Today’s presentation

• Overview of the design of the National Electricity Market (NEM)
• Changes, current trends and impacts
• Governance framework
• The AEMC’s role and our current work.
National electricity market

- >40,000 km of transmission lines
- ~200 TWh of electricity to businesses and households each year
- Total electricity generating capacity of almost 54,421 MW (as at Dec 2017)
- >$18 billion annual turnover in 2018
NEM market design

WHOLESALE MARKET
(Generators sell their power to retailers)

RETAIL MARKET

More consumers are buying and selling power

NATURAL MONOPOLIES

ELECTRICITY SUPPLY CHAIN

ELECTRICITY GENERATION
TRANSMISSION NETWORK
DISTRIBUTION
RETAILER
CONSUMERS

NETWORK REGULATION

The rules enable the regulator to set the maximum prices network business can charge for services they provide. Prices are set every five years.

AEMC MAKES THE RULES
AUSTRALIAN ENERGY REGULATOR (AER) APPLIES THE RULES

Natural Monopoly Sector Component 46.5%
Competitive Sector Component 53.5%

Based on the average NSW residential bill in 2017/2018. Source: AEMC Price Trends 2018
Black and brown coal account for 77% of total generation across the NEM.

Source: AEMC analysis (MMS Database)
But the generation mix is changing – renewables are entering, thermal is exiting.
Trends in national prices, bills and supply chain cost components

Source: AEMC, Price trends 2018. Representative residential customer: 4,596 kWh per year
National average representative residential retail electricity prices over time

Source: AEMC analysis
Note: The national average retail prices in this chart are based on the national average consumption level for the representative consumer, as it applied in Residential Electricity Price Trends Reports that were published from 2009 to 2018. The national average consumption level has changed over time due to changes in the characteristics and consumption profile of the representative consumer in some jurisdictions.
Medium term wholesale price dynamics

- **Investment driven by the LRET** increases competition putting downward pressure on prices.
- **Long-run marginal cost:** increases as higher capital cost renewables comprise an increasing share of generation.
- **Competition increases as prices rise putting downward pressure on prices.**
- **Short-run marginal cost:** decreases as renewables, which have negligible fuel costs, comprise an increasing share of generation.
- **Fall in prices may influence some thermal generation to withdraw which reduces competition putting upward pressure on prices.**

Source: Developed by the AEMC
DER is also increasing – total cumulative PV capacity installed by state (MW)

Source: AEMC analysis July 2009 July 2018
This is changing the shape of demand – SA demand profile (average across calendar year)
By 2039, Australia is forecast to have approximately...

16 GW  
Residential rooftop capacity

7.5 GW  
Residential battery storage

25%  
Vehicles will be electric vehicles (including hybrids)
By 2050 ...

2 of 3 electricity customers are expected to have some form of distributed energy resources.
Our vision for the future electricity system

• **Benefits for all users**
  A fully integrated system delivering benefits for all users

• **A consumer-centric system**
  A flexible system responding to consumer preferences

• **Dynamic and resilient**
  New technologies and business models creating different dimensions of system usage

Distributed energy resources plays an important role in the future grid
Four potential models of electricity supply

1. Standard grid supply
2. Embedded networks
3. Microgrids
4. Individual power systems
ROLES AND RESPONSIBILITIES OF DIFFERENT BODIES
We are the rule maker for Australian electricity and gas markets
Council of Australian Governments (COAG) implements policy reforms of national significance that require cooperative action by federal, state and territory governments.

COAG Energy Council is made up of the nation’s energy ministers. They provide national leadership on energy market development which is so important for the health of the national economy.
Market body roles

**Australian Energy Market Commission**
Rule maker, market developer and expert adviser to governments
*Protects consumers and achieves the right trade-off between cost, reliability and security.*

**Australian Energy Regulator**
Economic regulation and rules compliance
*Polices the system and monitors the market.*

**Australian Energy Market Operator**
Electricity and gas systems and market operator
*Works with industry to keep the lights on.*
We have a unique system in Australia where anyone, any company, government, advocacy group or individual person, can propose a change to the rules.

Collaboration is the key to success as it will deliver workable and lasting change.
## AEMC priority areas of reform

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<tr>
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<th>Priority Area</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Generator access and transmission pricing</td>
<td>Shift from large geographically concentrated to small geographically dispersed generation</td>
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<td>2</td>
<td>System security</td>
<td>Services previously provided for free not necessarily provided by new generation</td>
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<td>3</td>
<td>Integrating distributed energy resources</td>
<td>Increased adoption of small-scale solar and energy storage technologies</td>
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<tr>
<td>4</td>
<td>Digitalisation of energy supply</td>
<td>Increased adoption of digital technologies</td>
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<td>5</td>
<td>Aligning financial incentives with the physical needs</td>
<td>More variable demand and supply creating volatility</td>
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