

THE STATUS AND OUTLOOK FOR RENEWABLE ENERGY

November 2015



CLEAN ENERGY COUNCIL

Transform Australia's energy system into a clean energy system

By leading and supporting the growth of the clean energy industry in Australia through:

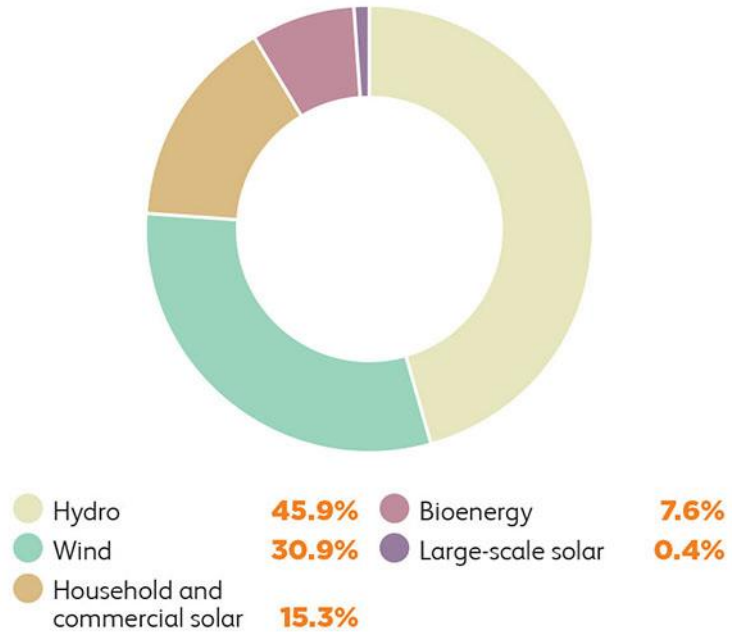
- Shaping policy
- Developing standards and regulations and ensuring the integrity of the industry
- Promoting the industry
- Providing a range of valuable services to our members, customers and partners

CONTEXT

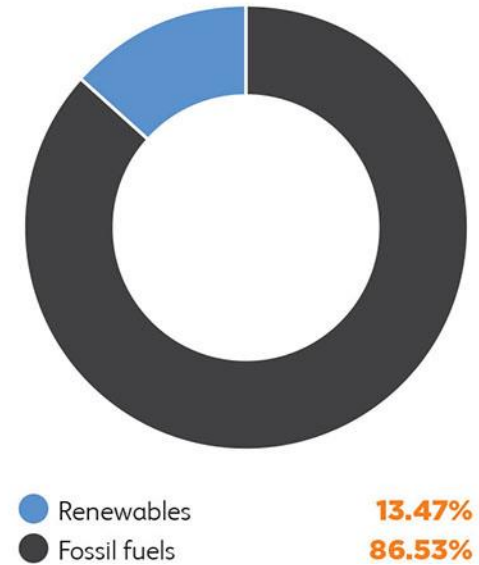
- Massive disruption in global energy systems driven by:
 - Lower energy demand. Increased peak demand.
 - Reduced cost and rapid uptake of renewable energy
 - Increasing cost and volatility of fossil fuel based generation
 - Innovation in business models
 - Major transformation of electricity sector
- Big economic opportunity in this transformation that can:
 - Create more competitive energy sector
 - Engage and empower consumers
 - Drive new investment and create employment
 - Protect Australia's long term competitiveness under lower emission paradigm

SNAPSHOT

ESTIMATED PERCENTAGE CONTRIBUTION OF EACH TECHNOLOGY TO RENEWABLE GENERATION

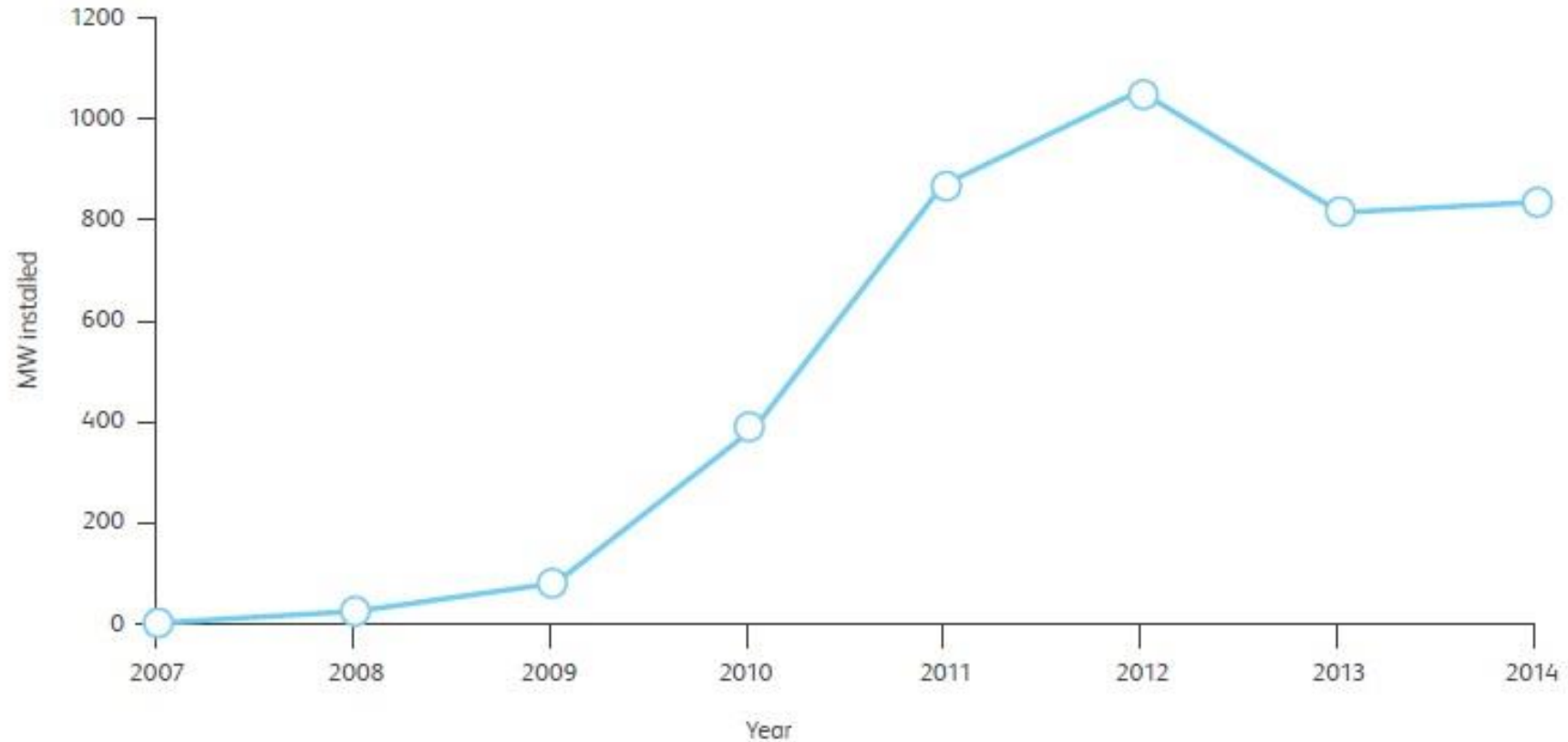


ANNUAL ELECTRICITY GENERATION 2014

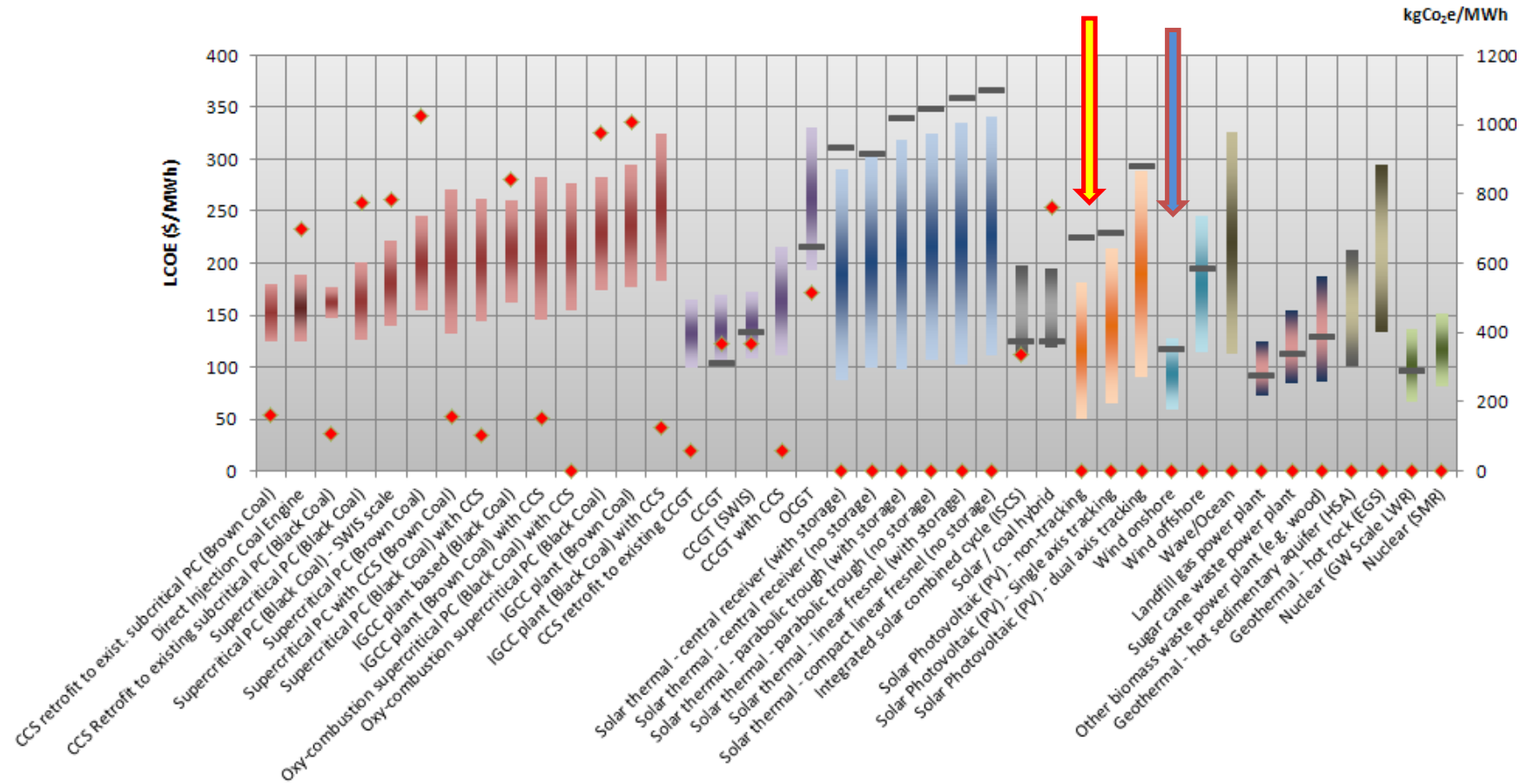


RESIDENTIAL GROWTH RATES

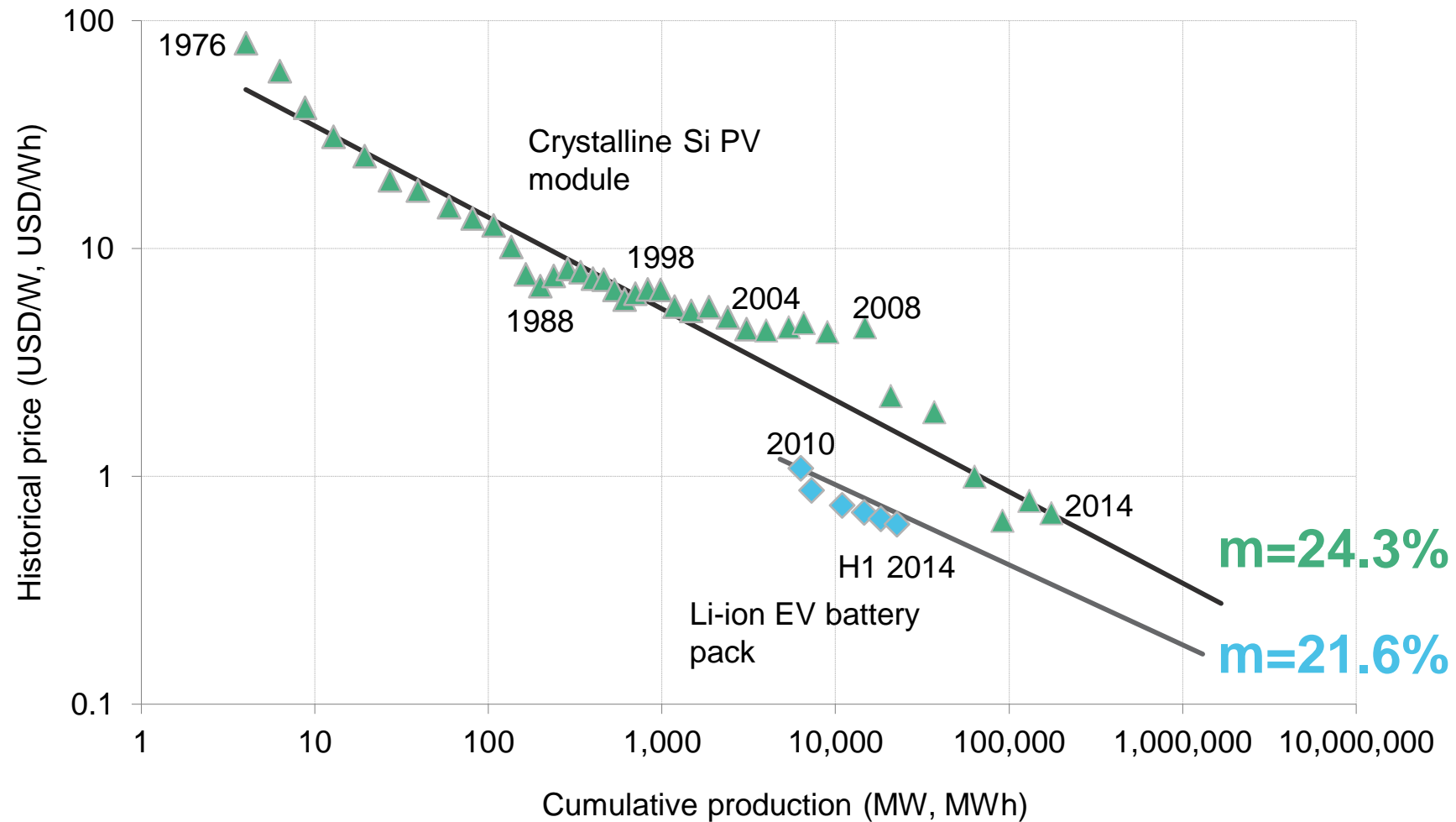
ANNUAL INSTALLED CAPACITY OF SOLAR PV IN AUSTRALIA (MW)



RENEWABLE ENERGY COST REDUCTION



LITHIUM-ION EV BATTERY EXPERIENCE CURVE COMPARED WITH SOLAR PV EXPERIENCE CURVE



Source: Bloomberg New Energy Finance, Maycock, Battery University, MIT

Note: Prices are in real (2014) USD

RENEWABLE ENERGY OUTLOOK

- RET is key to driving renewable energy investment
- Small-scale deployment of 14,000GWh by 2020. SRES phases down to 2030.
- Premium FiTs reduced from 2016.
- LRET of 33,000GWh by 2020:
 - 6,000MW new capacity
 - 30-50 major projects
 - Hundreds of commercial-scale solar projects from businesses looking to manage their own electricity production and consumption.
- 15,000 jobs and more than \$40 billion worth of investment to flow

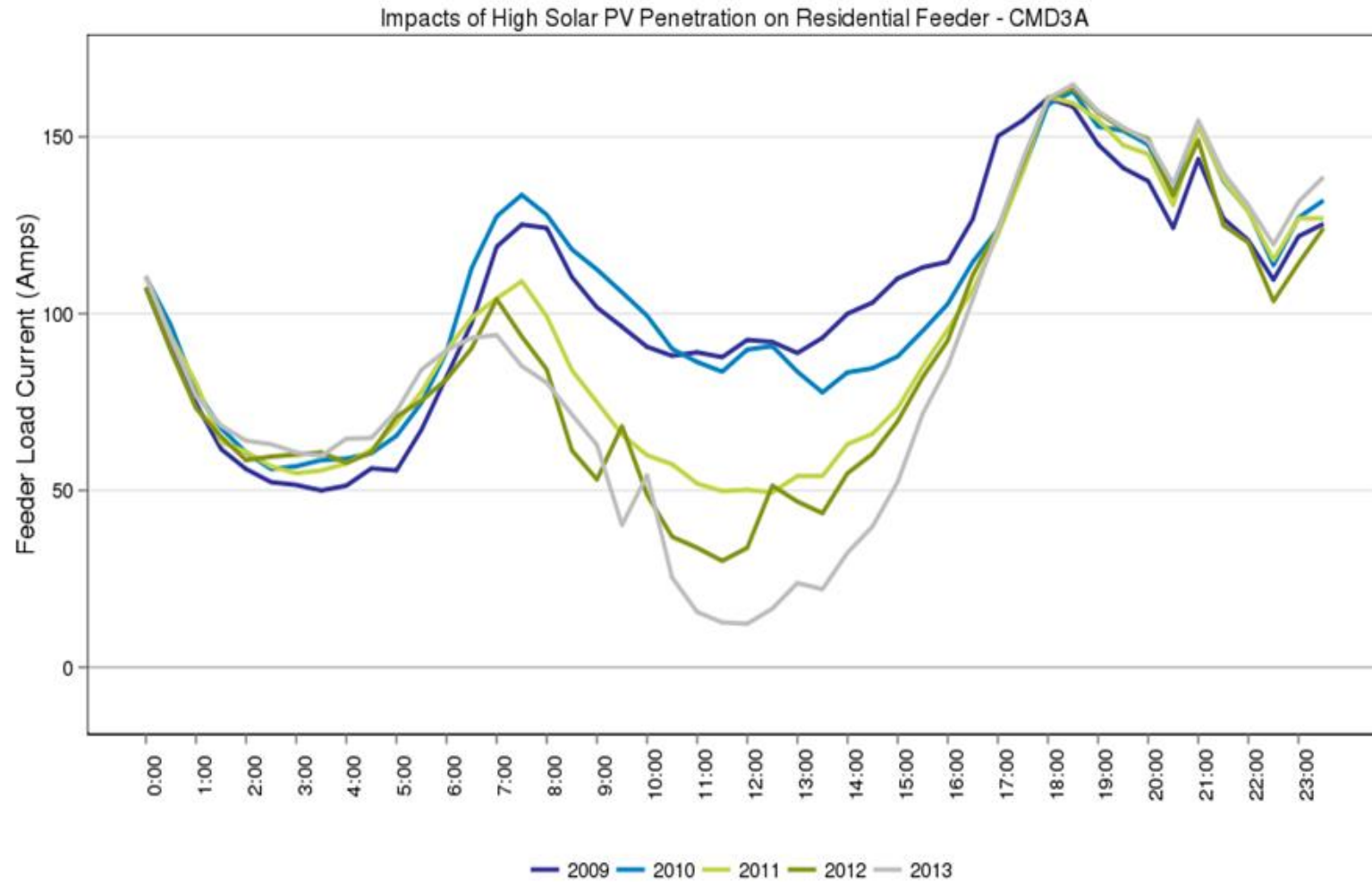
INNOVATION IS CRITICAL

- Technology innovation must continue:
 - More efficient, lower cost technology production
 - Integration technology - hybrid renewable energy systems, network integration
 - Balance of plant – rail systems, tower manufacturing, construction techniques
- Commercial innovation is accelerating
 - Overcoming customer barriers with new solutions such as solar PPA's
 - Important to respond to regulatory constraints
 - Project financing in face of changing market dynamics
- A strong market driven by long term policy stability will drive innovation

RENEWABLE ENERGY AND ENERGY EFFICIENCY

- Solar citizens become engaged consumers
- Energy efficiency and demand response follows
- Premium FiTs diluted demand response
- Battery storage is nexus between renewable energy and energy efficiency
- Tariff reform critical to exposing consumers to system wide benefits.
- Network tariffs are important, but retail exposure likely to remain limited
- Opportunity for greater alignment of incentives for service providers

ENERGY EFFICIENCY + STORAGE + SOLAR



KEY STORAGE DRIVERS

Technology cost:

- Battery unit
- Balance of plant
- Installation
- Maintenance

Consumer motivation:

- Idea of independence
- Romance factor
- Trust – performance and safety
- Return on Investment

Commercial incentives:

- Tariff arrangements
- Vehicle interaction
- Smart meter and consumer interface
- FiT arrangements

Regulation:

- Building standards
- Network regulation supporting storage investments
- Retail tariff reform recognising cost reflectivity

UNLOCKING THE POTENTIAL

- 1. Stable and long term policy*
- 2. Ensure long-term and transparent carbon reduction targets*
- 3. Increase and extend the Renewable Energy Target*
- 4. Drive innovation in next generation of clean energy technologies*
- 5. Reform the energy market*
- 6. Build and cement public support*

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