

# THE STATUS AND OUTLOOK FOR RENEWABLE ENERGY

Tom Butler

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

# MEMBERS

---



# MEMBERS

---



# CONTEXT

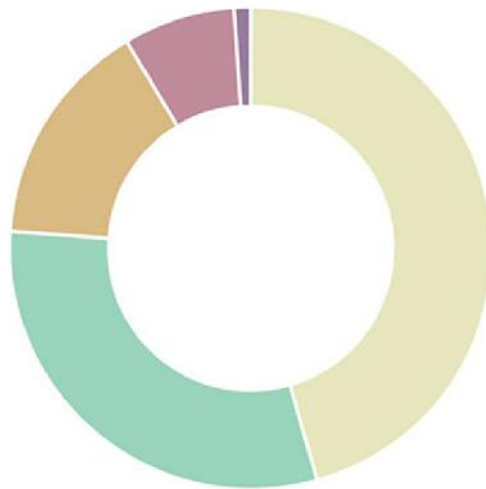
---

- Massive disruption in global energy systems driven by:
  - Lower energy demand
  - Increasing energy costs
  - Reduced cost of renewable energy
  - Rapid uptake of renewable energy
  - Increasing cost and volatility of fossil fuel based generation
  - Innovation in business models
- 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 in a low emissions paradigm

# SNAPSHOT

---

ESTIMATED PERCENTAGE CONTRIBUTION OF EACH TECHNOLOGY TO RENEWABLE GENERATION



|                                |              |                   |             |
|--------------------------------|--------------|-------------------|-------------|
| Hydro                          | <b>45.9%</b> | Bioenergy         | <b>7.6%</b> |
| Wind                           | <b>30.9%</b> | Large-scale solar | <b>0.4%</b> |
| Household and commercial solar | <b>15.3%</b> |                   |             |

ANNUAL ELECTRICITY GENERATION 2014



|              |               |
|--------------|---------------|
| Renewables   | <b>13.47%</b> |
| Fossil fuels | <b>86.53%</b> |

# SNAPSHOT

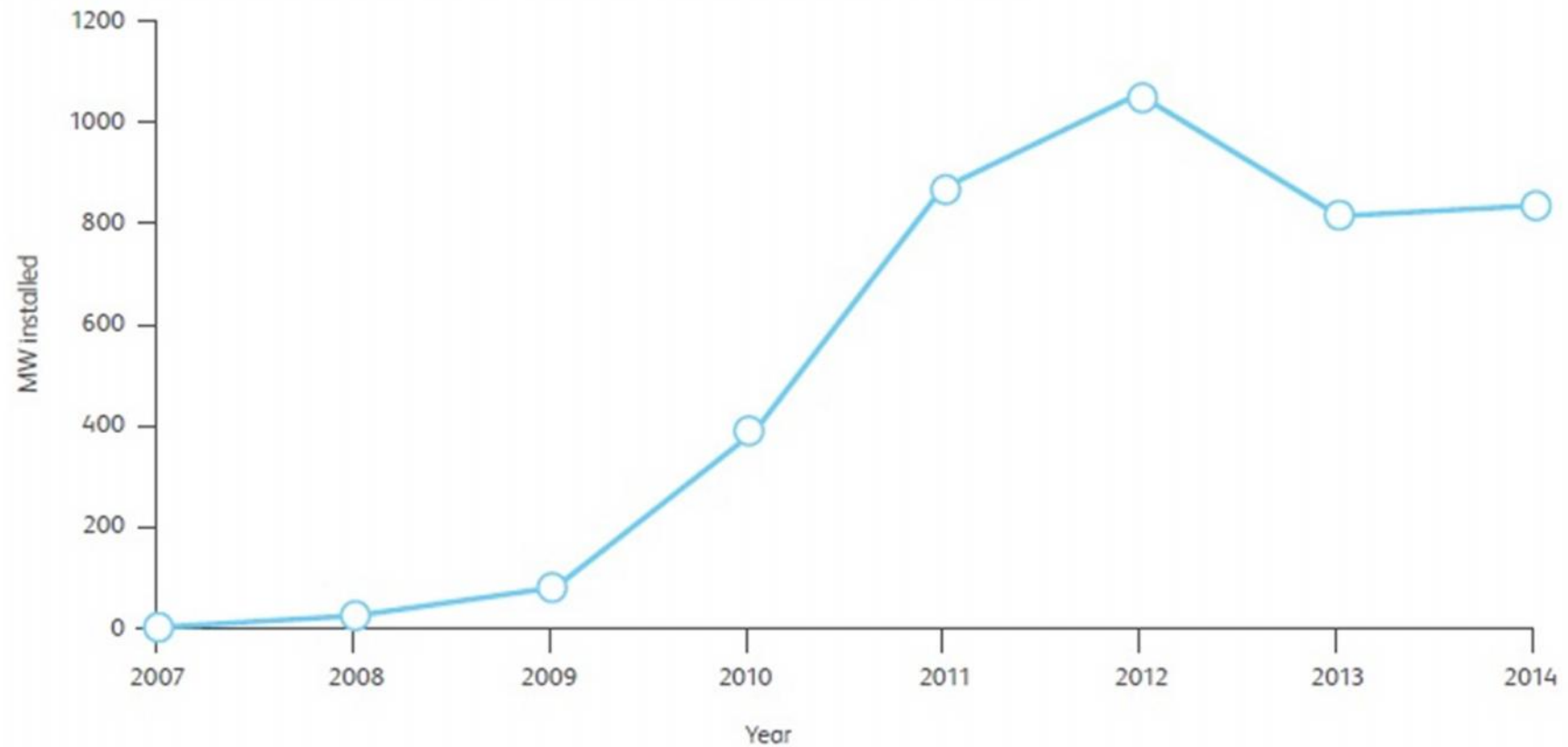
---

## PENETRATION OF RENEWABLE ENERGY - BY STATE

| State | Total generation (GWh) | Fossil fuel generation (GWh) | Renewable generation (GWh) | Penetration of renewables |
|-------|------------------------|------------------------------|----------------------------|---------------------------|
| SA    | 11,933                 | 7115                         | 4817                       | 40%                       |
| WA    | 18,425                 | 16,082                       | 2343                       | 13%                       |
| VIC   | 53,203                 | 48,037                       | 5166                       | 10%                       |
| TAS   | 11,004                 | 584                          | 10,420                     | 95%                       |
| NSW   | 60,594                 | 57,226                       | 3368                       | 6%                        |
| QLD   | 57,683                 | 53,797                       | 3885                       | 7%                        |

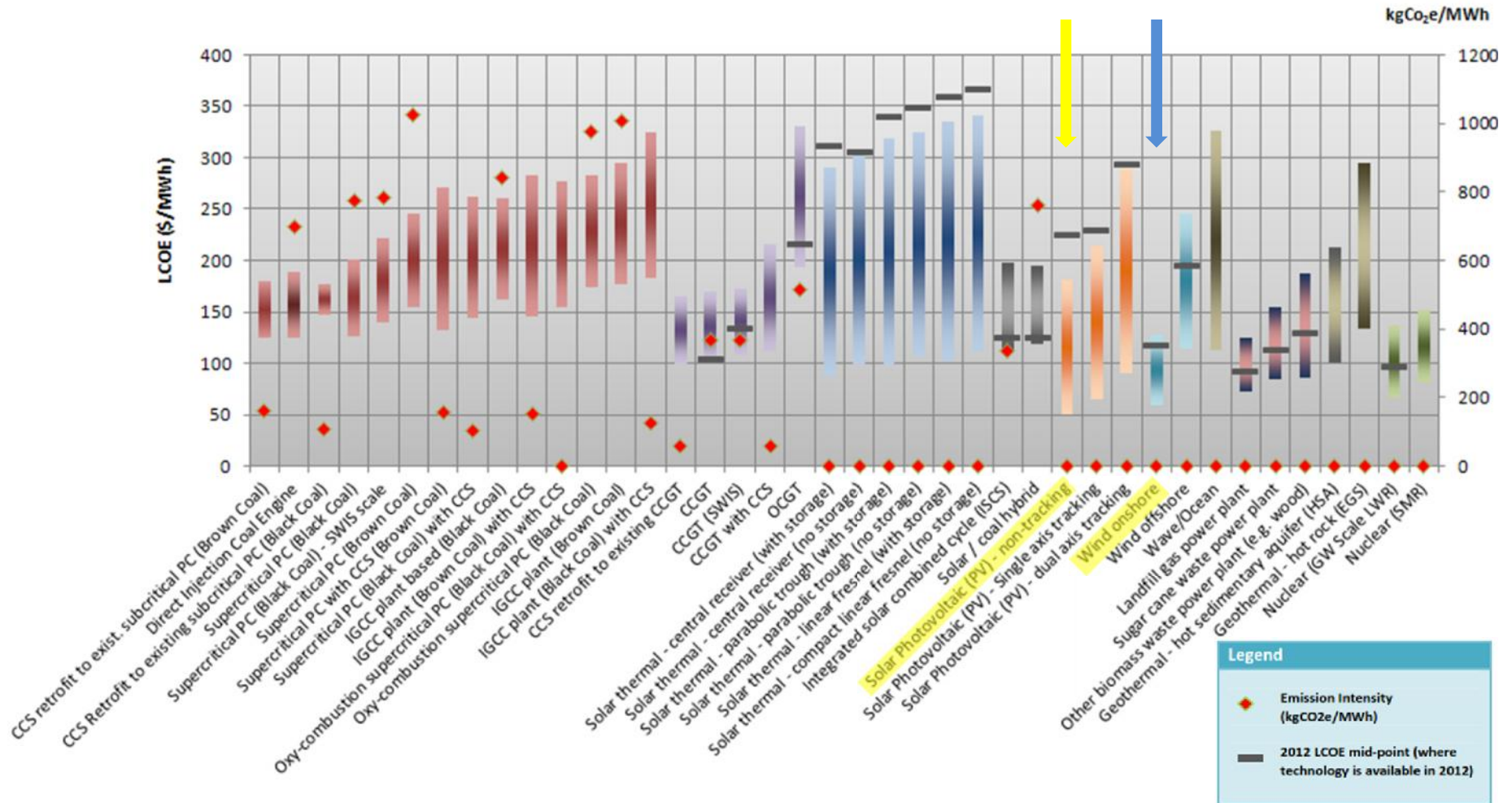
# RES/COMM PV GROWTH RATES

ANNUAL INSTALLED CAPACITY OF SOLAR PV IN AUSTRALIA (MW)



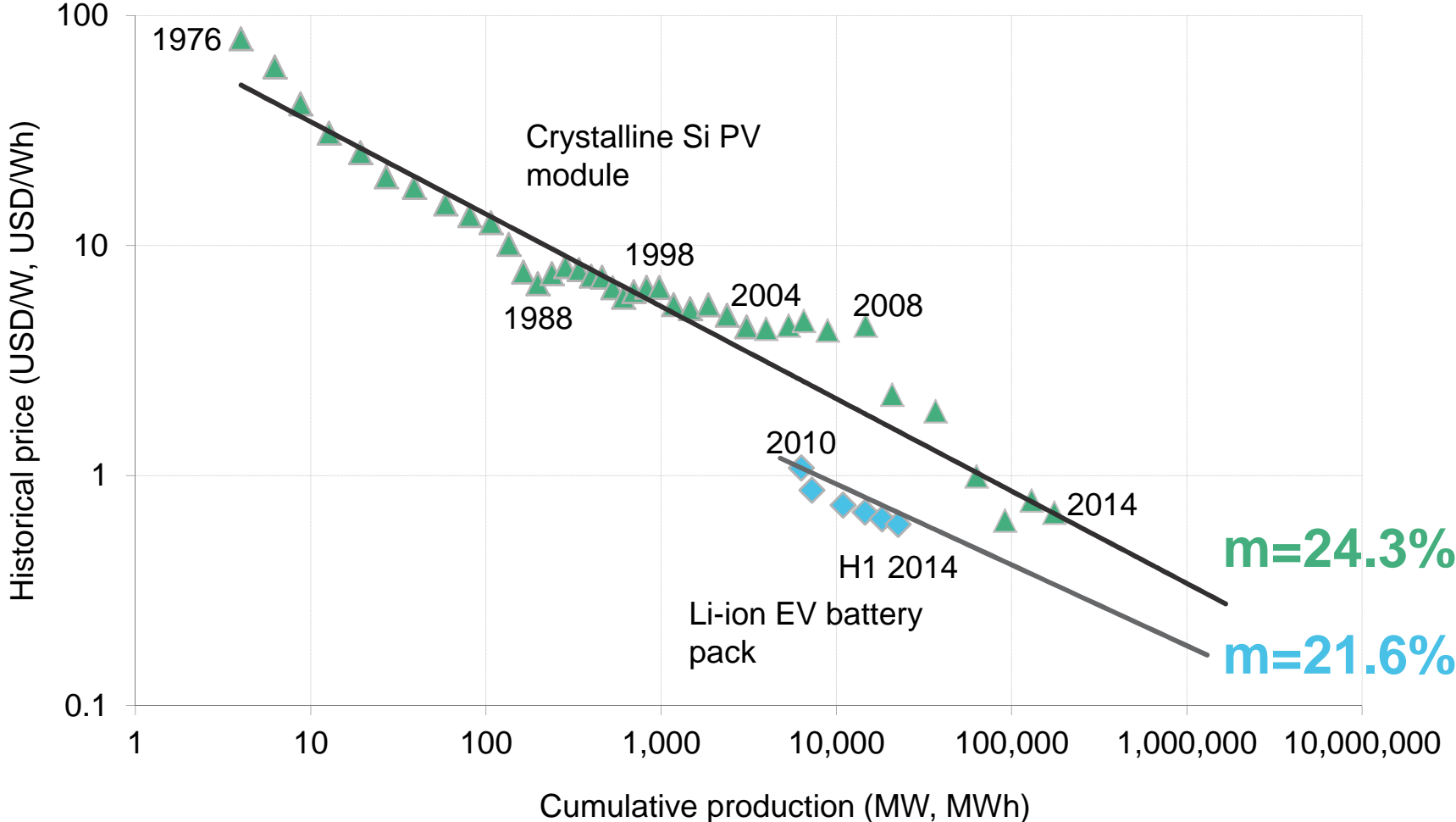


# RENEWABLE ENERGY COST REDUCTION



Source: AETA LCOE Comparison Chart 2012, 2030 technology costs comparison, [www.industry.gov.au](http://www.industry.gov.au)

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



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

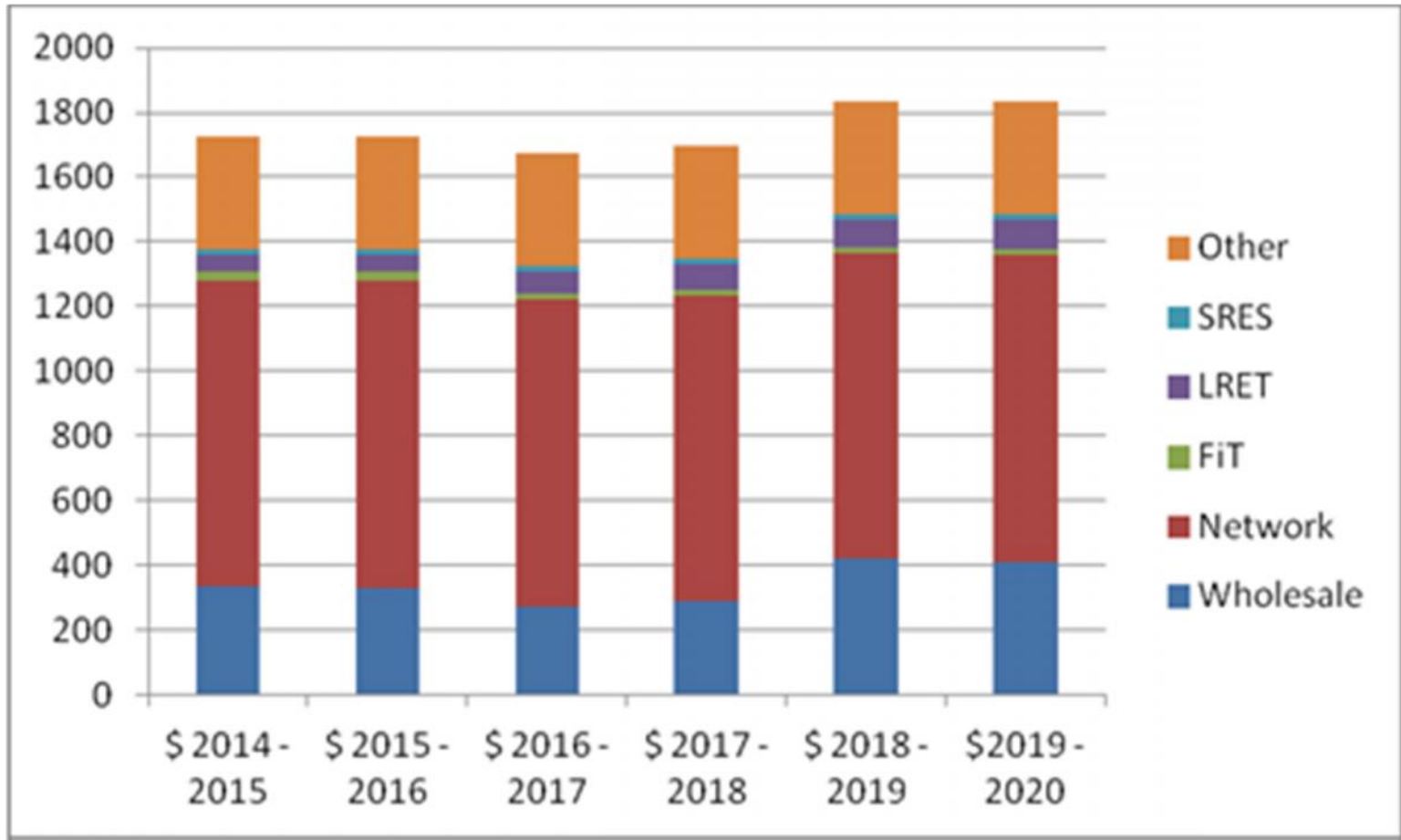
Note: Prices are in real (2014) USD

# RENEWABLE ENERGY TARGET

---

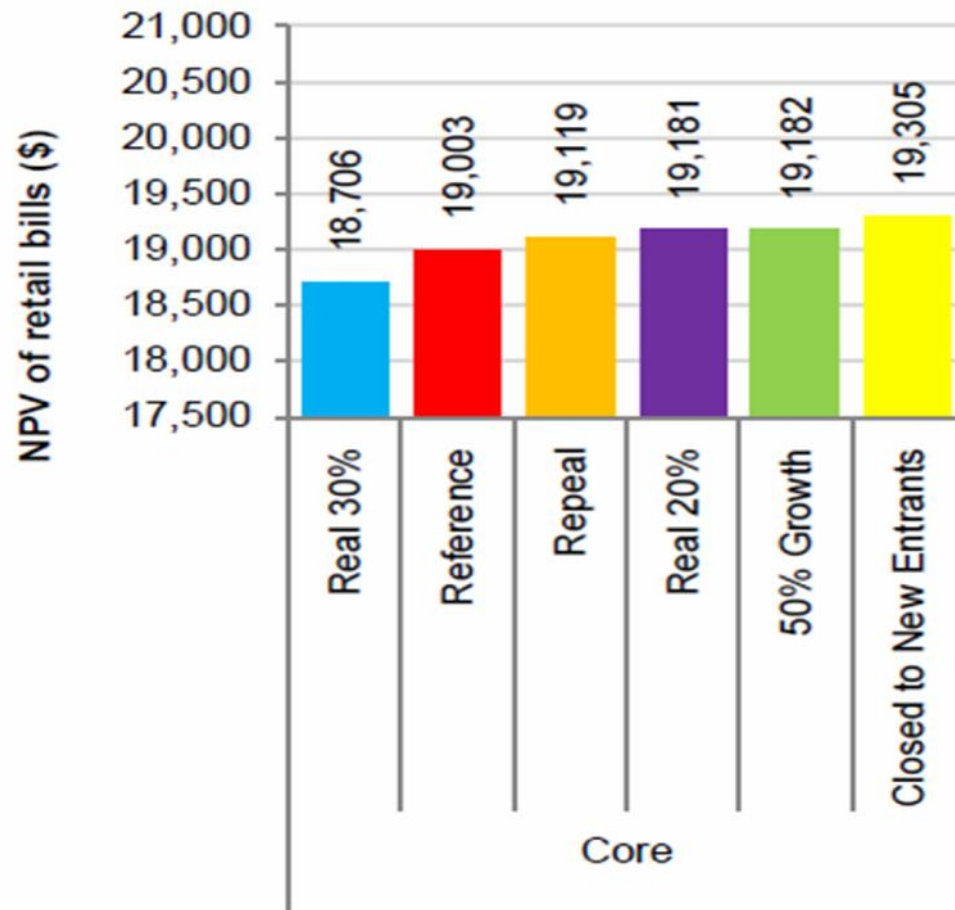
- RET is key to driving renewable energy investment
- Small-scale deployment of 14,000 GWh by 2020. SRES phases down to 2030.
- LRET of 33,000 GWh by 2020:
  - 6,000 MW new capacity
  - 30-50 major projects
  - Hundreds of commercial-scale solar projects from businesses looking to manage their own electricity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

# POWER BILLS IN AUSTRALIA



# RETAIL IMPACT OF RENEWABLE ENERGY

- Cost of renewable energy certificates added to retail bill
- Offset by lower wholesale prices



# VICTORIAN STATUS

---

- Wind
  - 17 operational wind farms, 1070 MW
  - Two currently under construction with help from ACT Government
  - Home of biggest wind farm in southern hemisphere 420 MW
  - 28.1% of the nations wind capacity
- Solar
  - 708 MW of capacity in the state
  - Over 249,000 systems
  - 18% of the nation's PV capacity
  - Over 1000 accredited installers
- Jobs
  - 4100 out of national total of 20,000. Over 700 in wind, 2,500 in solar PV, others from SHW, hydro, bioenergy

# TOP 10 SOLAR POSTCODES

---

| Postcode | Suburbs  | Installations | Capacity (kW) |
|----------|--|---------------|---------------|
| 3029     | Hoppers Crossing, Tarneit, Truganina                   | 4978          | 13072         |
| 3977     | Botanic Ridge, Cannons Creek, Cranbourne               | 4503          | 12289         |
| 3030     | Cocoroc, Derrimut, Point Cook, Quandong, Werribee      | 4489          | 12426         |
| 3023     | Burnside, Burnside Heights, Cairnlea, Caroline Springs | 3213          | 8455          |
| 3064     | Craigieburn, Donnybrook, Kalkallo, Mickleham           | 3040          | 8736          |
| 3805     | Fountain Gate, Narre Warren, Narre Warren South        | 2973          | 8271          |
| 3216     | Belmont, Freshwater Creek, Grovedale, Grovedale East   | 2710          | 7462          |
| 3150     | Brandon Park, Glen Waverley, Wheelers Hill             | 2316          | 5867          |
| 3806     | Berwick, Harkaway                                      | 2265          | 6255          |
| 3037     | Calder Park, Delahey, Hillside, Sydenham               | 2241          | 6449          |

# BUSINESS DEMAND

---

- Massive opportunity for commercial scale solar PV in SMEs
- Major shift as large corporations seek to directly contract renewable energy supply, largely driven by retail tariffs
- Financing innovation now providing leasing and PPAs
- More than 50 new solar power systems were installed in 2014 that were over 100 kW but less than 1 MW.
- Shorter lead times than large-scale solar power plants.



# Ararat Wind Farm



- Approx. \$500m investment
- Attracted world class international investors (ACT FiT)
- Approx. 165 jobs during construction
- \$9.6 million potential local investment by construction workforce into region
- Up to 13 permanent + 10 contractor jobs during 25+ year operation
- Community fund - \$2m over project life
- 240MW – power approx. 120,000 homes
- Third largest wind farm in Australia

- Construction underway
- Local contracts include:
  - Keppel Prince (towers)
  - Wilsons (transformers)
  - Earthworks
  - Fencing
  - Vehicles



# 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*

# THE STATUS AND OUTLOOK FOR RENEWABLE ENERGY

Tom Butler

[tbutler@cleanenergycouncil.org.au](mailto:tbutler@cleanenergycouncil.org.au)

0431 248 097

