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Australian Solar Thermal Energy Association Ltd

Concentrating Solar Thermal – High value, dispatchable energy

High value peak output

Dispatchable, firm capacity

Commercially mature, utility
scale energy storage

Australian industry potential

High value solar fuels



ARENA National Consultation Forum, Melbourne 21 August 2012

Andrew Want, Chairman, AUSTELA

Preparing for a 'very different energy future'*

Australia's generation fleet will be replaced by 2050

- 80% GHG reduction target requires zero-carbon stationary energy sector

In this very different, imminent future

- 'Firm capacity' (dispatchability) will replace the concept of 'base load'
- Energy storage will be integral to the system, enabling the most efficient network configuration
- Utility scale thermal energy storage will be a key element

CSP will make a major contribution to lower electricity prices

- Challenge is to deliver the most cost-efficient electricity system, not just lowest LCOE for generation
- CSP answers many of the pressing challenges in this transformation

*Australian Energy Technology Assessment,
BREE, July 2012

CSP is the right technology to be supporting now

CSP's versatility provides important options and global opportunities for Australia

- High value peak output to meet peak demand, reduce network constraints
- Dispatchable, firm capacity – power when the market and network most needs it
 - Commercially mature, utility scale energy storage is available today
 - Hybrid versatility (CSP/gas, CSP/biomass, fossil/CSP-boost) provides flexibility
- Thermal inertia inherent in CSP – stable, reliable output in the 'renewable intensive' grid
- Genuine opportunity for Australian CSP industry to compete internationally
- High value solar fuels – an Australian solar energy export industry to power the 'Asian Century'

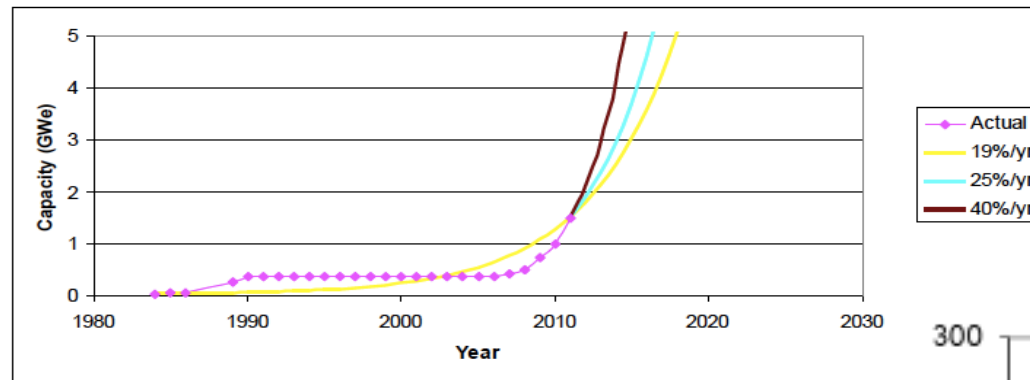
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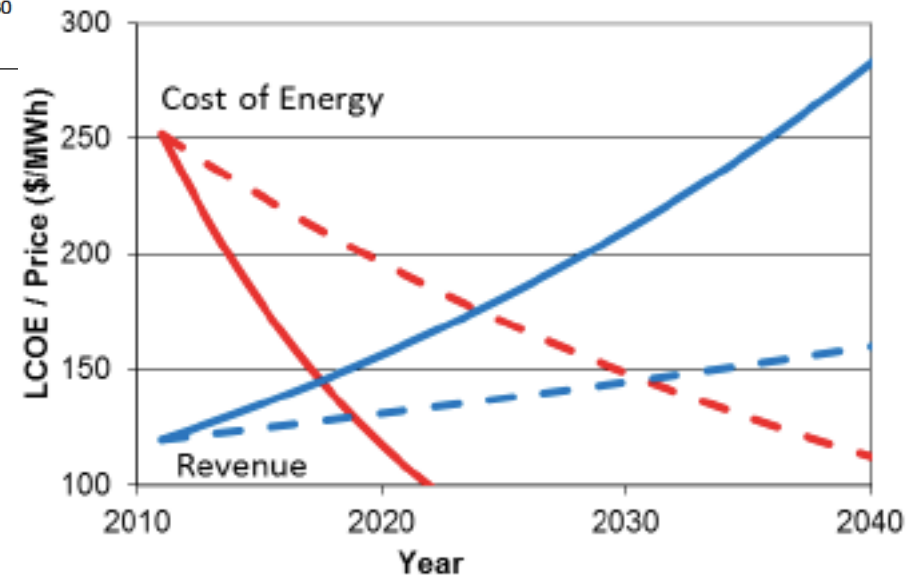
Australian can contribute to, and benefit from, global CSP growth

CSP growth is accelerating, rising to 40% pa since 2007 ...

Figure 2: Global installed capacity of CSP plants to end of 2011.



...and the revenue/cost gap will close with deployment



Source: 'Realising the Potential for CSP in Australia', 2012

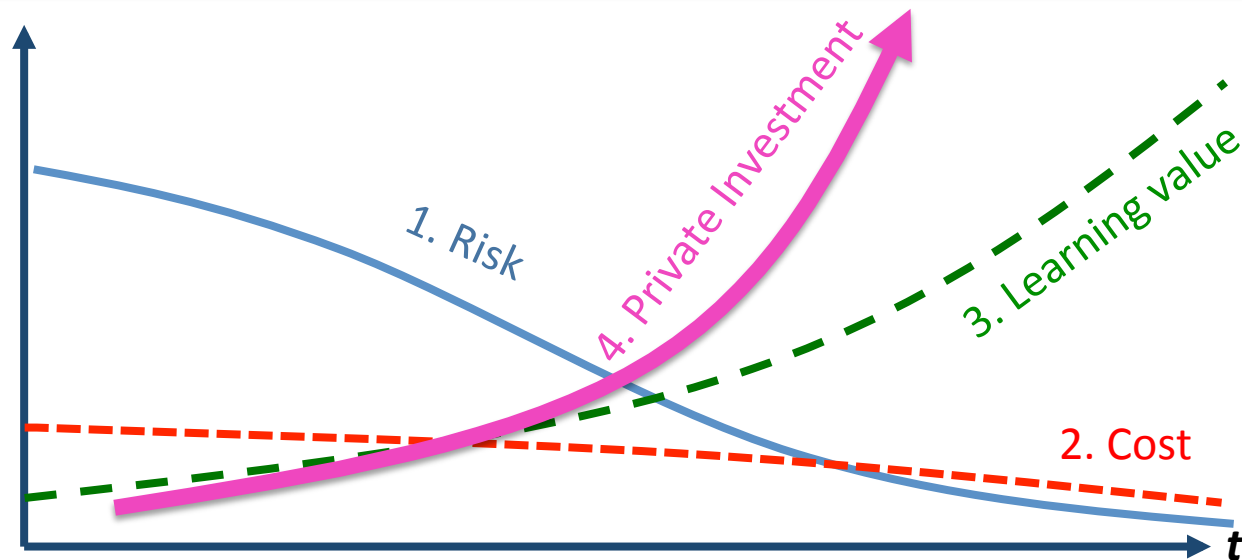
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Staged program structure, market segment focus = improved ROI

1. Risk reduces
2. Cost reductions leverage program investment
3. Industry learnings and capability increase
4. Private capital inflow increases as risk reduces



		Year 1	Year 2	Year 3	Year 4	Year 5
Payments based on output delivered	Utility scale	4 projects 20-50MW	3 projects 2x50MW 1x100MW	2 projects 1x50MW 1x100MW	2 projects 1x100MW 1x250MW	2 projects 250MW
	Mining/Off-grid	5 projects 2-5MW	3 projects 1x2MW 2x5MW	2 projects 1x5MW 1x10MW	2 projects 1x10MW 1x20MW	
Lump sum grants	Pilot/demo	Open for applications at any time for projects 0.5MW-2MW Higher technical risk/innovation				

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Summary: Program design to drive sustained private investment

1. Clear objectives, stable program, defined period
 - An investment path for project developers, investors and financiers
2. Structured to deliver a range of projects
 - Scale tailored to address identified market segments
 - Program investment spread over time
3. Facilitate project finance – revenue certainty for output delivered
 - Payments based on value of energy delivered (not just cost)
 - Structured to drive cost reductions through life of the program

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CST technologies



Parabolic trough: >90% of global CSP ~2011



Central receiver 'power tower'



Compact Linear Fresnel



Parabolic dish