

Snapshot Australia Regulatory Frameworks Driving Australian Clean Energy Market

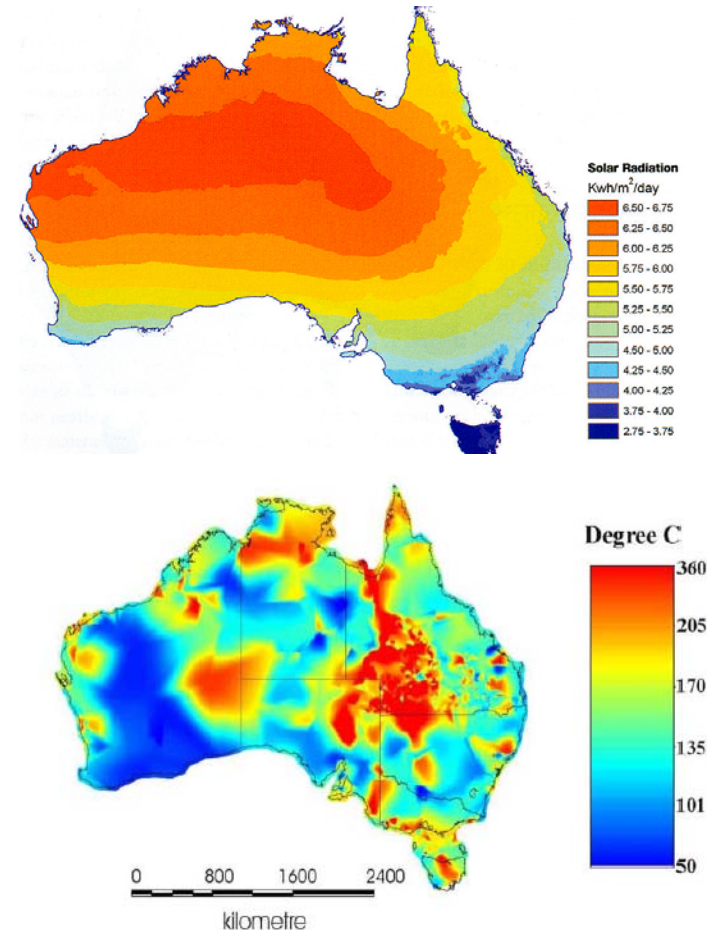
Clean Energy Expo Asia 2010
Singapore
3 November 2010

Paul Curnow, Partner
Sydney

Australia's renewable energy resources

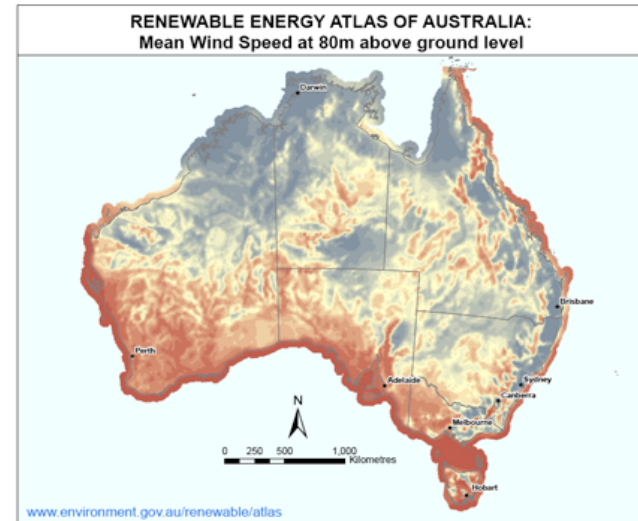
Solar Resources

- Highest average solar radiation in the world
- Large amounts of open land area
- 100MW Solar PV
- World leader in dye solar technology

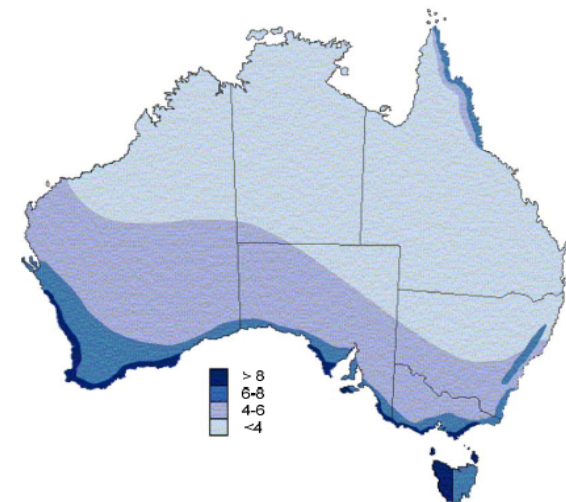


Wind Resources

- Strong wind resources
- 47 wind farms with capacity of 1,476MW
- 6,000MW large scale wind projects proposed

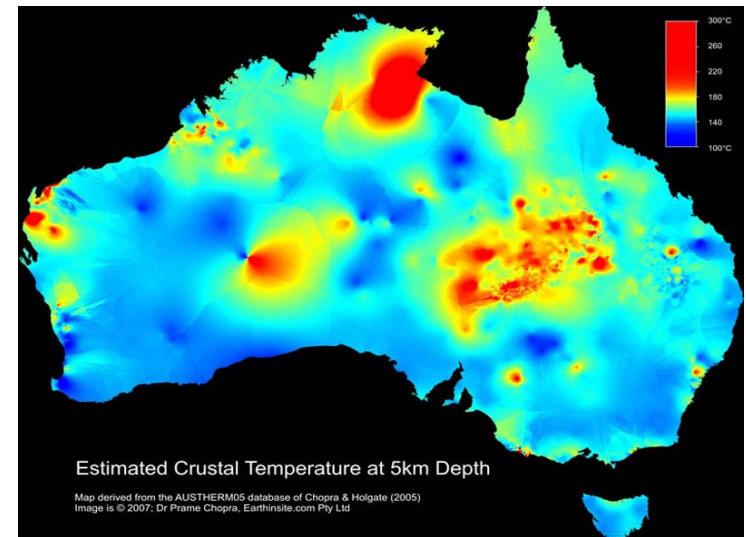
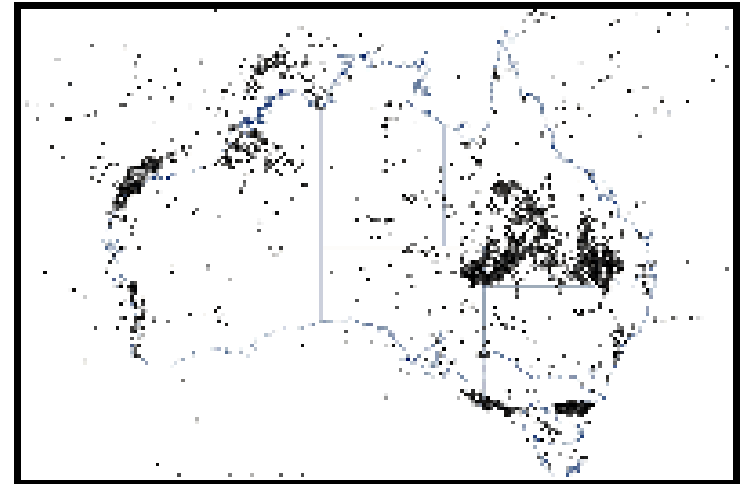


Average wind speeds (metres per second)



Geothermal Resources

- Vast 'hot dry rock' resources
- Potential resource for electricity consumption for 450 years
- Baseload and peaking capability
- High availability factors



Other Resources

Wave

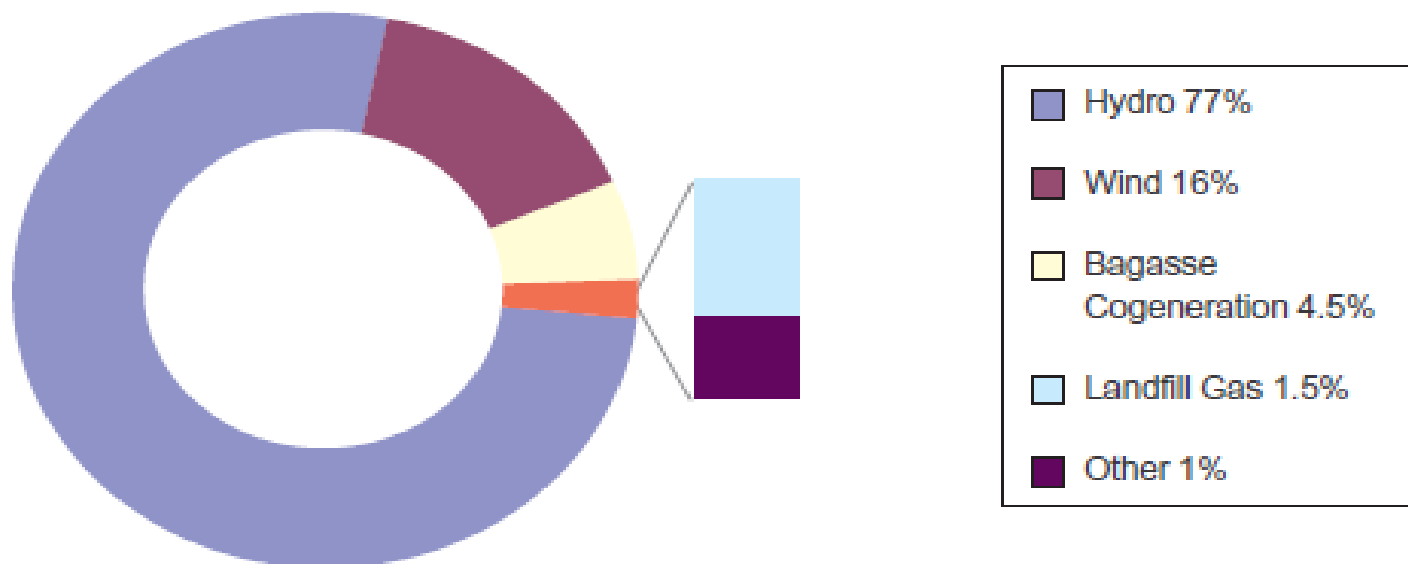
- Relatively undeveloped
- 1 operating generator (0.5MW), 1 generator currently being built (0.1MW)
- Southern Ocean is the largest wave energy resource in the world – potential to generate 35% of baseload power needs
- Particularly SA, Victoria, WA and NSW

Biomass

- Installed capacity of 765MW
- Lead by bagasse cogeneration
- Large land mass = abundant resources of non-food stocks
- Six plants commissioned in 2009 and 7 under construction = 101.52MW
- Potential capacity of 1845MW by 2020



Australia's Clean and Renewable Energy Market



Source: CEC 2009, p.5.

- Renewable energy accounted for 5.8% of total energy generation
- 20 new renewable energy projects commissioned in 2009

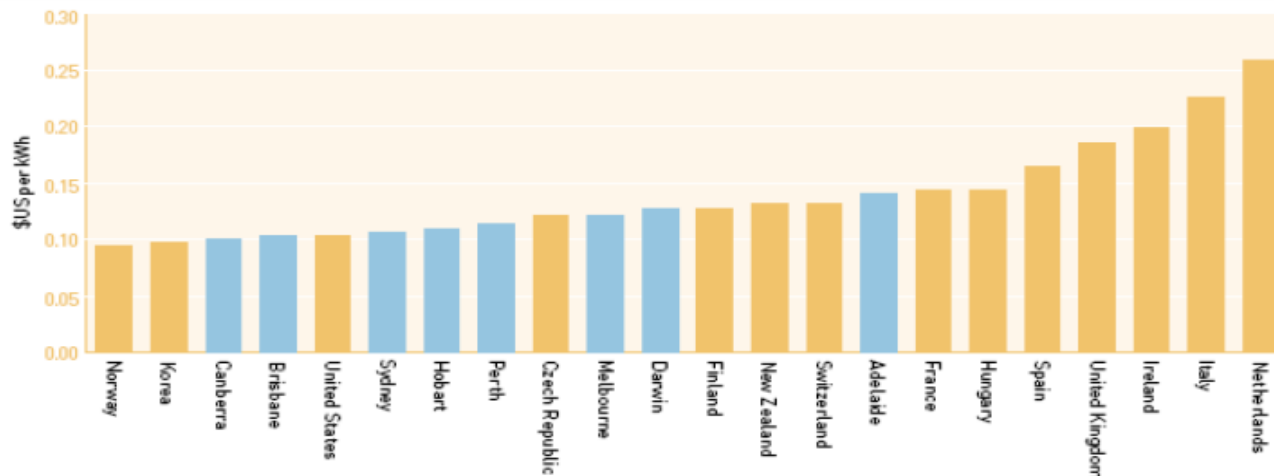
Policy Driving Growth in Renewable Investment

Main Policy Drivers (1)

- Over-dependence on fossil fuel – 85% of electricity from coal & gas
- Carbon target = -5% below 2000 levels by 2020
- Strong RE resources – credible to support large-scale RE generation
- Price of electricity cheap among OECD countries – cost of generating electricity from RE not competitive in comparison to coal/gas – need for financial incentives

On average, electricity prices in Australian capital cities are lower than in many OECD countries.

Figure 4 : How Australian Capital Cities Compare - International Electricity Prices for Households, 2006



Main Policy Drivers (2)

Federal

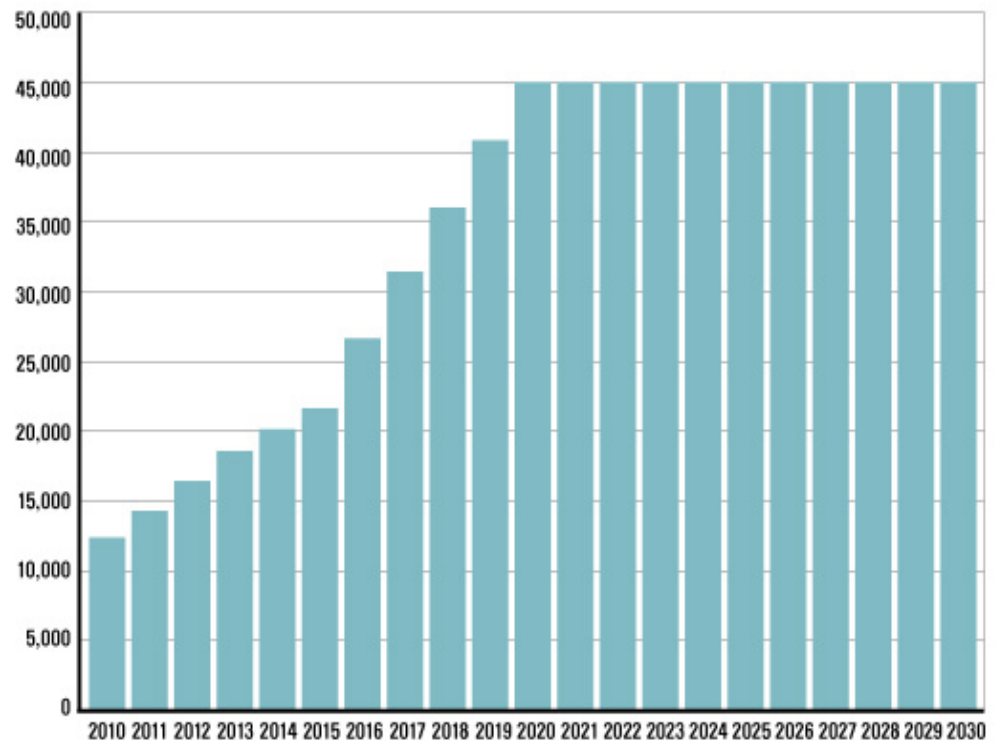
- **Main policy = Expanded 20% RE Target**
 - Large scale renewable energy target
 - Small-scale renewable energy scheme
- **Targeted grant funding**
- **Expanded \$5.1 billion Clean Energy Initiative**
 - \$652.5 million Renewable Energy Future Fund
 - \$1.5 billion Solar Flagships Program

State

- **Feed-in tariffs** – but only small-scale
- **Streamlined planning and approvals**
- **Targeted grant funding**
 - Solar Flagships co-funding
- **Other policies?**
 - FIT for large-scale solar?

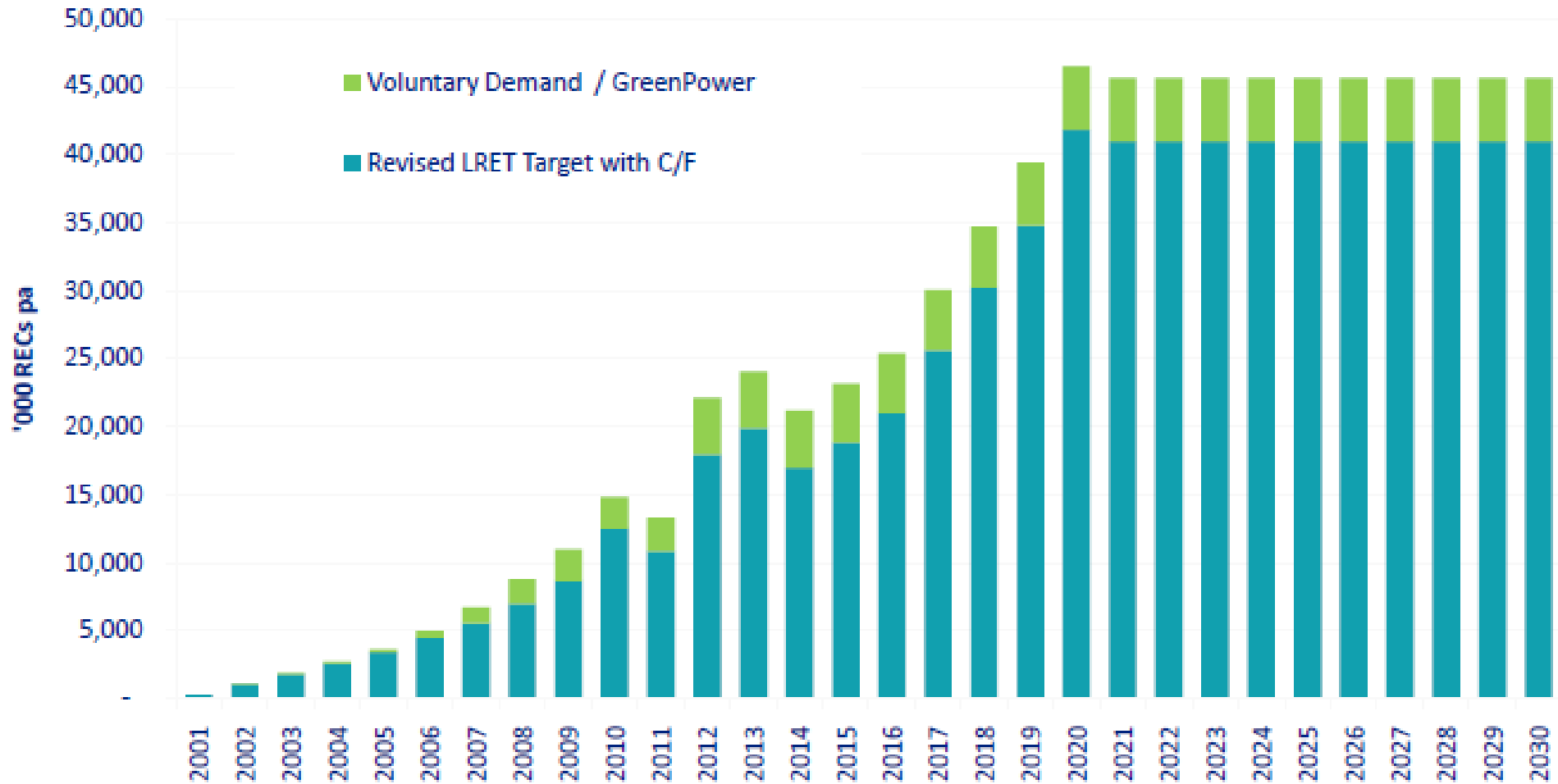
Expanded Renewable Energy Target

- RET scheme was expanded in August 2009
 - to require an additional 45,850GWh of electricity to be generated from renewable resources
 - ensures $\approx 20\%$ of Australia's electricity is generated from renewable energy by 2020.
- Solar water heater & residential installations eligible.



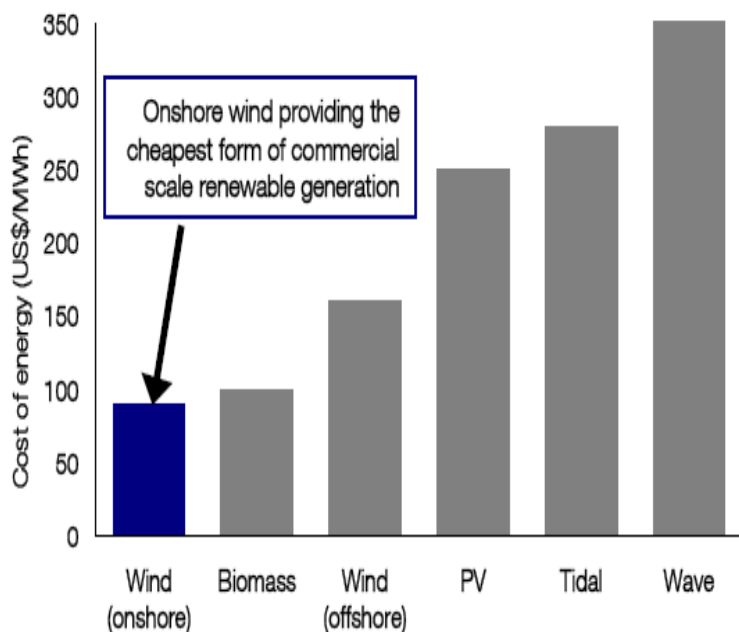
Expanded Renewable Energy Target Trajectory to 2030
Source: Commonwealth Government

Large-Scale Renewable Energy Target



Policy Results (1) – Wind Main Beneficiary for Large-Scale

Estimated Cost of Producing Electricity (by Generation Type)



Source: New Energy Finance: Levelised Cost of energy Outlook (October 2009)

Technology	Advanced Projects		Less Advanced Projects	
	Number	Capacity (MW)	Number	Capacity (MW)
Non renewables	9	2,696	47	18,084
Renewables:				
Wind	8	733	71	10,672
Hydro	1	140		
Biomass			2	240
Geothermal			2	80
Solar			2	102
Wave			3	786
Total renewables	9	873	80	11,880
Overall	18	3,569	127	29,964

Source: McLennan Magasanik Associates

Solar Flagships Program

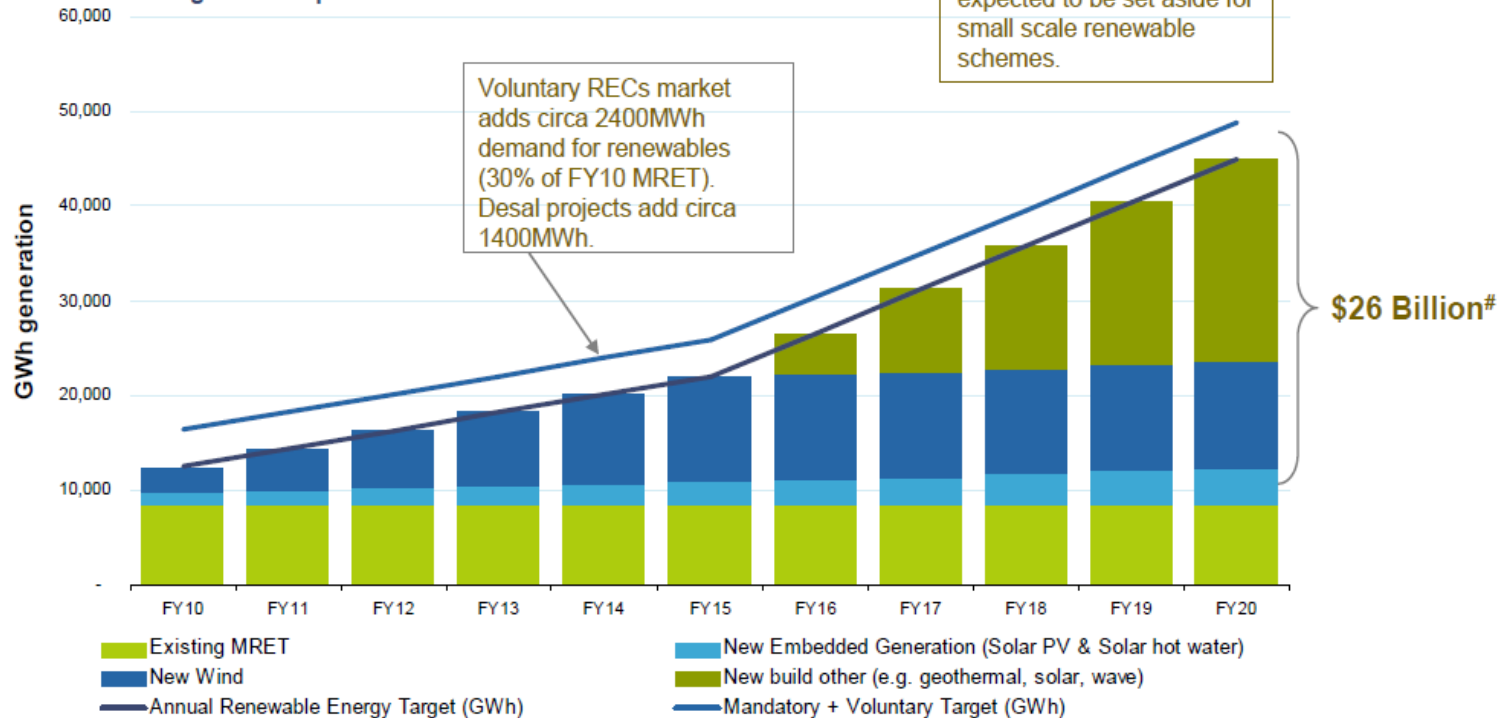
- \$1.5 billion to support the construction and demonstration of up to 4 large-scale solar power plants:
- Round 1 (2010/11) = 1 solar PV & 1 solar thermal
 - 8 Shortlisted applicants recently announced
 - 4 solar thermal, 4 PV
- Round 2
 - 2 further projects – either solar PV and/or solar thermal
 - To open in 2013/14 after the outcome of the first selection round is reviewed

Investment Opportunities in Australia

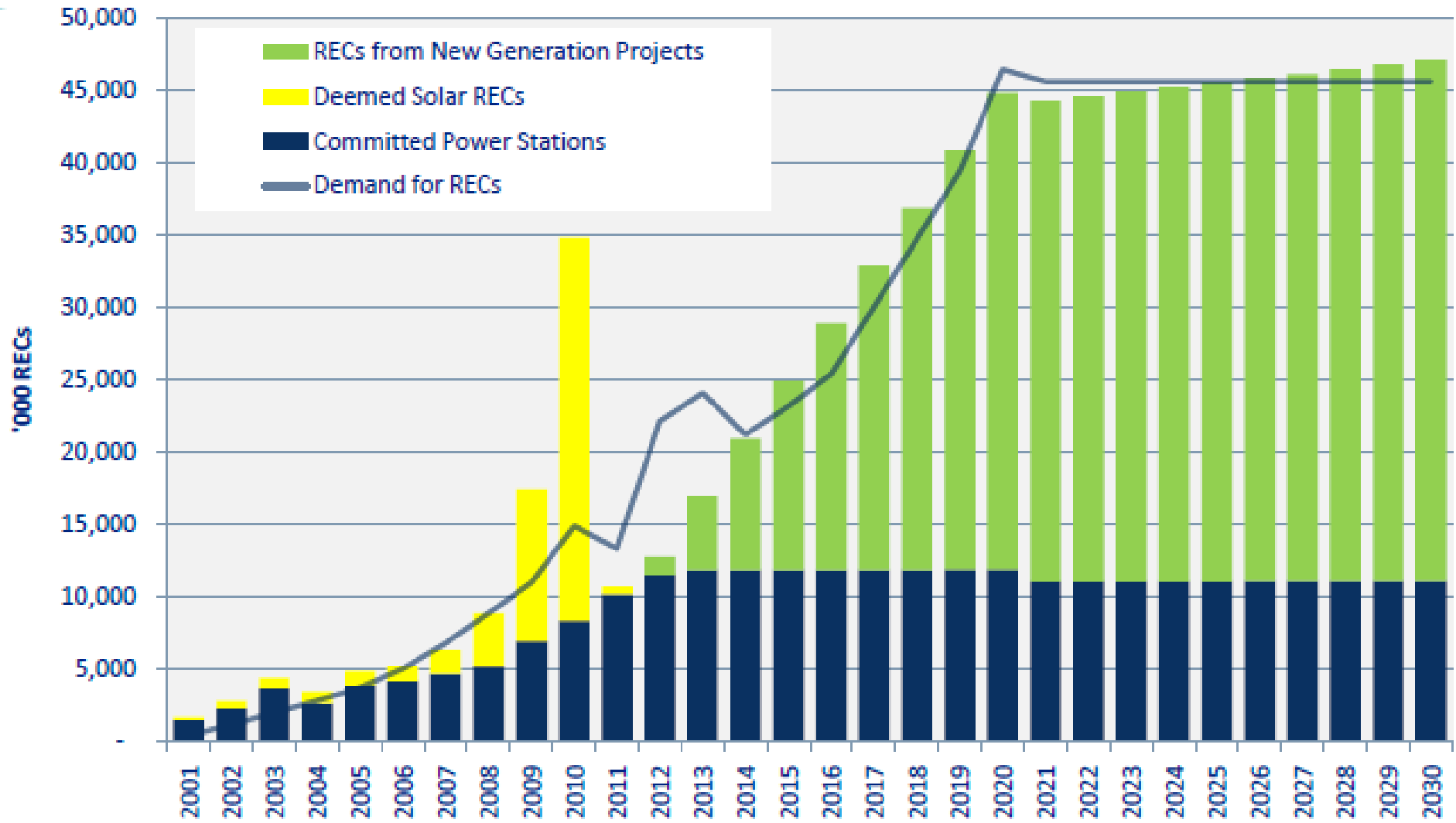
Renewables Financing Opportunity...

- \$26 billion capital requirement to reach 20% target
- approx. 10,600 MW of RE currently installed (approx. 310 projects > 100kW)
- 6000 MW in pipeline at various stages
- 6000 MW greenfields

Renewables target and expected source

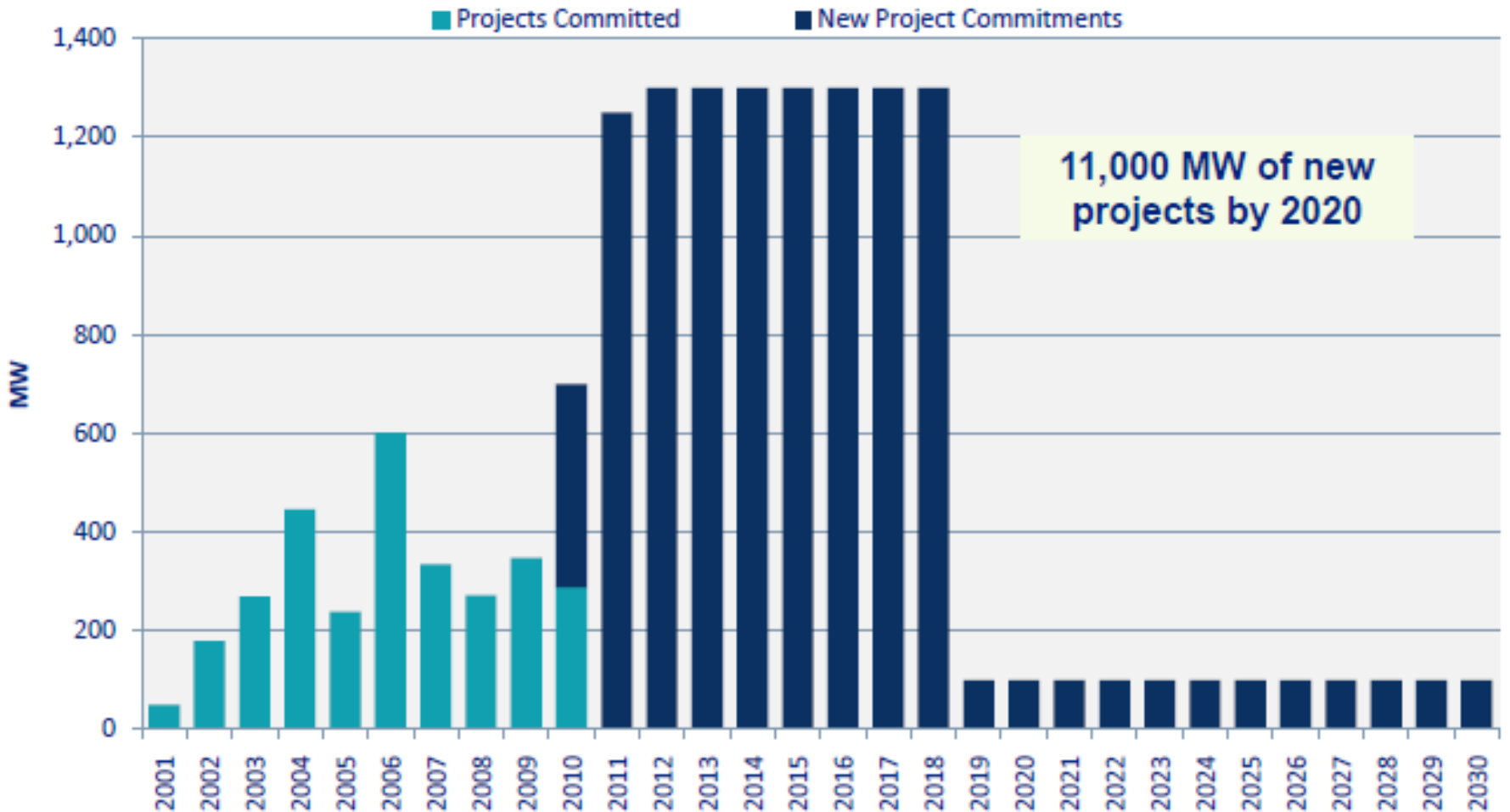


Forecast Demand for RECs...



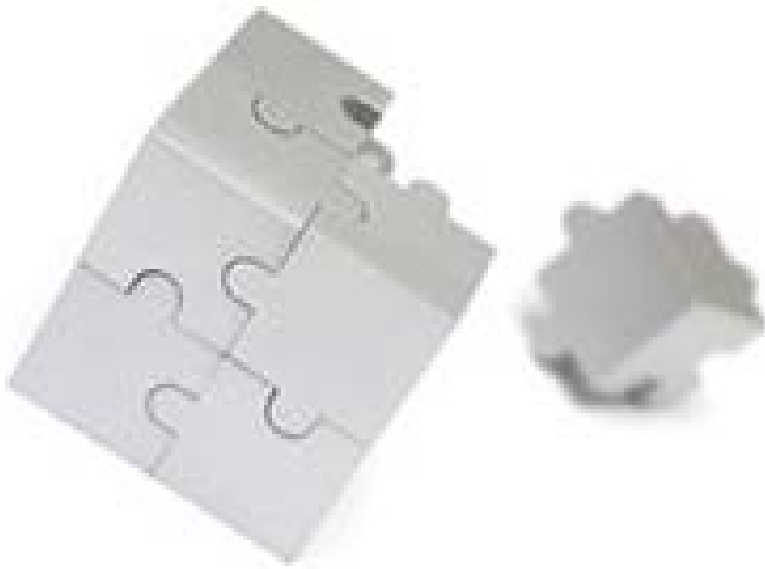
Regulatory frameworks driving Australian clean energy market

11GW New Installed Capacity by 2020...



But some pieces of policy puzzle still missing

While the Federal Government has proven a constant determination to correct defects in their policies, some pieces of the puzzle are still missing...



- A carbon price?
- Transmission infrastructure costs...
- Finding a PPA...
- Regulatory support for large-scale solar...
- Finding early stage financing...
- Uncertainty of State-level feed-in tariffs for small-scale systems

Thank you

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