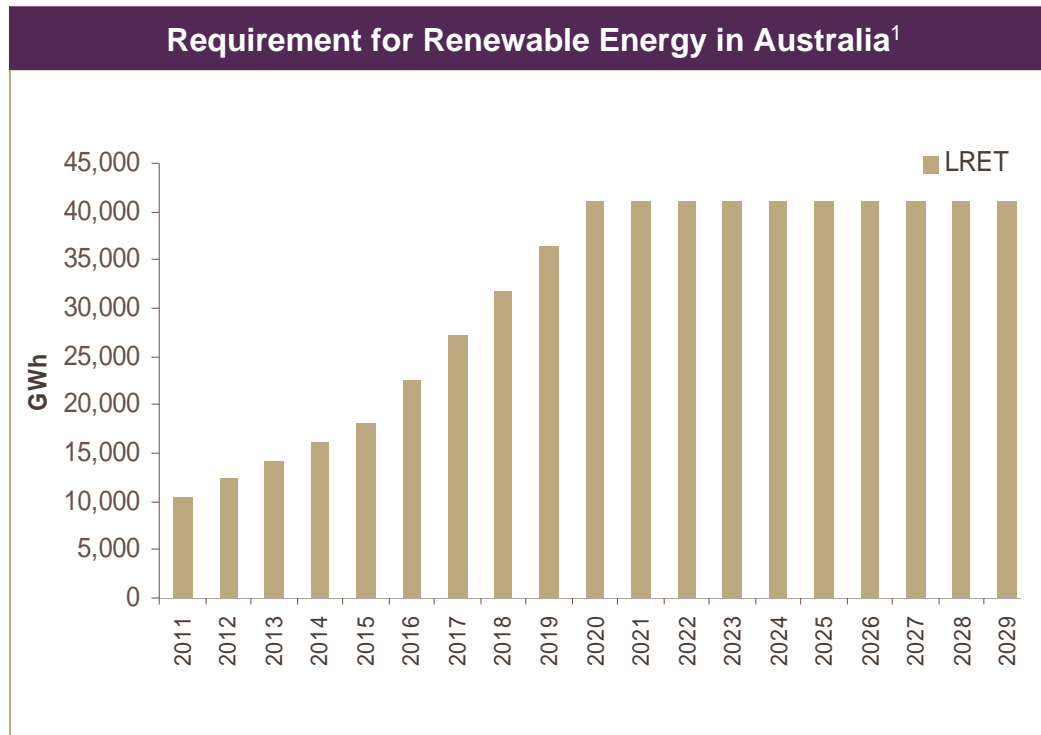
## Australia Wind Market Development: 2000-2010 (est.)



Note: \*MRET = Mandatory Renewable Energy Target. \*\*National Energy Markets include Queensland, Victoria, New South Wales, South Australia, Tasmania and the Australian Capital Territory  
 Source: Emerging Energy Research, Australian Wind rebounds October 2009; Global Wind Energy Council, Clean Energy Council, Fact Sheet March 2010.  
 Notes: Assumes 284MW of additions to installed capacity.

# Evolution of LRET

Implementation of LRET will improve the prospect of achieving the 20% by 2020 renewable energy target

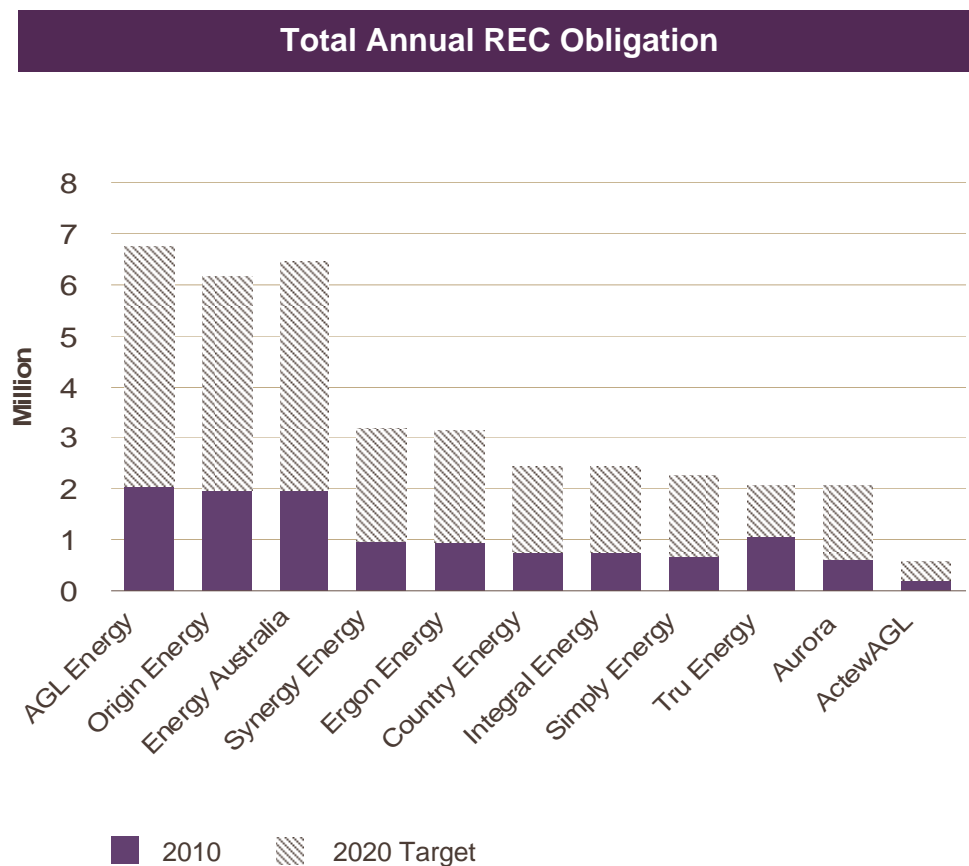


- Recent amendments to the legislation and the implementation of LRET from January 2011 will provide for over 90% of the expanded RET target to be met by large scale renewable energy projects
- The LRET surplus is a critical element in determining short to medium term investment
  - Provision to temporarily increase the targets in 2012 and 2013
  - Offset by a reduction of the targets by the same amount of RECs between 2016 and 2019

1. Enhanced Renewable Energy Target: Fact sheet July 2010

# LRET Obligations for Electricity Retailers

With annual LRET obligations increasing from 12,500GWh in 2010 to 41,000GWh in 2020, leading retailers will need to expand their Renewable Energy portfolios



**Projected Wind Demand Through 2020**

Obligated Retailer	Wind-Derived GWh Obligation per Retailer <sup>1</sup>	Projected MW Wind Demand per Retailer <sup>1</sup>
AGL Energy	5,047	1,800
Origin Energy	4,606	1,643
Energy Australia	4,829	1,723
Synergy Energy	2,392	853
Ergon Energy	2,347	837
Country Energy	1,828	652
Integral Energy	1,816	648
Simply Energy	1,709	610
TRU Energy	1,560	557
Aurora Energy	1,553	554
ActewAGL	477	160
Other	2,618	934
<b>Total</b>	<b>30,750</b>	<b>10,970</b>

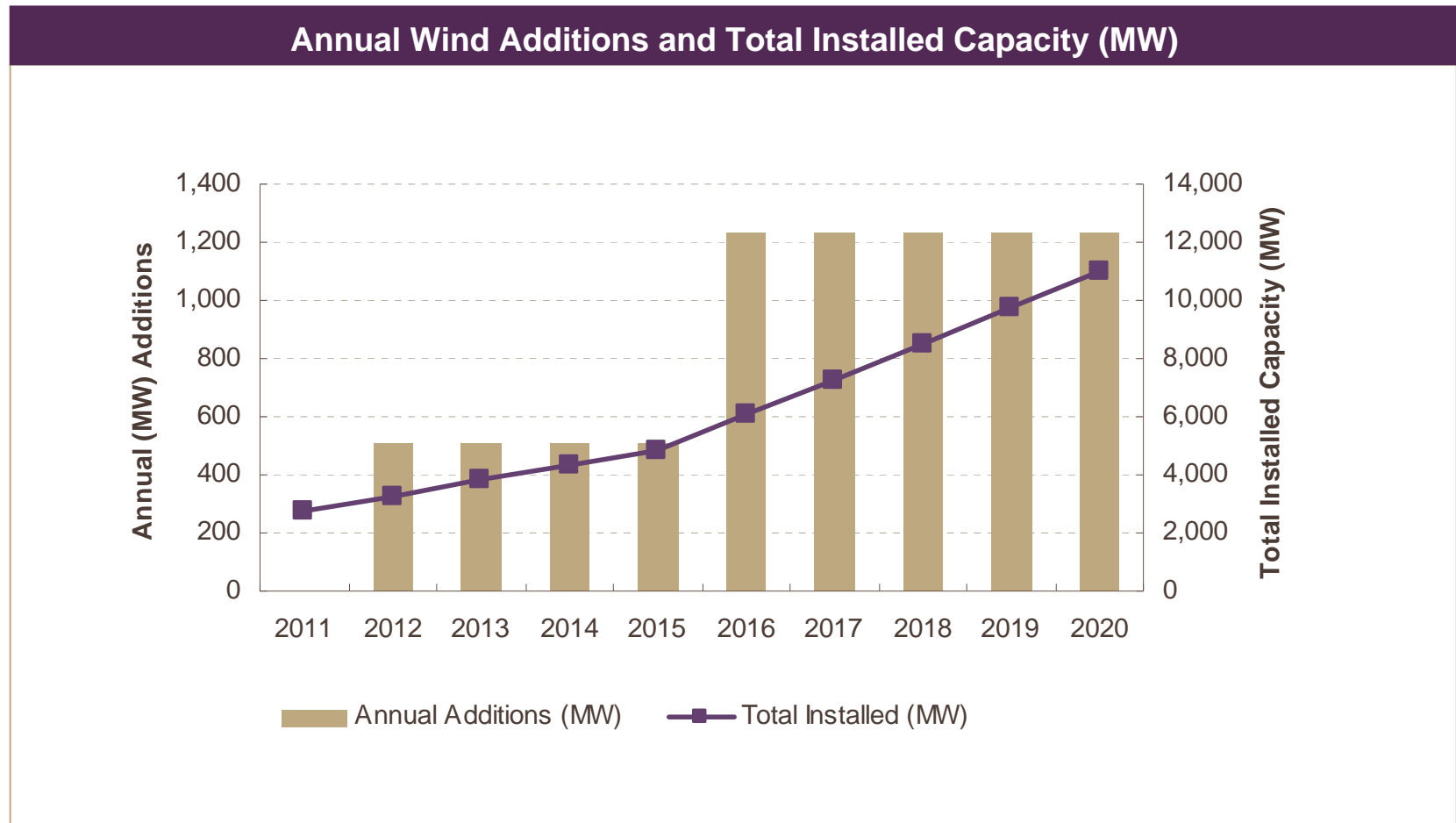
Source: Company reports, Renewable Energy (Electricity) Act 2000: Amended up to Act no 69 (2010), ABARE Energy Update July 2010 and AEMO

1. Assumes 32% average capacity factor, wind contributes 75% of total LRET per retailer, constant market share per company by 2020.



# Australia Wind Energy Capacity Forecast

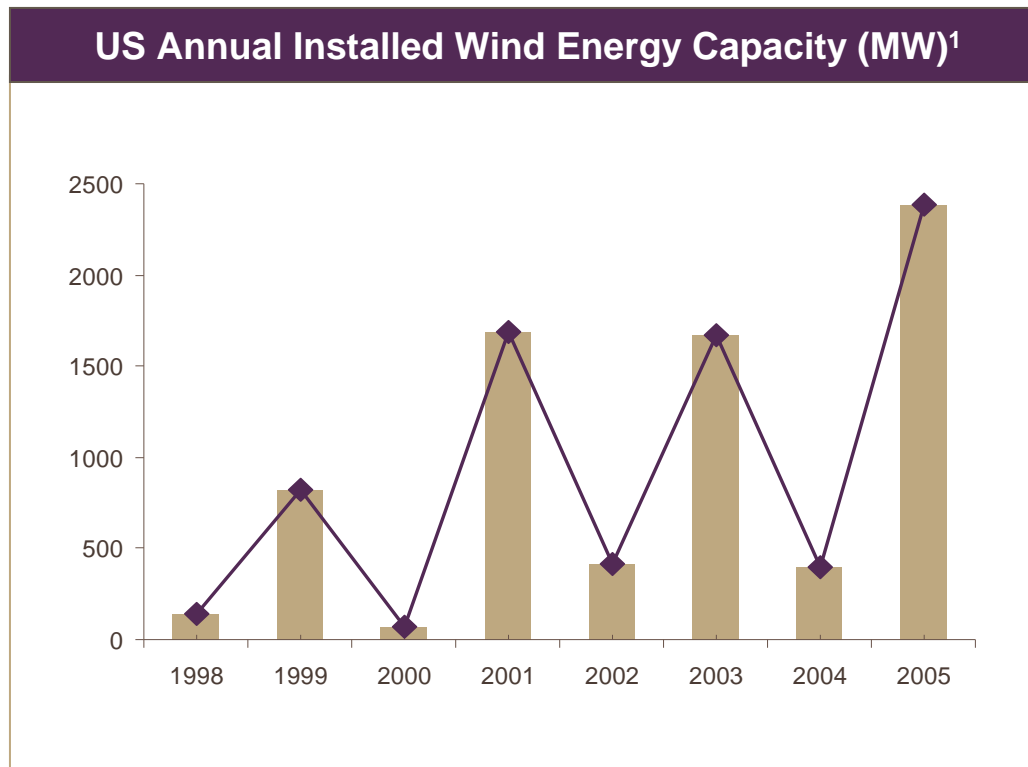
Wind energy expected to increase to >11 GW following implementation of the LRET



Source: Renewable Energy (Electricity) Act 2000: Amended up to Act no 69 (2010)  
 Note: Assumes 32% average capacity factor, wind contributes 75% of total LRET

# US PTC Renewable Energy Incentive

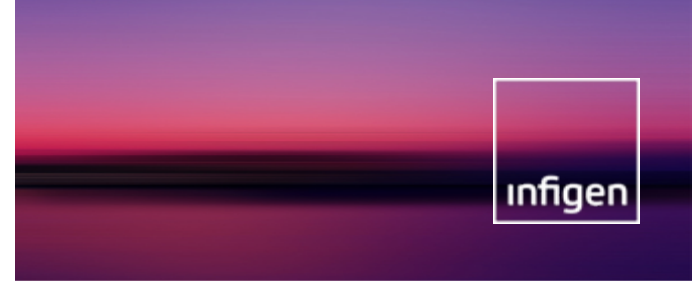
Expirations of the federal PTC in 1999, 2001 & 2003 caused a “boom bust” cycle in the US



- The production tax credit (PTC) is the primary renewable energy incentive
- First Federal PTC passed in the 1992 Energy Policy Act
- Provides a US\$21 per MWh tax credit for the first ten years of operation
- PTC allowed to lapse three times
- Since 2005, the PTC has been consistently extended to provide more even growth

1. American Wind Energy Association Annual Market Report: Year Ending 2009

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# Key Conclusions

## Wind Energy

- Potential to satisfy a significant proportion of LRET
- Likely to dominate new build energy installation
- Expansion of the grid will be required to efficiently satisfy LRET

## Policy Landscape

- LRET improves the prospect of achieving the 20% by 2020 renewable energy target
- The LRET surplus is a critical element in determining investment
- ETS would prove further uplift to renewable energy investment

## Market Dynamics

- Limited in-house capacity of REC liable parties to deliver their mandated requirements
- Steep ramp up profile of LRET and significant lead time to complete renewable energy plants requires commencement of projects now

# Questions





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