

PROGRAM



Australian
PV Association

- 10.55am **Welcome** – Prof George Earl, Bond University
- 11:15am **APVA overview & update on PV markets**
- Muriel Watt, APVA
- 11:45am **Role of solar power & buildings to deliver low carbon living** – Assoc Prof Alistair Sproul, Low Carbon Buildings CRC
- 12:15pm **PV building integration – an architect’s perspective** – Peter Gardiner, Peddle Thorp Architects
- 12:45pm **LUNCH**
- 1:30pm **TRACTILE roof integrated innovation for Australian buildings** – Jason Perkins, Tractile
- 2:00pm **Identifying & removing the complex BIPV integration barriers** – Matthew Sullivan, Moreland Energy Foundation
- 2:30pm **BIPV – International experiences & opportunities for Australia** – Mark Snow, UNSW
- 3:00pm **Discussion**
- What is holding back the BIPV market in Australia?
 - What could be done to accelerate its development?
- 3:30pm Close of workshop
- 3:45pm **Tour** of Bond University facilities



APVA BIPV Workshop

Supported by
Tractile and Bond University

Dr Muriel Watt

Chair, APVA

IT Power (Australia) & UNSW

7th June 2013

The APVA – who we are



Australian
PV Association

- An Association of businesses & researchers with an interest in PV:
 - research, technology, manufacturing, systems, policies, programs and projects.
 - Our work is independent, apolitical and widely used
 - Our objective is:
 - ***To support the increased development and use of PV via research, analysis and information.***
-



What we do

- Education & Information
 - Reports and analyses
 - Events and networking
 - Research
 - IEA PVPS
 - IEA SHC
 - ARENA projects
 - Australian PV Industry Innovation Precinct
-

Global PV Market Development

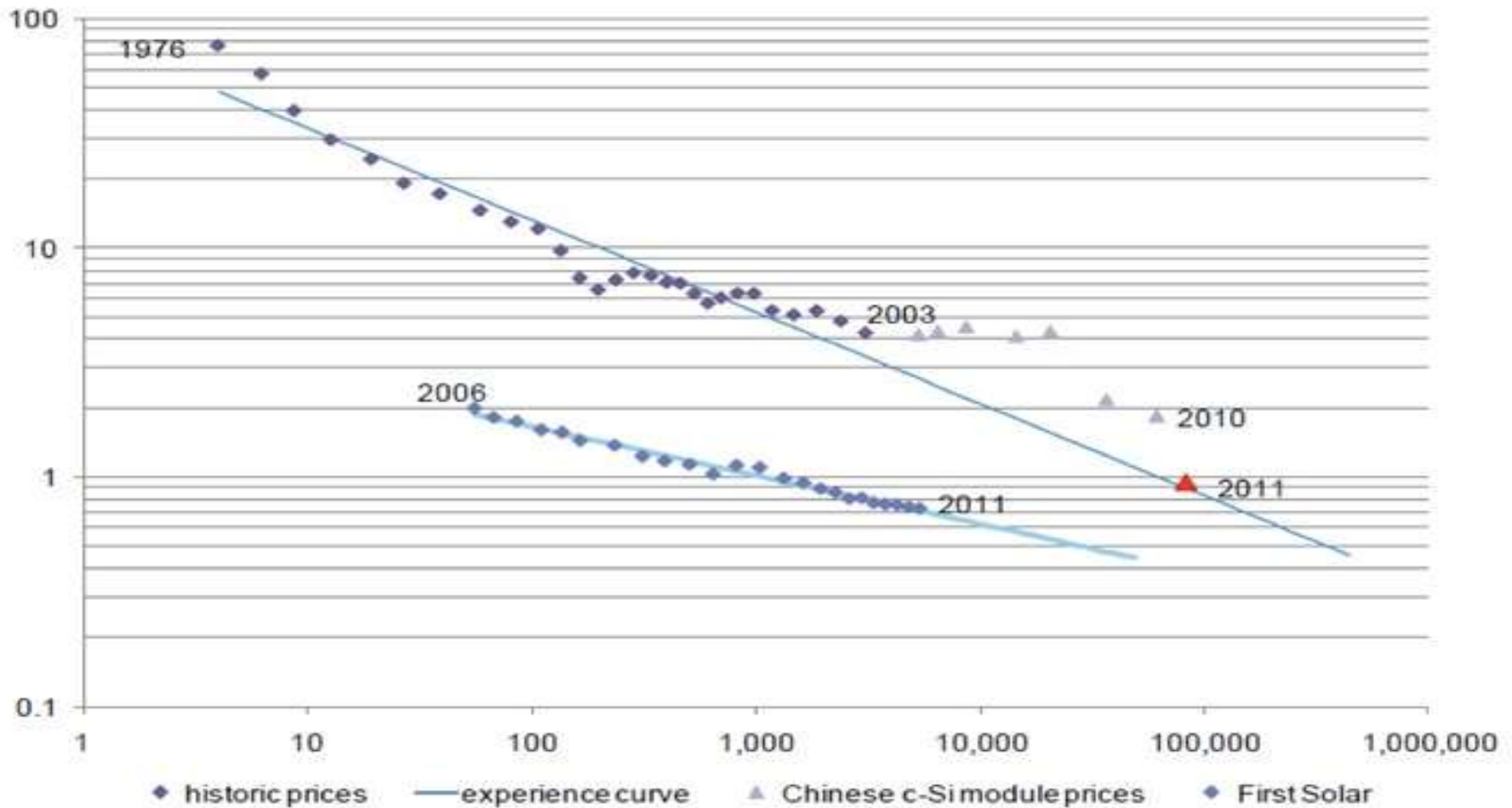


Australian
PV Association

- 8 GW installed in 2009
 - 18 GW in 2010
 - 26 GW in 2011
 - 29 GW in 2012
 - 32 GW projected for 2013
 - Production capacity ~41 GW
 - Installed capacity now > 100 GW
 - C-Si module production costs ~US\$0.53/W_p
 - 230 GW expected to be installed 2013-2017
 - 10% of world's electricity projected by 2020
 - NREL target - installed cost US\$1/W_p
-

Module price trends

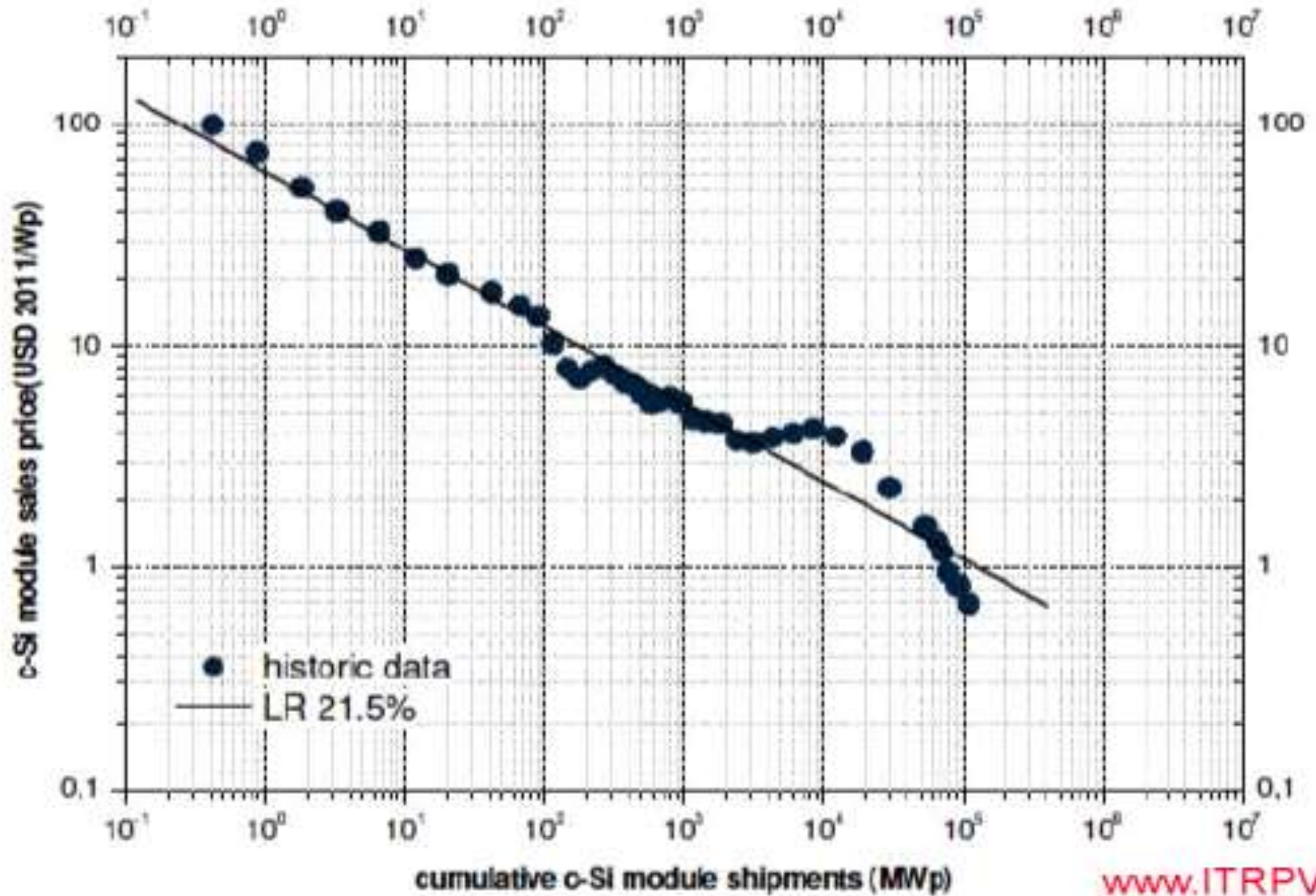
(Bloomberg, 2012)



Current pricing



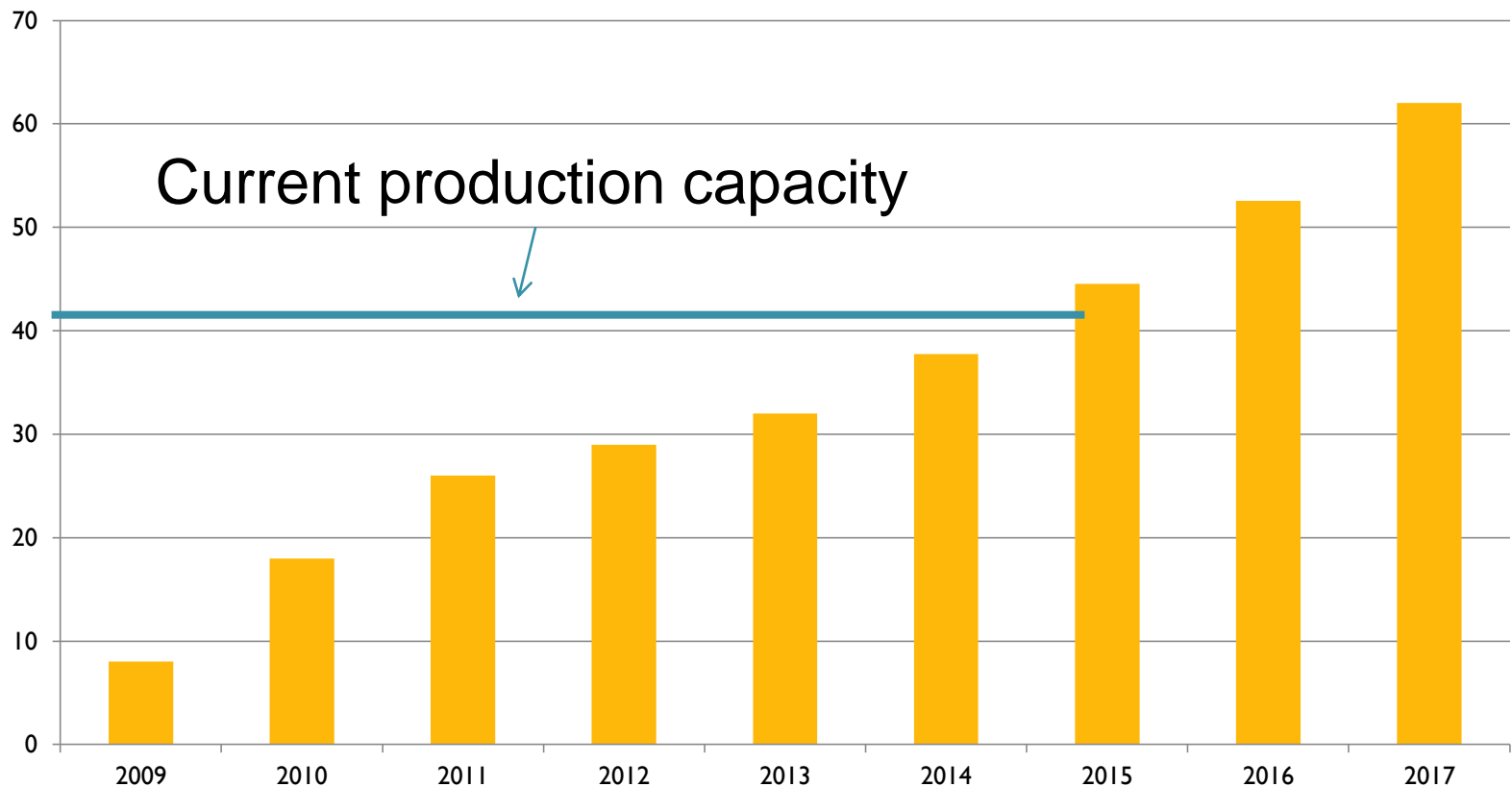
Australian
PV Association



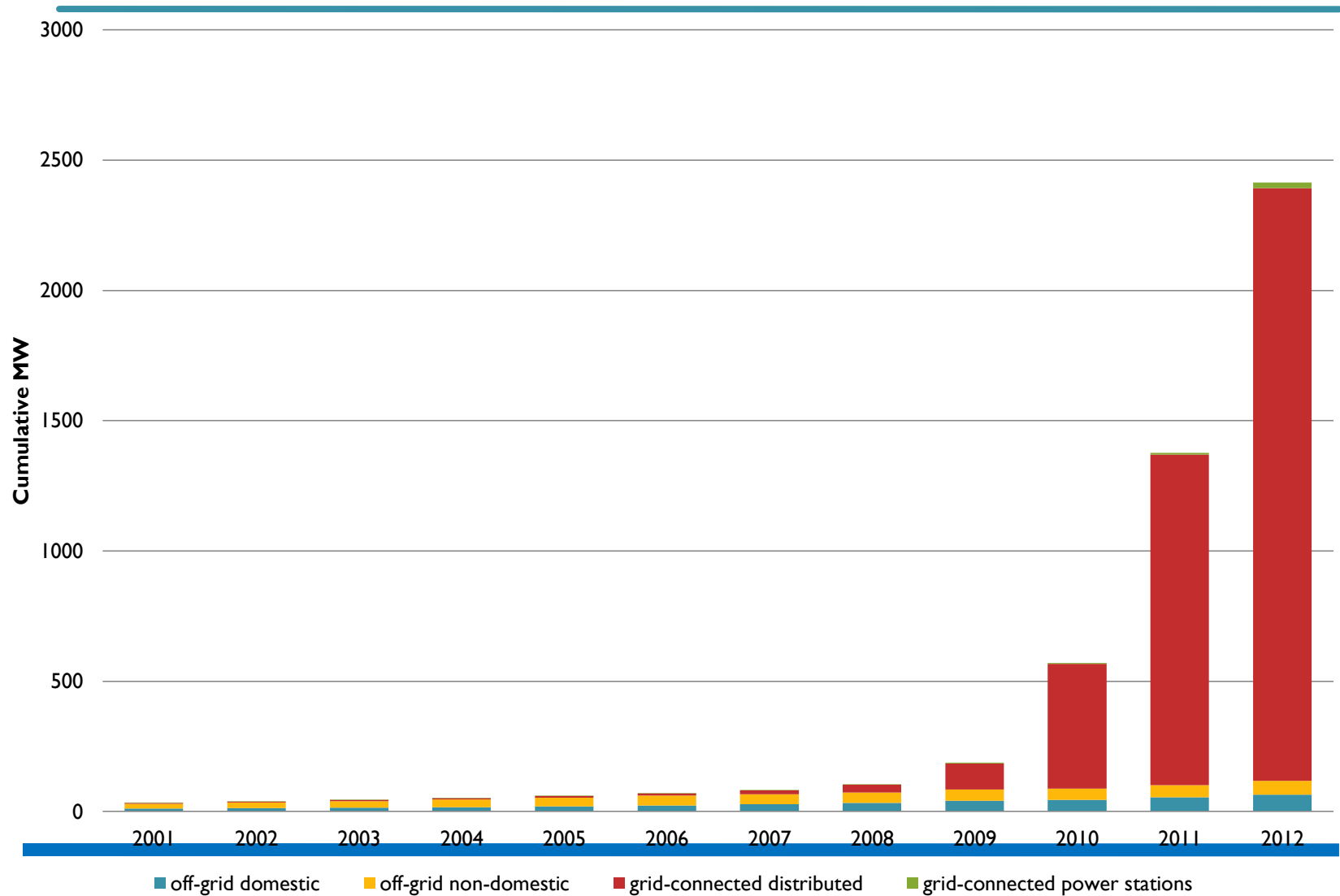
Global Market and Forecasts



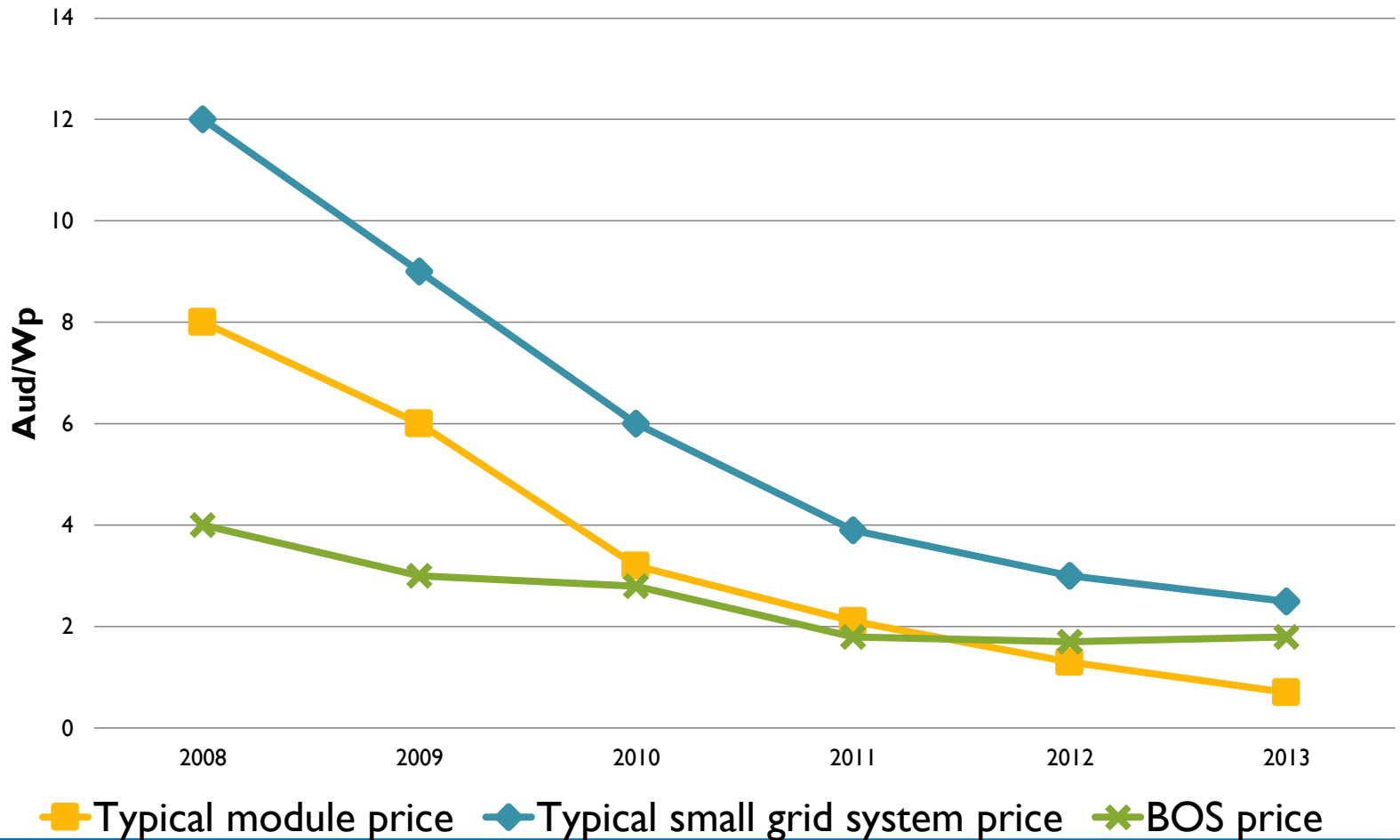
**Annual GW Installed
Historical and Projected**



Australian PV Uptake (APVA, 2013)



Australian system price trends



Australian Market Drivers



- Renewable Energy Target
 - State Feed-in Tariffs:
 - TAS, ACT & NT – net metering
 - Solar Flagships:
 - 1st stage 150 MW
 - Commercial sector interest increasing
- +
- 10-20% annual electricity price increases over several years
 - Grid parity in many areas
-

Grid Parity

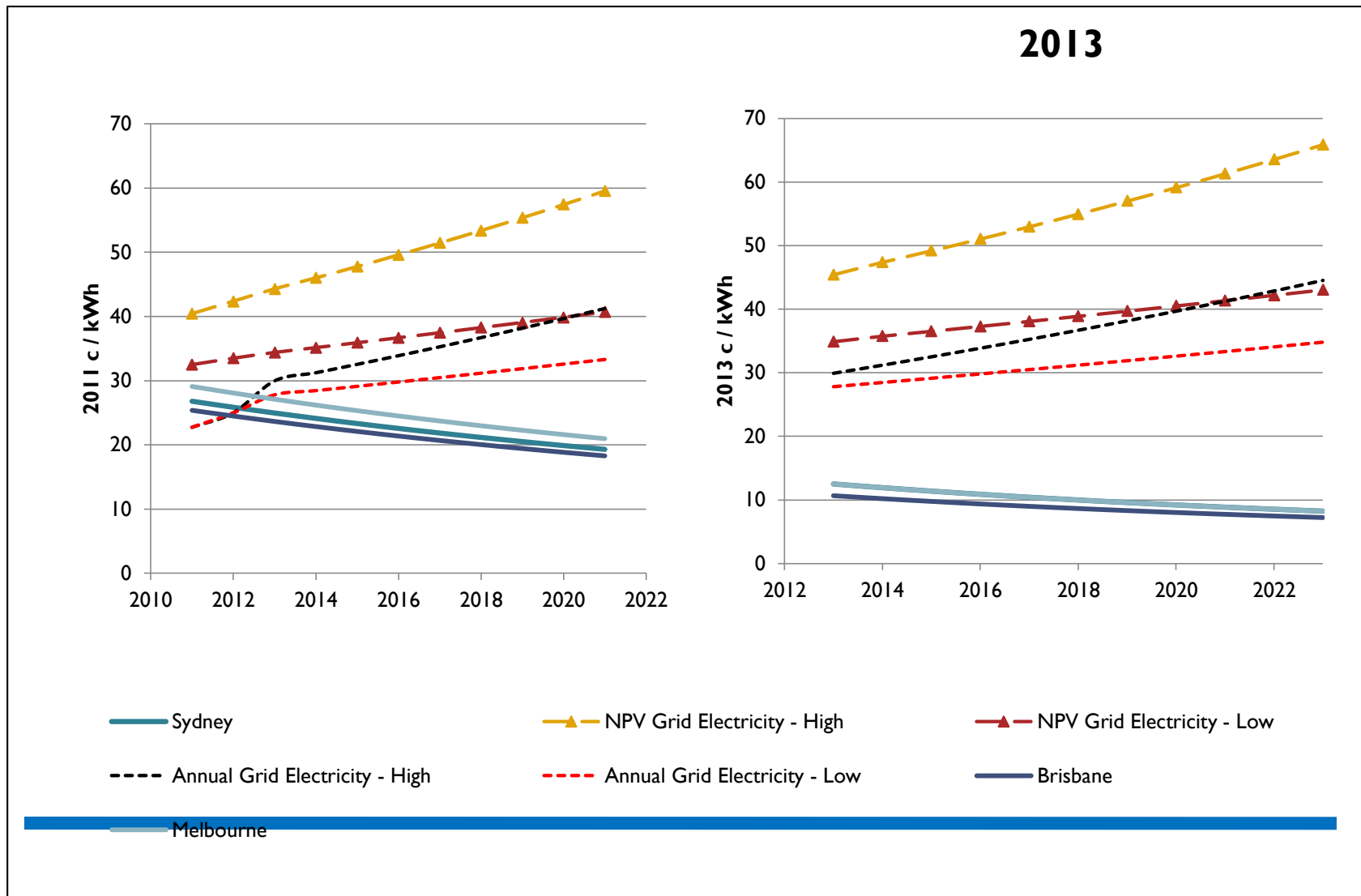


- When PV LCOE (25 yrs) = electricity tariff
 - Both reached in 2011-12 without subsidies, if all PV power receives retail tariff
 - New FiTs 0-8c/kWh compared to tariffs >30c
- Solar Credits help upfront cost (now ~\$600/kW)
- FiTs (where available) help cashflow
 - Both bring payback period from 25 to less than ~10 yrs



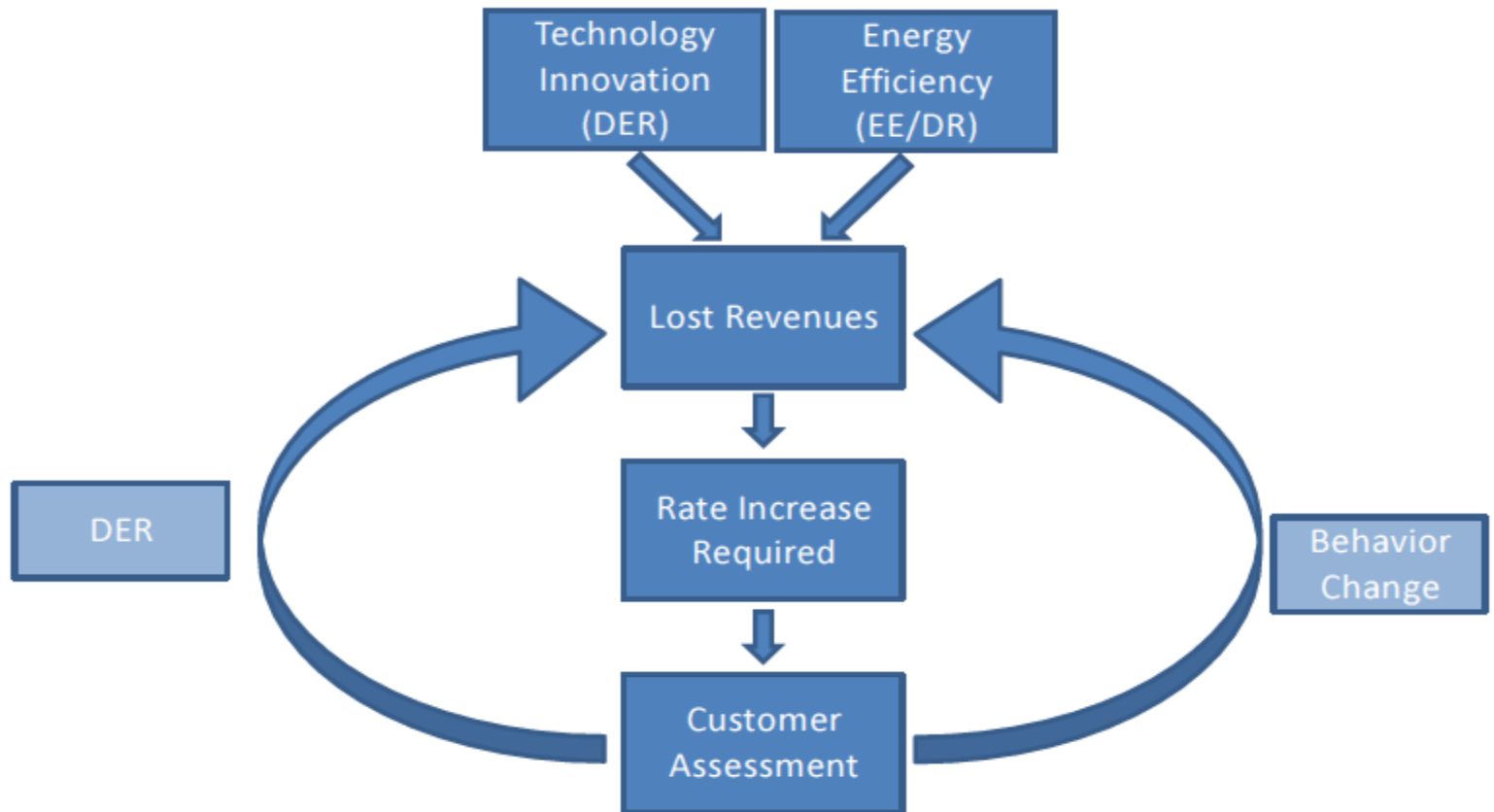
- Implications for existing electricity industry structure

Residential LCOE trends and Grid Parity Projections (APVA, 2013)



The “Death Spiral” of the Existing Electricity Industry (Kind, 2013)

Exhibit 3
Vicious Cycle from Disruptive Forces



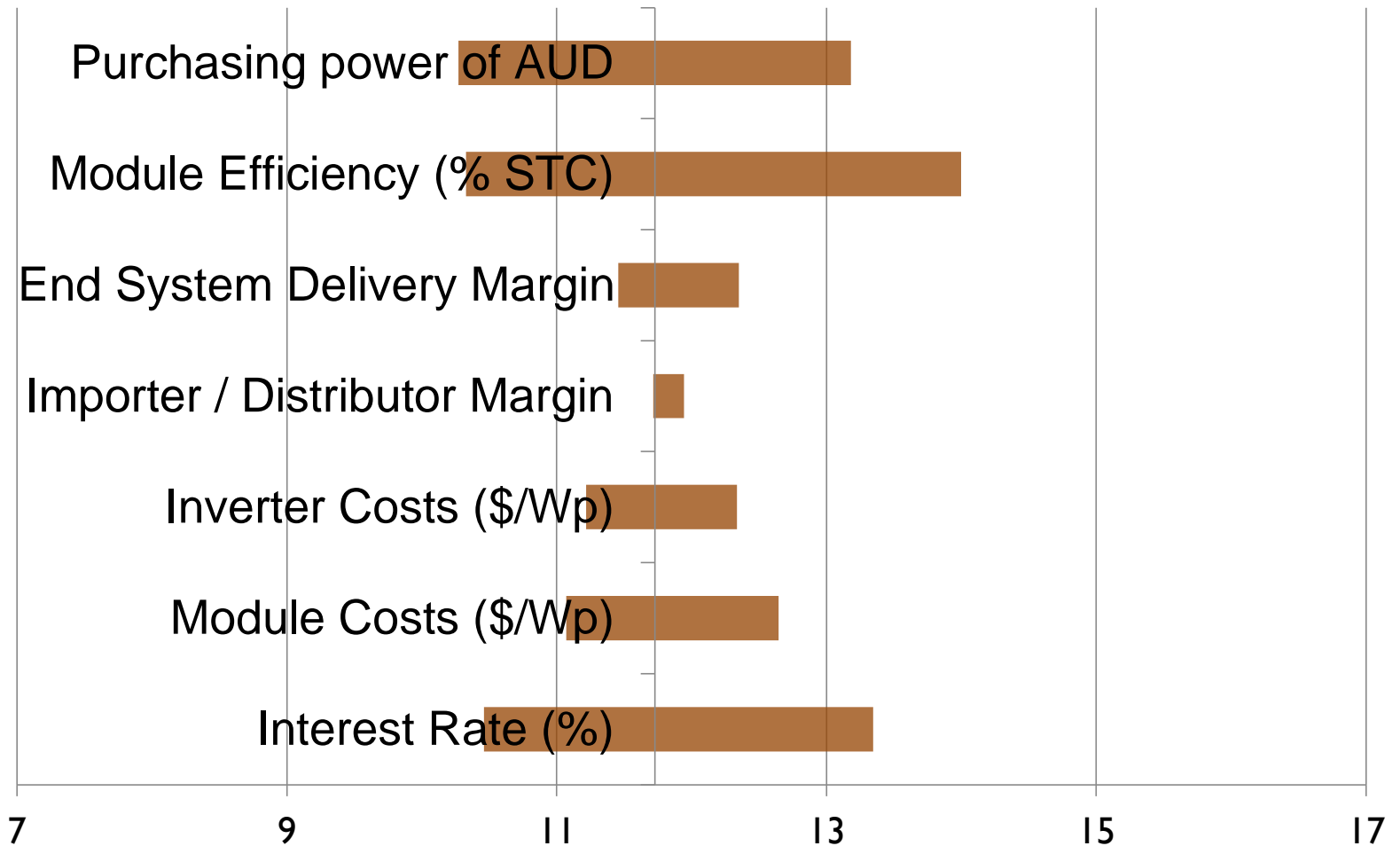
Current PV situation



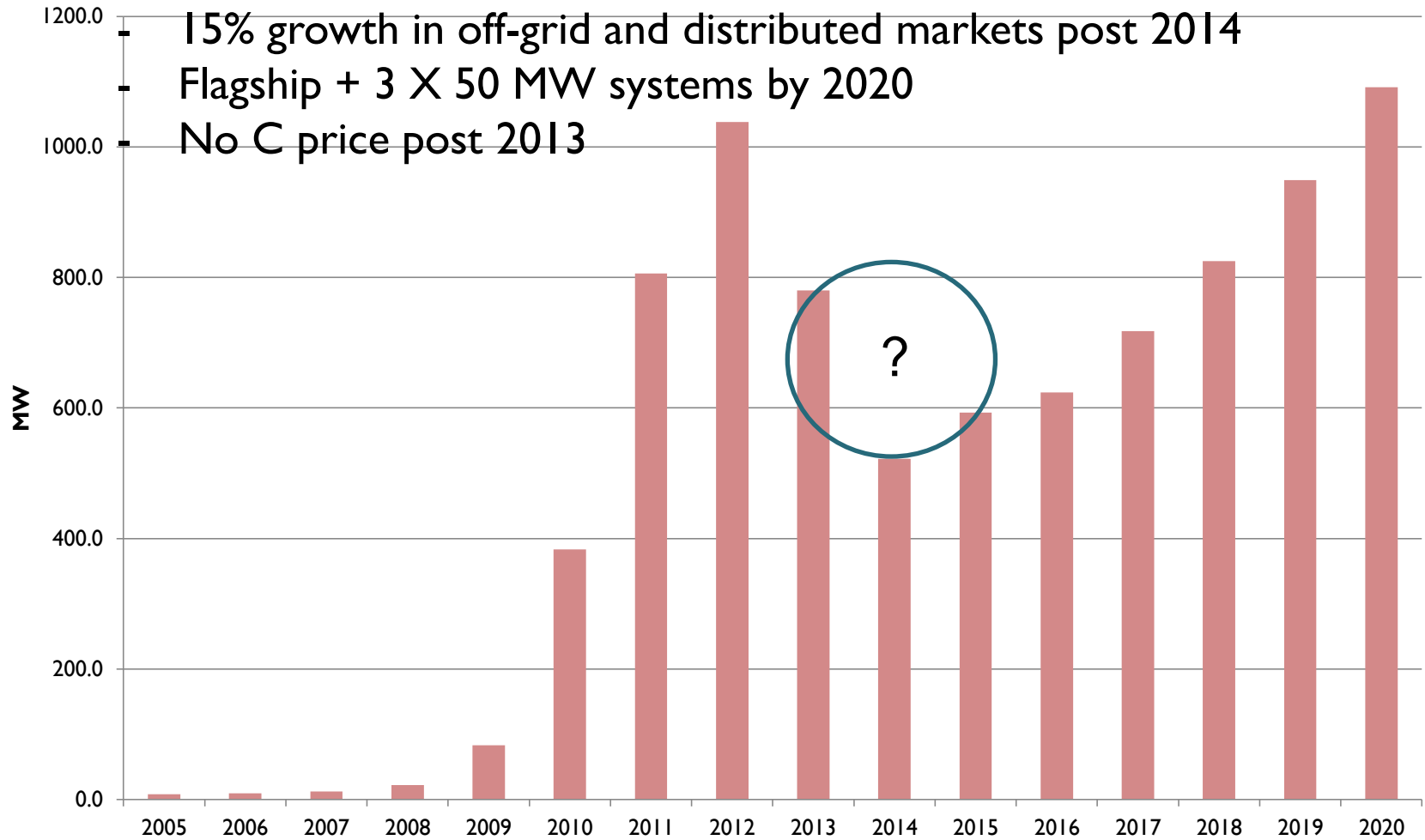
Australian
PV Association

- Market stabilising after several years of rapid growth
 - Industry consolidation & bankruptcies
 - Increasing market domination by gentailers
 - New products & marketing strategies needed
 - Low cost, reduced warranty options
 - Leasing
 - Possible combined services – electricity, shw, phone, insurance....
 - Storage
 - **BIPV**
-

LCOE Sensitivities



Possible annual installations

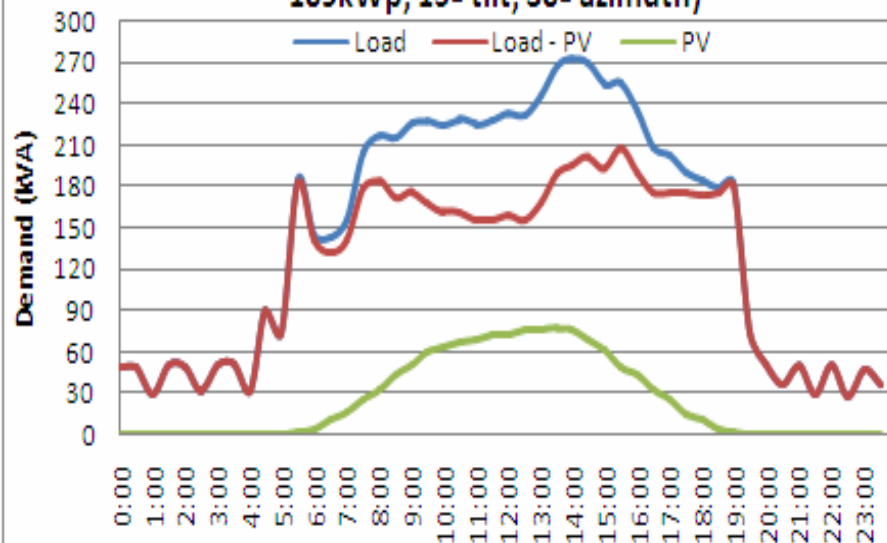


Commercial Building Market

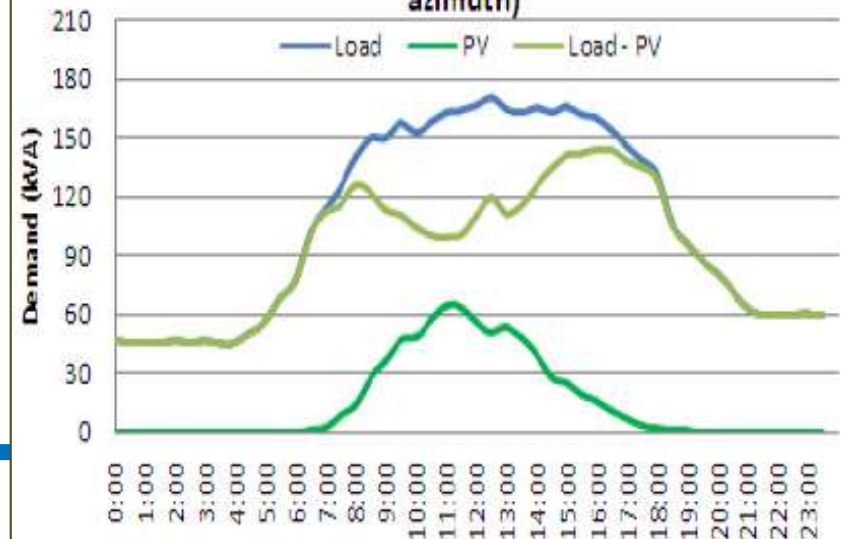
- 10% of Australia's GHG emissions
- 22% of Australia's electricity, increasing to 32% by 2029-30 (ABARE)

Source: Lam, 2008

21/12 Base building original peak day and the impact of current building design PV system (rooftop - 109kWp, 15° tilt, 30° azimuth)



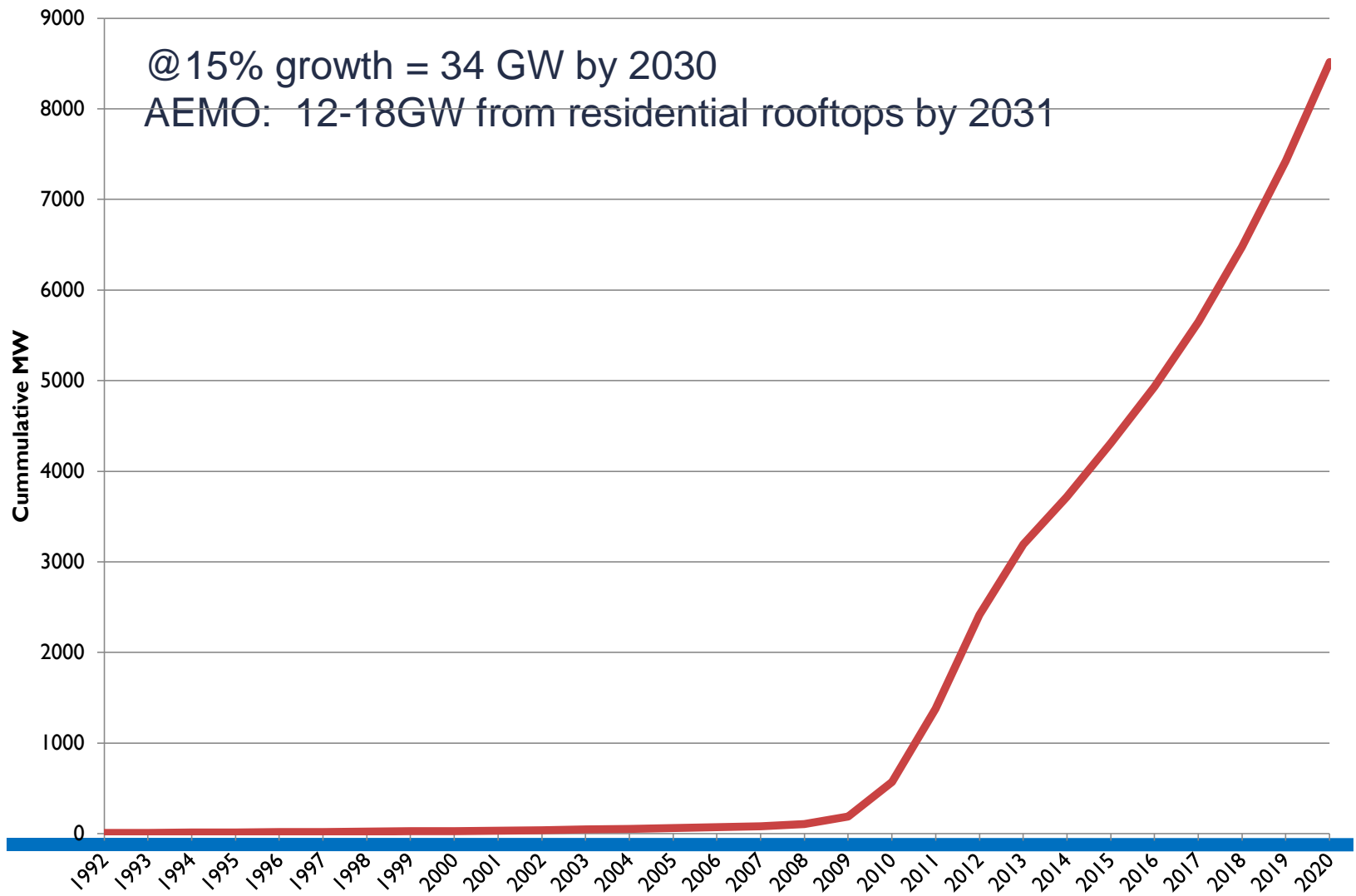
20/3 Tenant original peak day and the impact of current building design PV system (rooftop - 116kWp, 15° tilt, 0° azimuth)



Possible cumulative installations of ~8GW by 2020



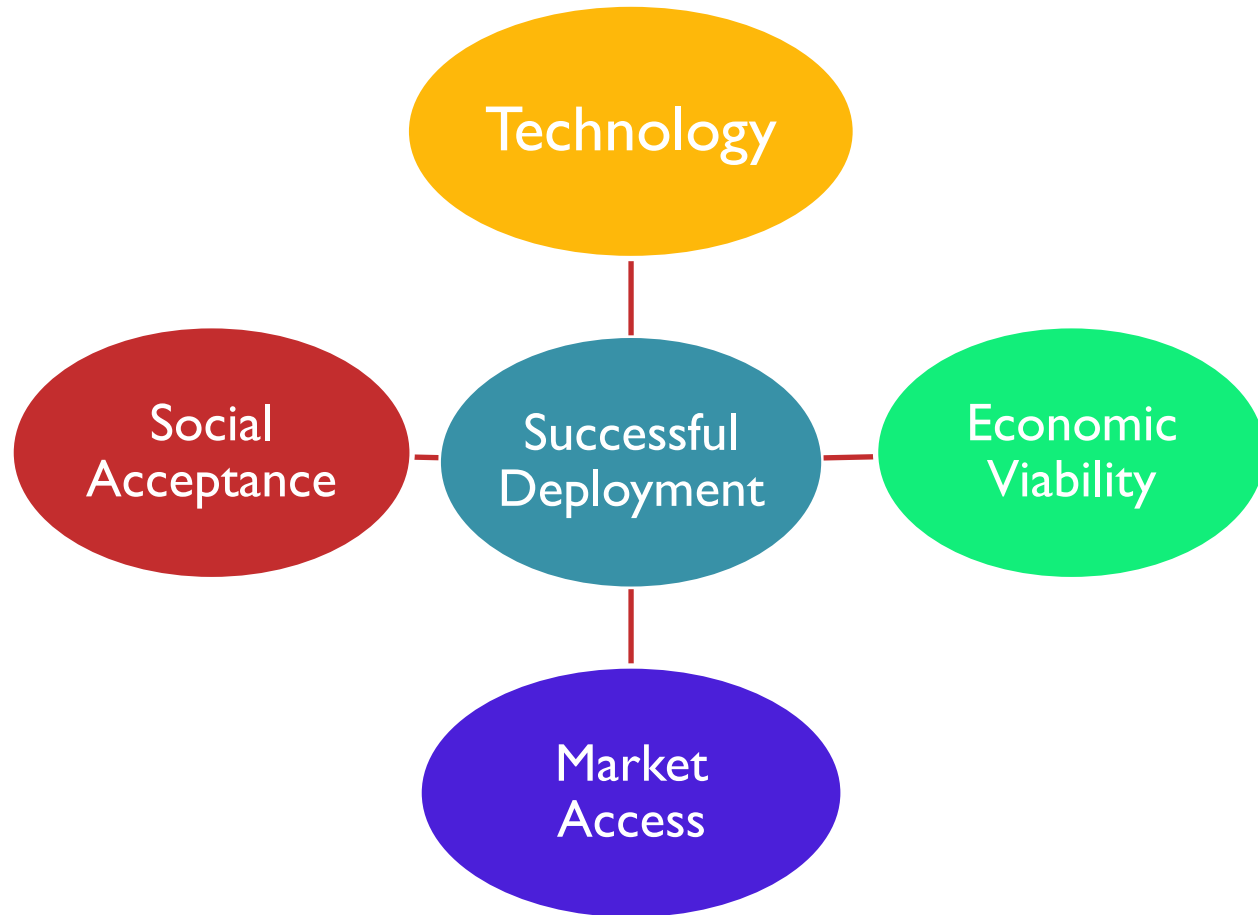
Australian PV Association



Price isn't everything



Australian
PV Association



Opportunities for BIPV

PROGRAM



- 11:45am **Role of solar power & buildings to deliver low carbon living** – A. Prof Alistair Sproul, Low Carbon Buildings CRC
- 12:15pm **PV building integration – an architect’s perspective** – Peter Gardiner, Peddle Thorp Architects
- 12:45pm **LUNCH**
- 1:30pm **TRACTILE roof integrated innovation for Australian buildings** – Jason Perkins, Tractile
- 2:00pm **Identifying & removing the complex BIPV integration barriers** – Matthew Sullivan, Moreland Energy Foundation
- 2:30pm **BIPV – International experiences & opportunities for Australia** – Mark Snow, UNSW
- 3:00pm **Discussion**
- What is holding back the BIPV market in Australia?
 - What could be done to accelerate its development?
- 3:30pm Close of workshop
- 3:45pm **Tour** of Bond University facilities

Next APVA Events



- 27th June – Solar Law Workshop, Sydney
 - Solar access
 - New planning regulations
 - Strata title issues
 - 19th July – Distributed Energy Markets, Canberra
 - Customer attitudes
 - Utility & regulator preferences
-