



Australian Government
Australian Renewable Energy Agency

Large-scale Solar in Australia: Past, Present and Future

Matt Walden - ARENA Investment Director

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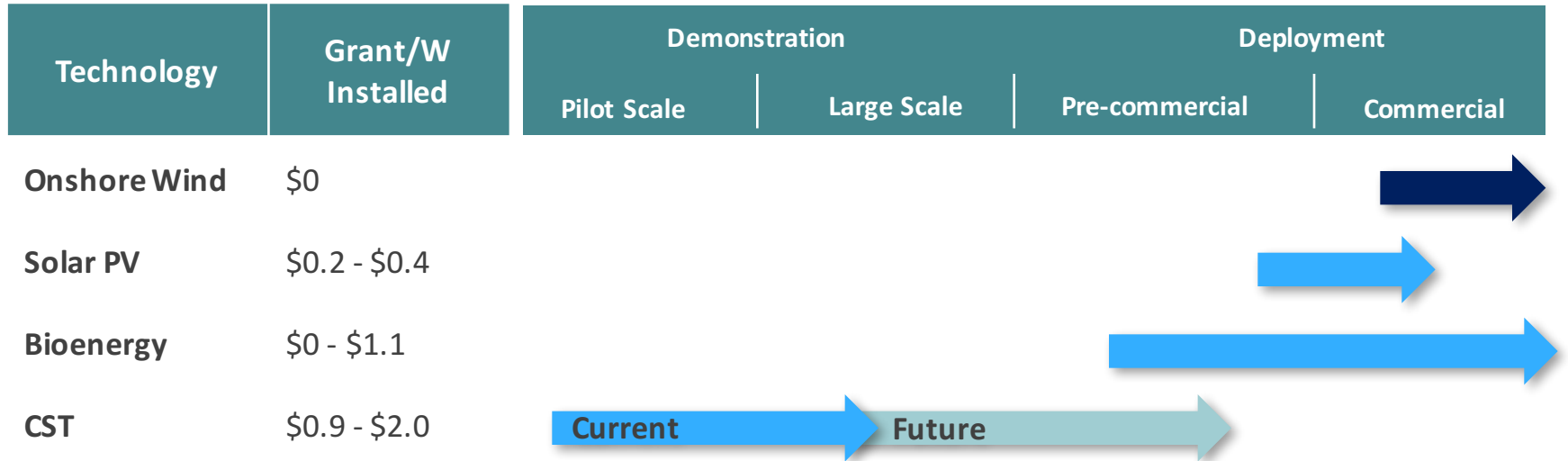
ARENA

Innovators and imitators, the maturing large-scale solar market in Australia

1. Where is large-scale solar today in its path towards parity?
2. What has been done to bring down the cost?
3. Challenges and opportunities for large-scale solar in Australia
4. How has the landscape changed?

What are some of the things you see in a maturing market? Are we now seeing them in the large-scale solar market in Australia?

Solar PV is bridging the commerciality gap and CST is on its way

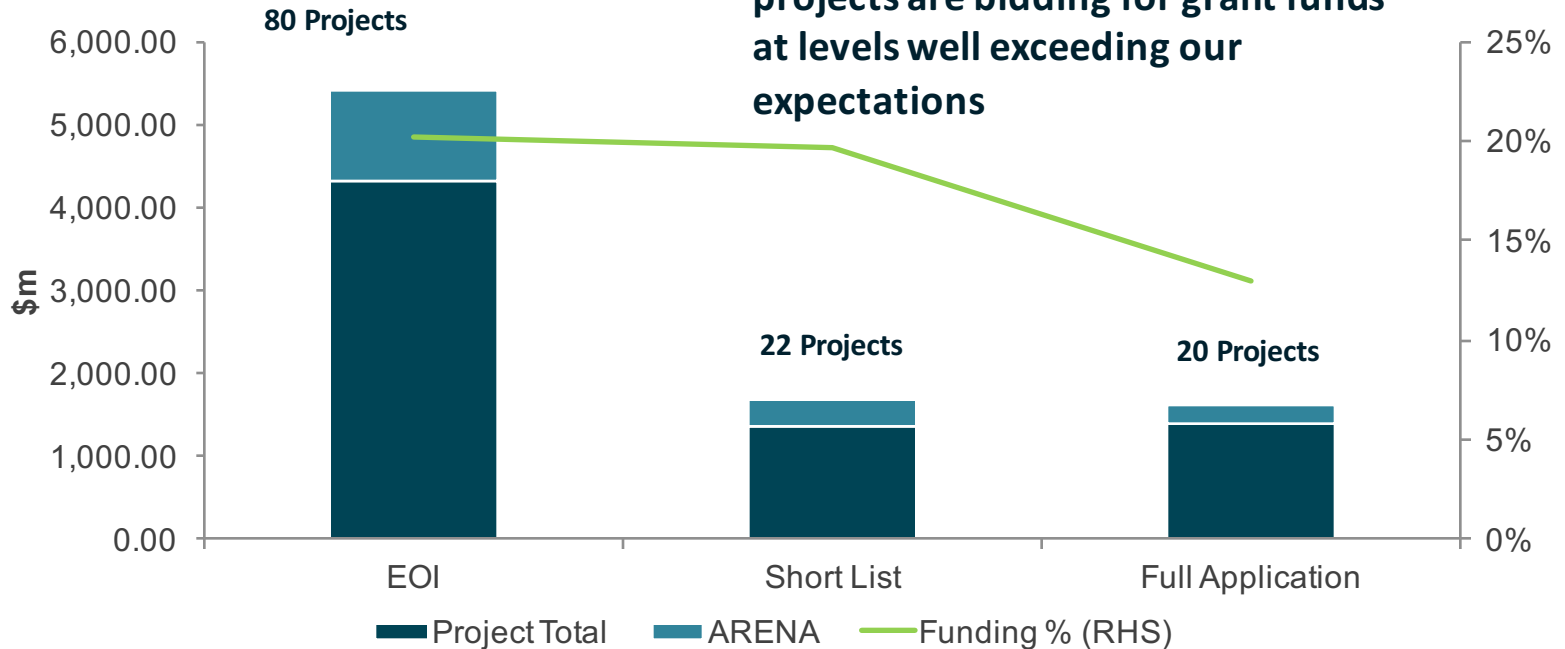


Source: ARENA analysis

Solar PV, Bioenergy and Large CST projects still require grant funding to cover the gap between the cost of the project and the amount of commercial debt and equity the project revenue will support (e.g. CST projects have a capital cost of \$5/W but will only support \$4/W of commercial debt and equity funding; the balance needs to be supported through grants)

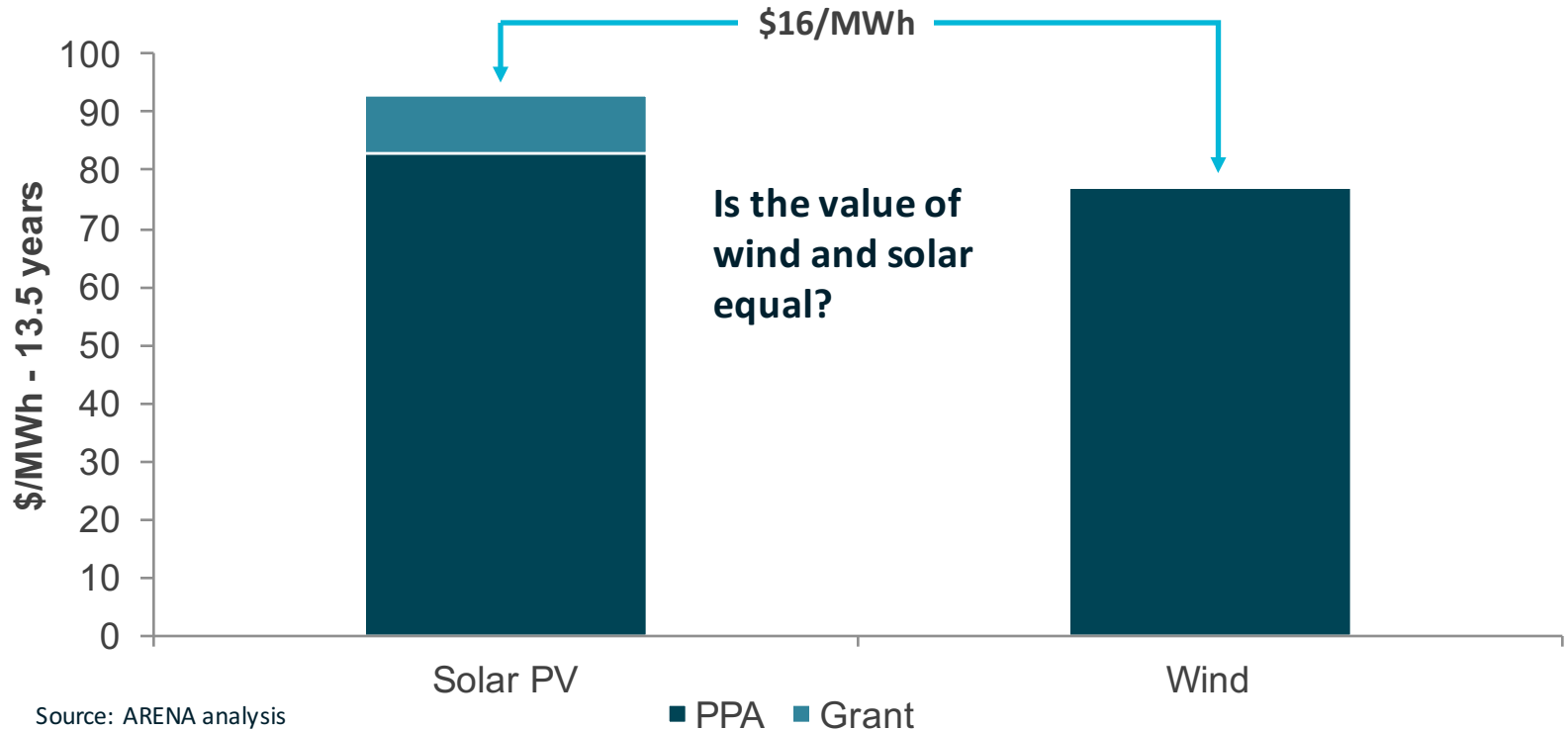
A 33% drop in the ARENA grant ask between EOI and Full Application

Although there is a broad range, projects are bidding for grant funds at levels well exceeding our expectations

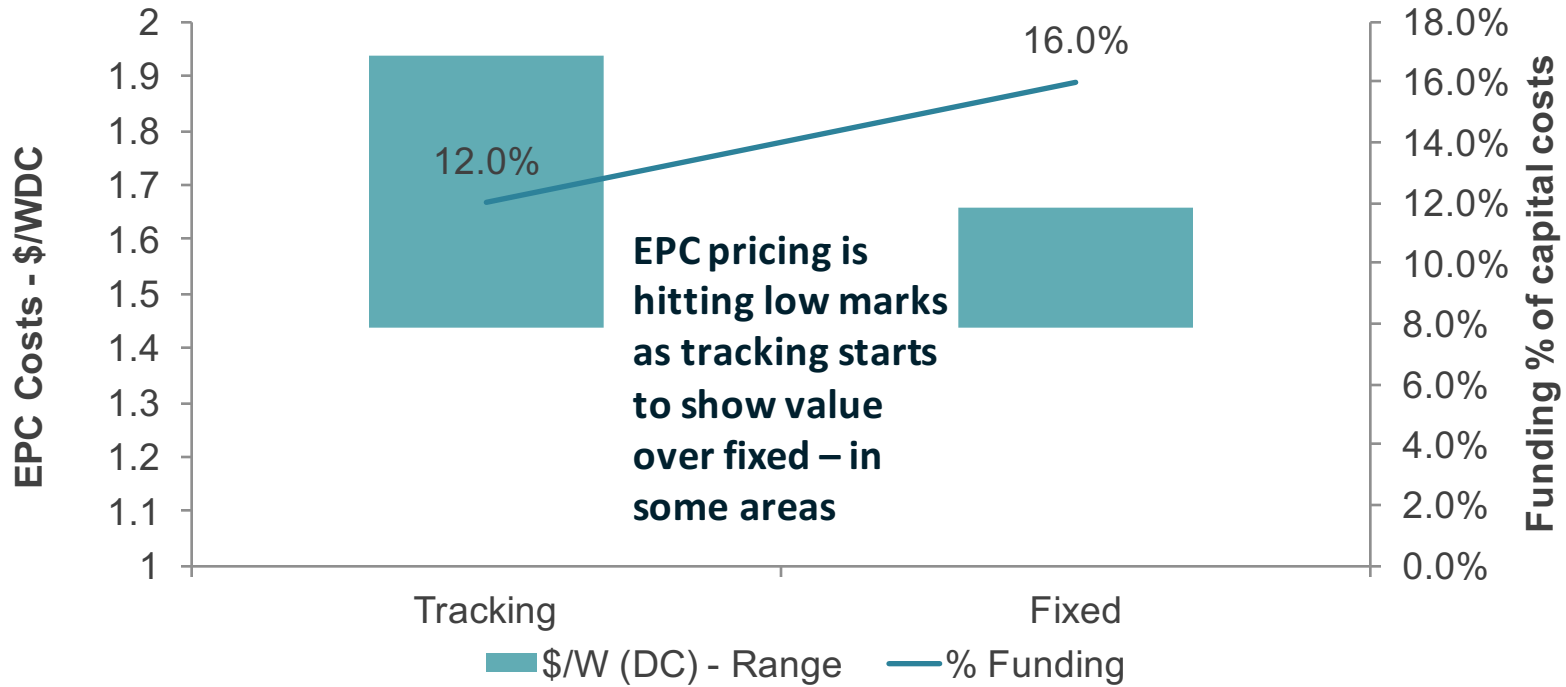


* Expected to be presented for final board approval in September 2016

How do we measure the distance on parity of solar with wind?



Tracking starting to over-take fixed in value for money as EPC pricing firms



What is driving down the cost? – Debt Market

A large driver has been the debt market driving down cost of capital

1. We are now seeing PPA DSCRs* as low as 1.25x
2. Merchant debt now being offered by the large banks
3. Significant interest from overseas lenders
4. Longer tenor and amortisation periods decreasing refinancing risk

What is driving down the cost? – PPA market

It took a while for the first major solar PPA to be signed, but since then, solar's value is being recognised.

1. Average pricing in the QLD and NSW market is around the low 80s
2. WA and SA while pricing is higher, have other challenges to overcome
3. State based procurements and processes are helping

What is driving down the cost? – System Optimisation

Care taken to recognise the pros and cons of a location

1. AC:DC sizing
2. Fixed vs tracking in relation to time of day pricing
3. MLF, DLF and grid connection
4. Module quality and location specific module loss factors

Opportunities and challenges for large scale solar in Australia

Storage

1. Batteries, Hydro, Hydrogen and Solar thermal

Wind and Solar co-location

1. AECOM Study

ARENA's LSS Round

1. Knowledge Sharing
2. NSP exposure to solar projects
3. Increased exposure across the industry

Are we seeing the signs of a maturing market?

The development of the specialists

1. Construction companies now seem to be the winning bidders in the EPC market
2. Increased competition of debt market both local and international
3. Supply chain familiarity with projects and process
4. Increased exposure, experience and knowledge across the industry (advisors, regulators, communities and DNSPs)
5. Competition and appetite for RECs improving



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