

RiAus "Thinking Critically for Sustainable Energy #2

11 August 2010 - Adelaide

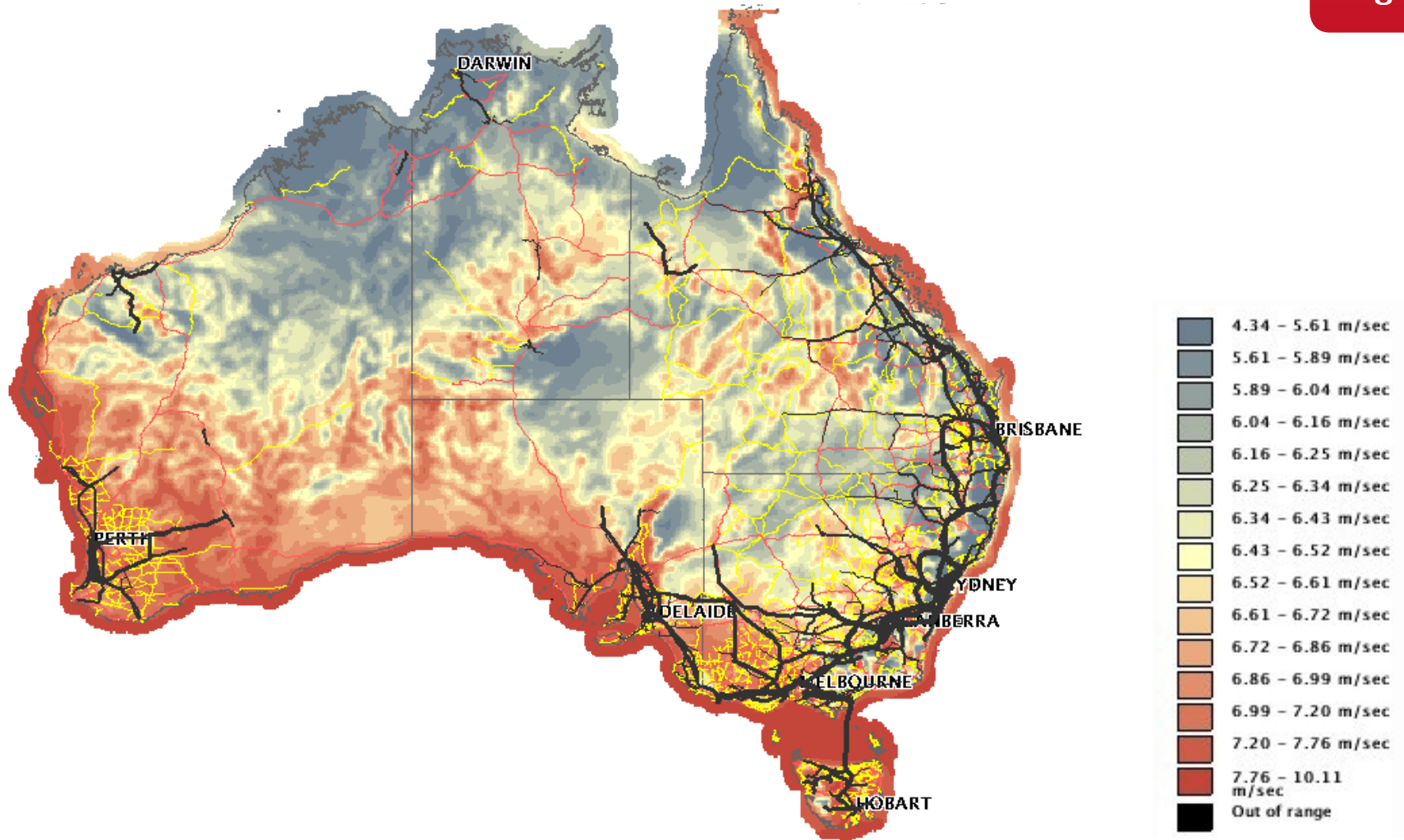


Andrew Stock  
Executive General Manager  
Major Development Projects

*Established  
renewables*

Together we can  
make a difference.™

Australia has a world class wind resource available...



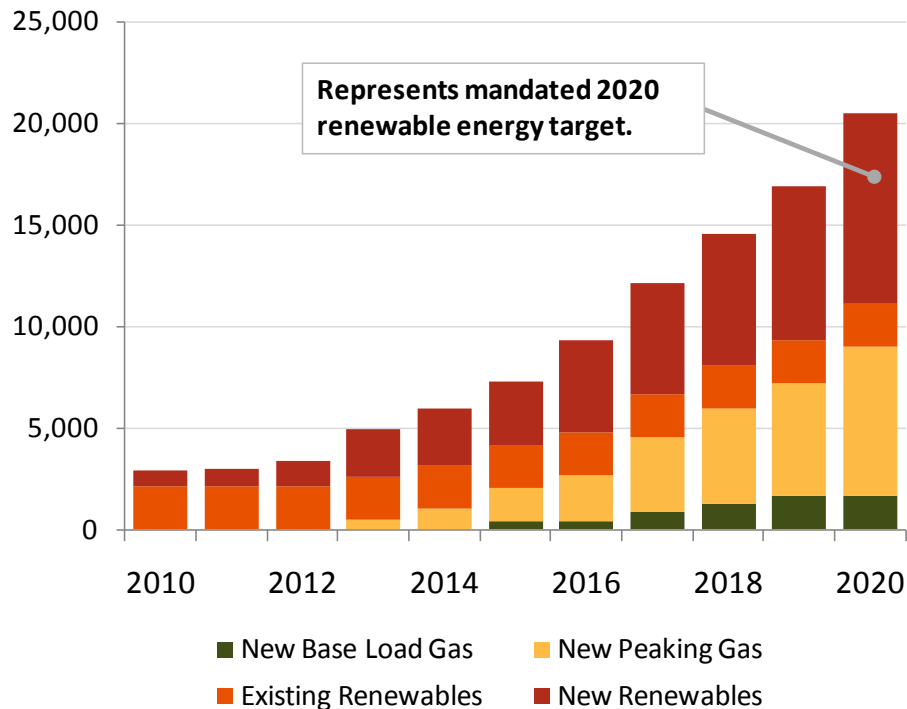
...but it doesn't necessarily coincide with the existing electricity infrastructure.

# Renewable Energy Target means renewables will supply most of the increased demand for electricity over the coming decade (together with gas-fired peaking plant)



## Forecast additional generation required to meet demand in the NEM (MW)

(MW)



- Over 7,000 MW of new wind capacity by 2020 to meet the RET
- 7 x 100MW wind farms installed every year on average
- At an investment of \$15-20 billion
- Gas fired peaking generation will play a key role in balancing intermittency
- New transmission needed to bring wind to market
- Where will the resources come from: equipment, people, funding?

Source: Origin forecast based on AEMO's SOO 2009 demand data

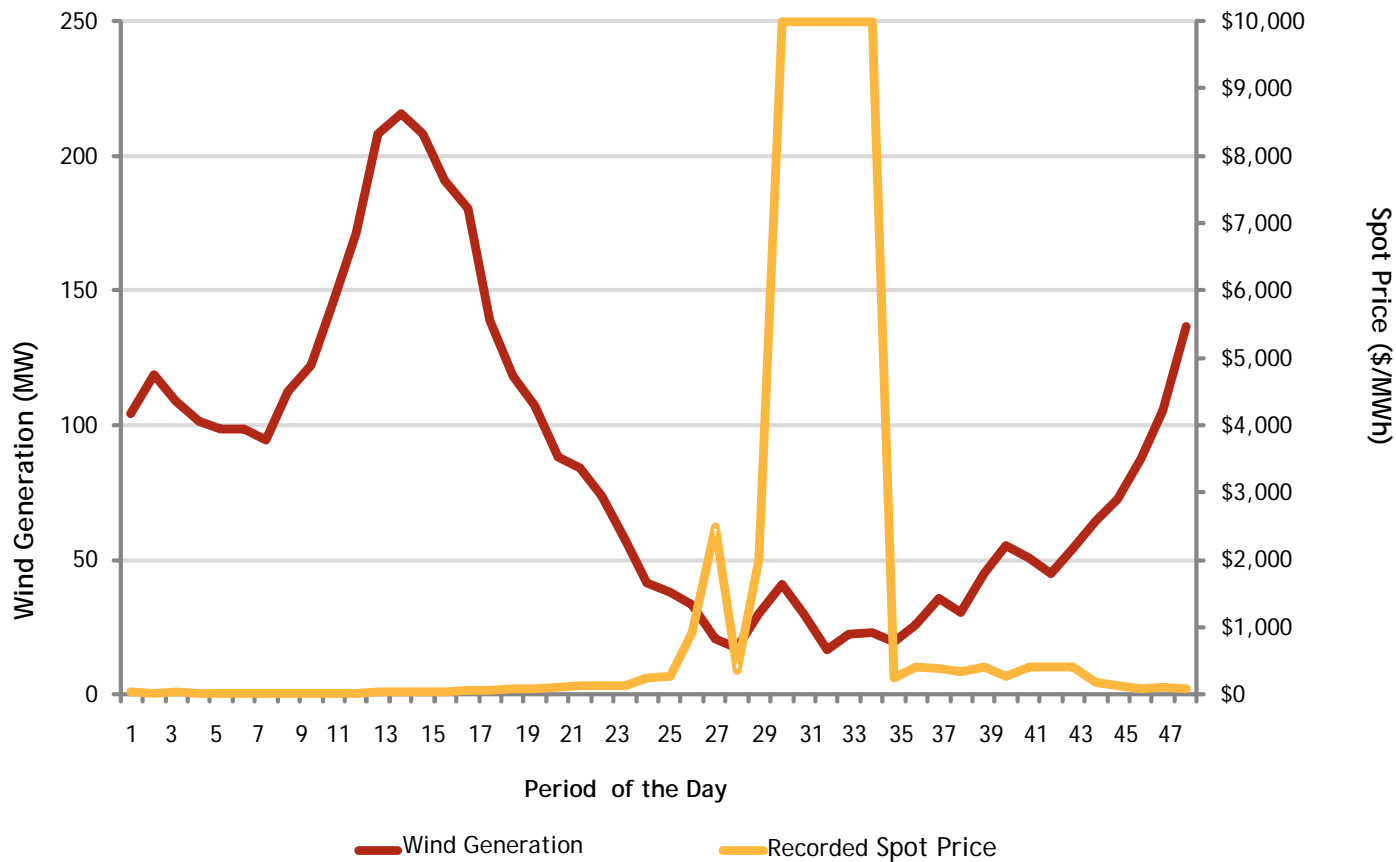
Notes: Excluding non renewable plant currently under construction

But...during extreme weather events, wind cannot be relied upon to deliver supply...



### Impact of wind in SA on hottest recorded day

Wind generation MW, Spot Price \$/MWh

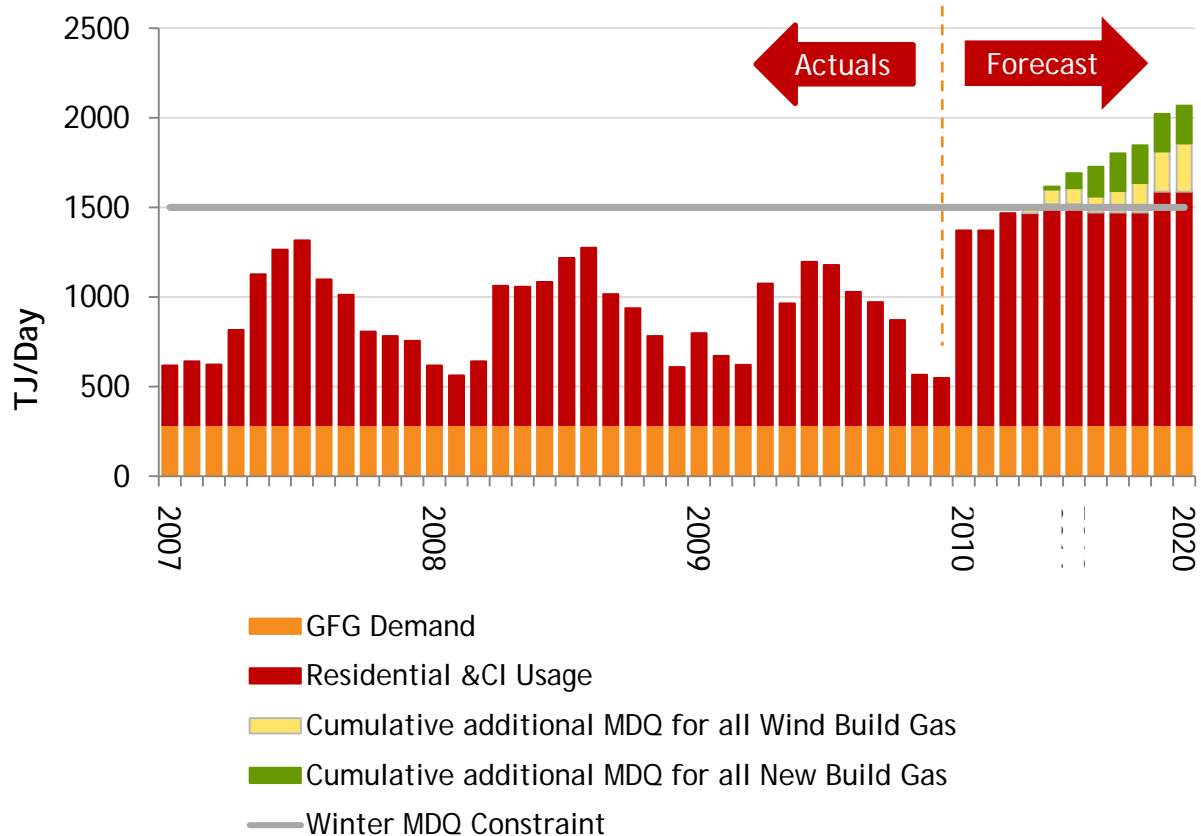


Source: AEMO

# ....Increasing demand for gas-fired peaking generation and gas supply infrastructure to ensure supply



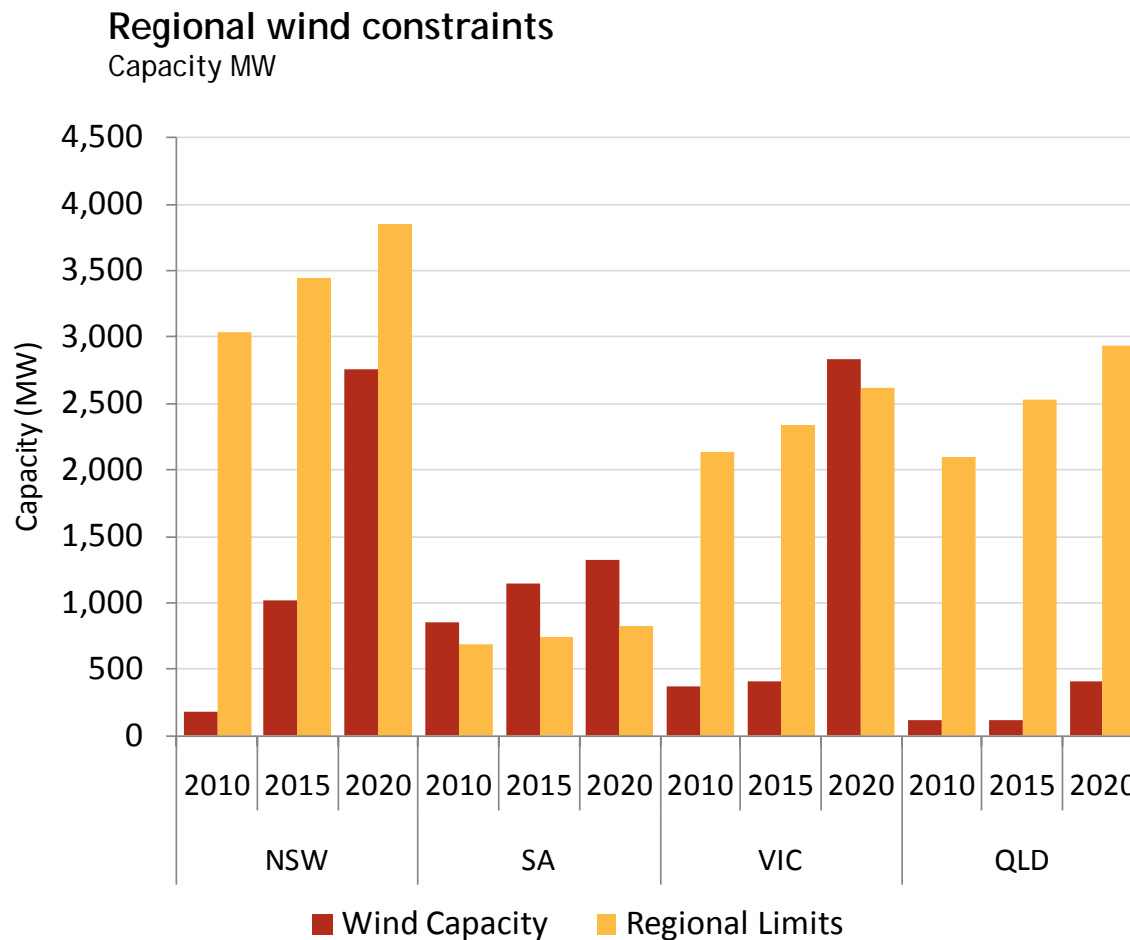
## Victorian Gas System Constraints



- The pattern of investment in gas production, storage and transmission will change
- Origin estimates an additional 500TJ of gas delivery capacity is required in Victoria alone

Source: Internal modelling with reference to GSOO 2009

As major undeveloped wind resources are distant from existing infrastructure, significant growth in wind also demands major transmission links and upgrades

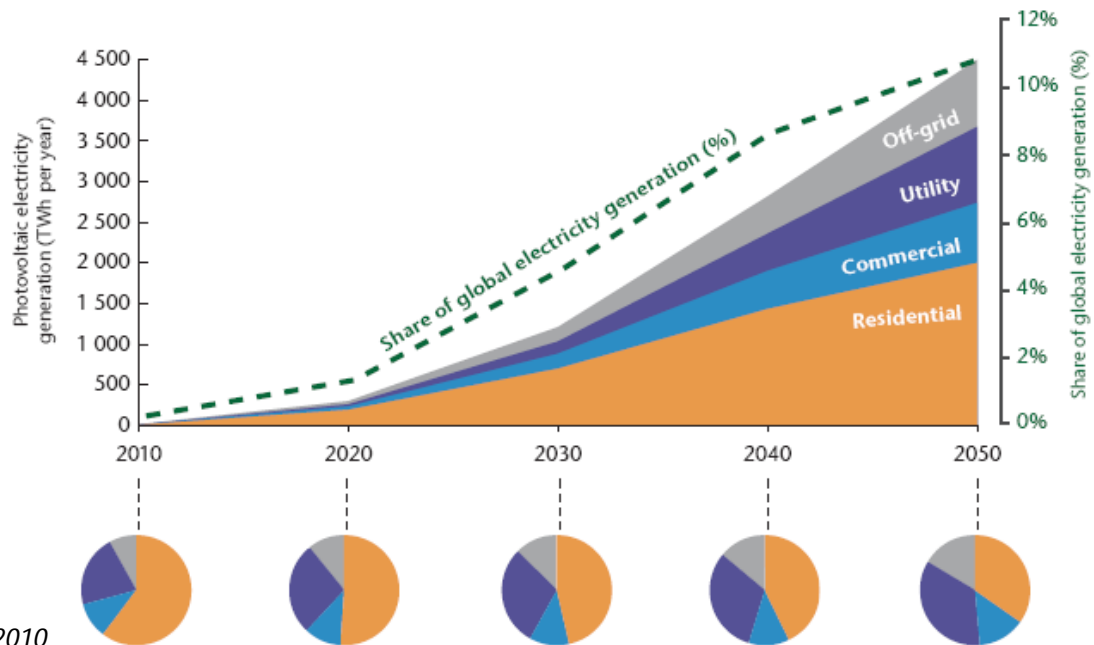
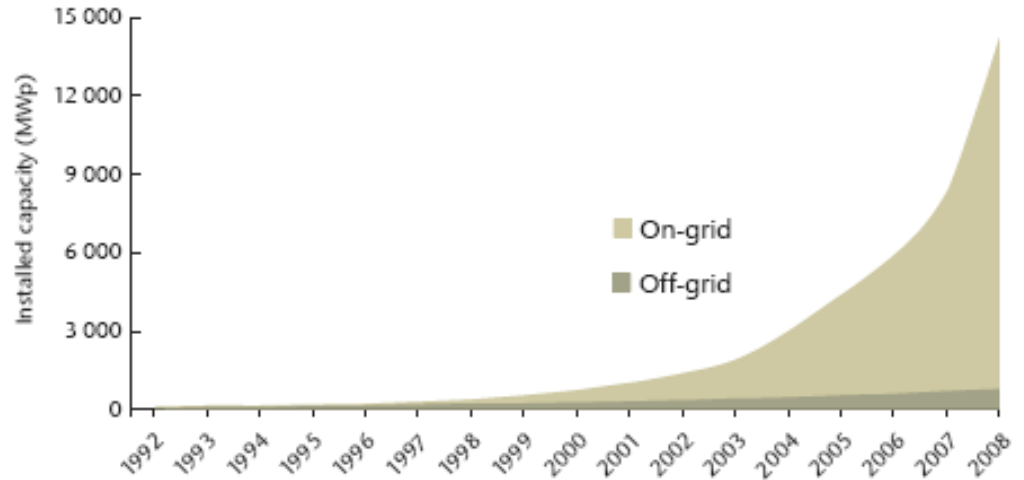


- Without significant network augmentation the NEM will become wind constrained by 2020.

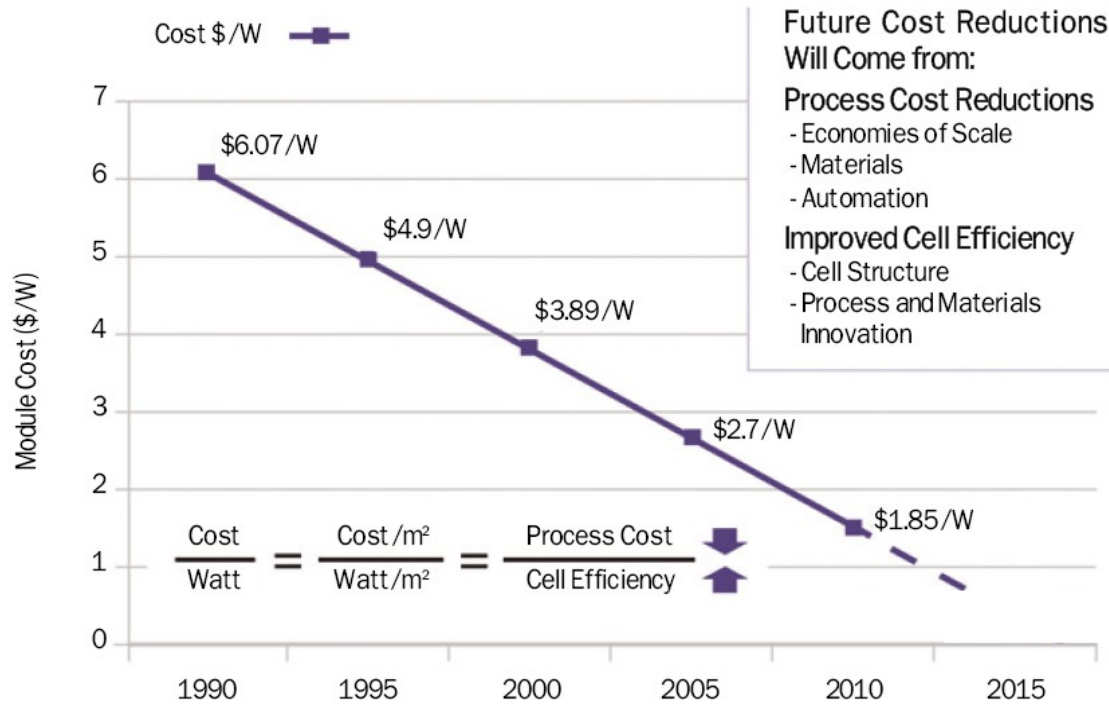
Globally, installed capacity of PV has doubled every 2- 3 years for the past two decades, but today only constitutes around 1% of global generation



- PV market historically was off-grid and roof based
- Today, utilities are increasingly investing in large MW scale PV 'parks'
- PV industry growth accelerated with Feed in Tariff policy support in Asia & EU countries



# Accelerating growth has halved historic costs for PV modules each decade.



Source: SEMI PV Group  
USD/W, 2010

- Delivering decreasing costs due to manufacturing scale economies
- Increasing cost competitiveness with conventional grid supplied power

The IEA sees total delivered cost of PV electricity reaching grid parity over the next 10 years in many countries

Internationally, Concentrating Solar Power (CSP) has seen a resurgence - driven by favourable policy support - but is still expensive compared with PV



- Industry consolidation and supply chain integration are good for the technology's credibility
- How solar thermal can complement gas fired and geothermal generation is of interest to a number of players

