



creating sustainable change through education, engineering and leadership

Embedded Networks

Aggregating DERs and Enabling Grid Value

Training • Consulting • Engineering • Publications



Embedded Networks

AUSTRALIAN ENERGY MARKET COMMISSION – EMBEDDED NETWORKS FINAL DETERMINATION 17 DEC 2015 POWER OF CHOICE RULES UPDATE

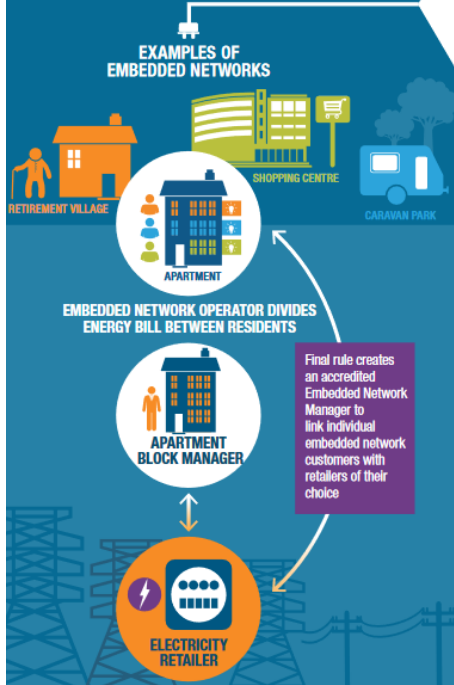
A market-wide energy reform program called Power of Choice is putting in place more efficient price signals, allowing customers to choose between a wider range of services and giving them the information they need to choose the electricity services that suit them best.

The Embedded Networks Final Determination is part of a package of rules which builds on reforms already made so customers have more choices in the way they use energy and manage their bills.

Governance agencies working together on reform program

	2015	2016	2017		
	AEMC	AUSTRALIAN ENERGY MARKET OPERATOR AEMO	AUSTRALIAN ENERGY REGULATOR AER	AUSTRALIAN ENERGY MARKET OPERATOR AEMO	New rules start
Embedded Networks To promote competition by giving more embedded network customers a choice between services from retailers or from their embedded network operators.	Final determination published 17 DEC 2015	Amend and publish existing procedures 1 SEP 2016	Distribution network ring-fencing guideline published and exemption guidelines revised 1 DEC 2016	Embedded Network Manager service level procedures and accreditation requirements published 1 MAR 2017	Commencement of Embedded Networks rules 1 DEC 2017
Competition in Metering To remove the networks' effective metering monopoly and allow new competitors to offer metering services – giving consumers a choice to either keep their existing working meter or take up new services that advanced meters enable.	Final determination published 26 NOV 2015	Amend and publish existing procedures 1 SEP 2016	Distribution network ring-fencing guideline published 1 DEC 2016	Metering Coordinator registration documentation published 1 MAR 2017	Commencement of Competition in Metering rules 1 DEC 2017
Meter Replacement Processes ⁽¹⁾ To clarify rule requirements on when meters can be changed during the switching process so energy service providers are clear on their roles and obligations – increasing the metering framework's efficiency.	Draft determination published 17 DEC 2015 Publish final determination MAR 2016	Update meter churn procedures if required 1 SEP 2016			Anticipated commencement of Meter Replacement Processes rules 1 DEC 2017
Shared Market Protocol (Updating the electricity B2B framework) ⁽¹⁾ To define the language or format of communication between parties using advanced meters. This is an important step in the reform program to establish a competitive market for new energy services.	Advice published 8 OCT 2015 Consultation paper published 17 DEC 2015				Anticipated commencement of Shared Market Protocol 1 DEC 2017

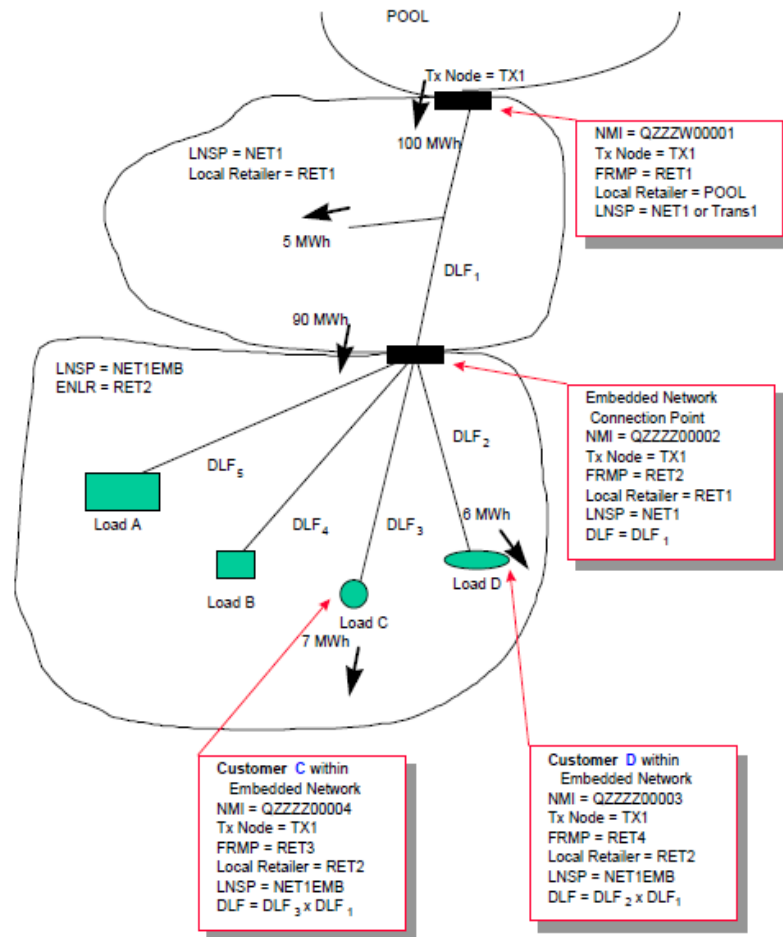
⁽¹⁾ Implementation timeframes provided for indicative purposes only, if any rule is made



- Embedded Networks are a network and market mechanism, overseen by the Australian Energy Regulator which aggregates end users.
- A set of stringent Australian Standards govern power quality as ENs add generation, storage and energy efficiency measures
- Embedded Network Operators own the electrical infrastructure and retail the energy to their tenants either directly or via an Embedded Network Manager



Embedded Networks



Embedded Networks, allow retirement villages, shopping centres, housing estates, educational centres, apartment buildings, industrial complexes, etc. to have exemption as a network service provider and an energy reseller.

The Energy Network Manager (ENM) operates the local electricity distribution system and resells energy to the end users.

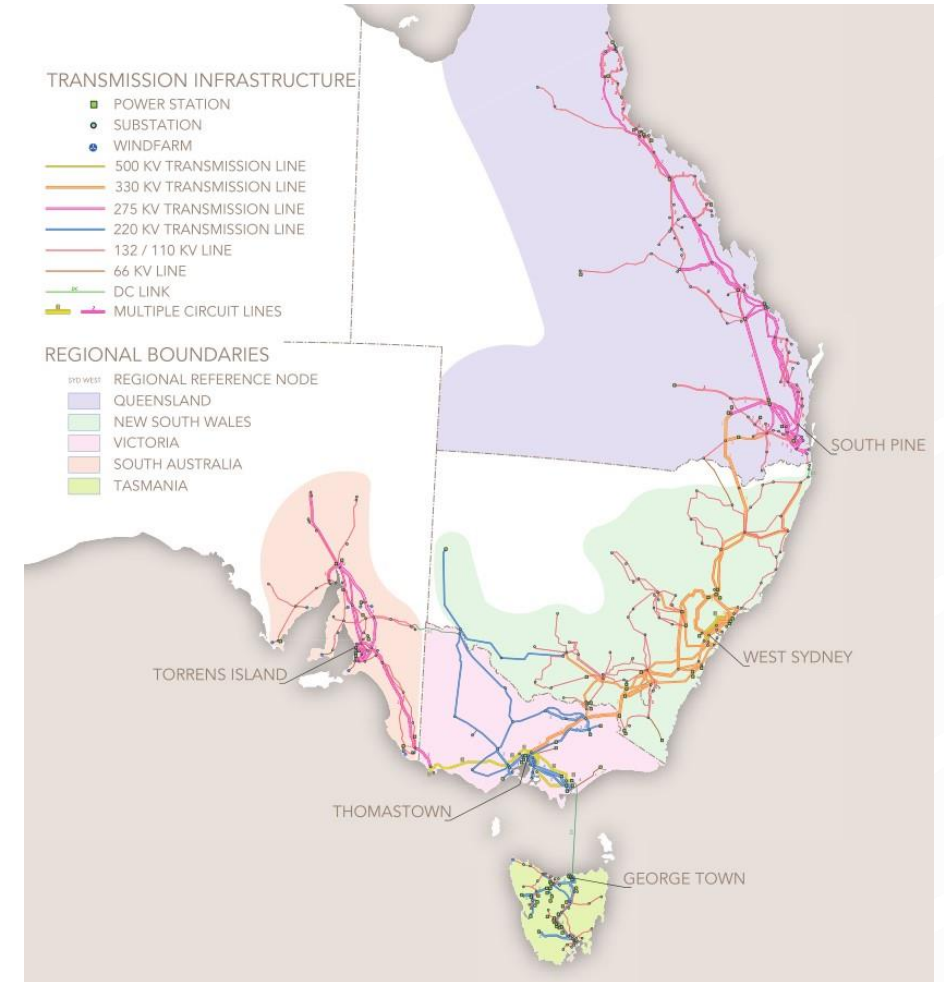


Credit: AEMO

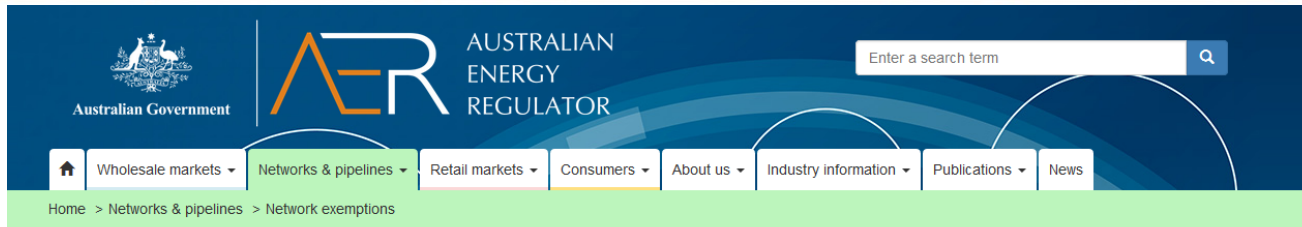


ENs Unlock Market Potential In Australia

- ~90% of the Australian Population lives in an urban centre however there Australian NEM stretches over 5,000km for a population of only 25M
- Australia has some of the most expensive electricity in the world
- 20% of Australian Homes and Businesses have Solar
- ENs breaks the barrier to the tenancy market



Growth of Embedded Networks



Public register of network exemptions

Public register of network service provider exemption applications approved by the AER.

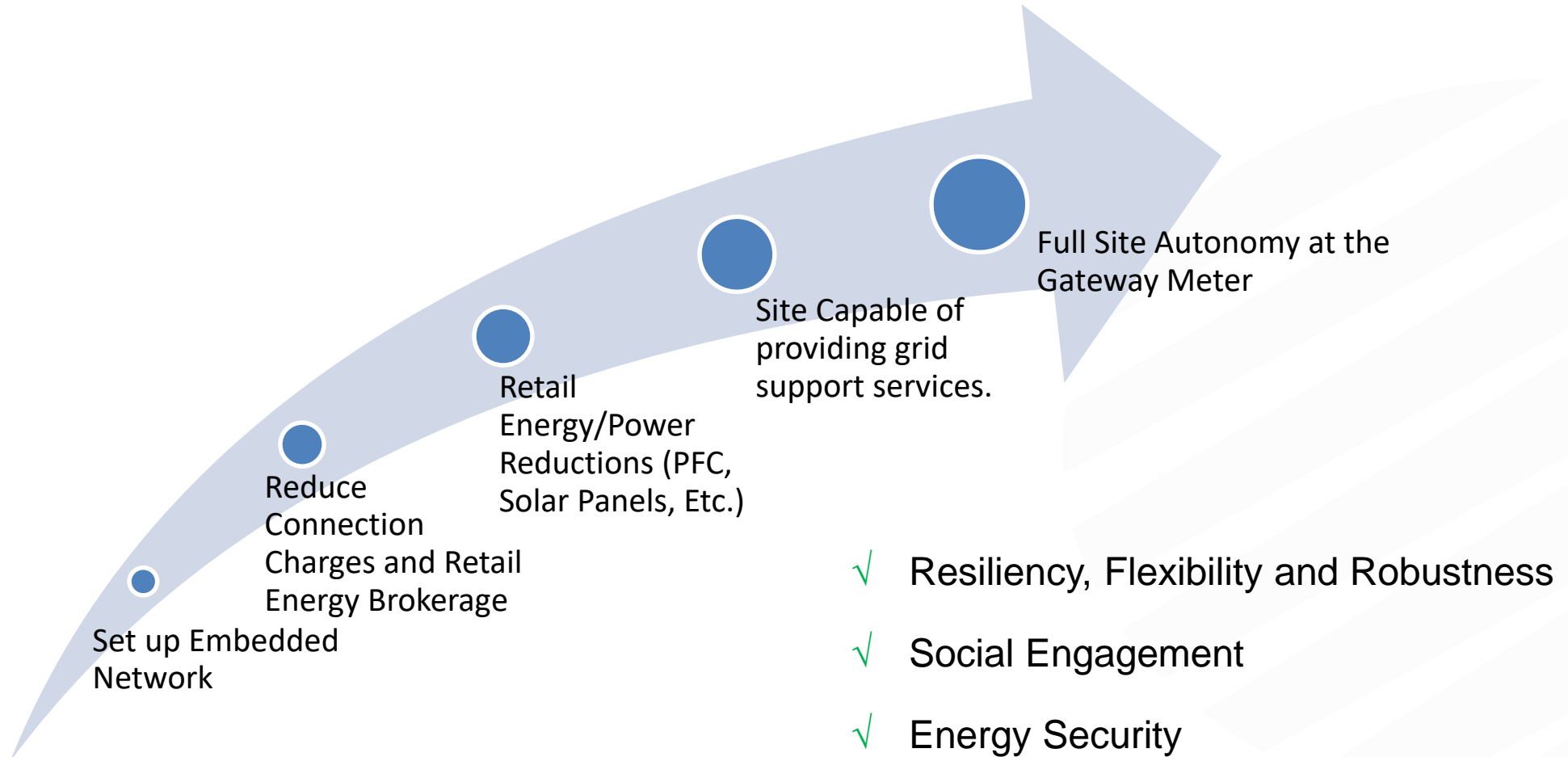
Sector	Title	Exemption	Sector	Segment	Region	Status	Effective date
Electricity 3140	The Trustee for Sanctuary Lifestyle Management Hybrid Unit Trust - Harmon Drive network exemption	NR3	Electricity	Distribution	Victoria	Current	10 Mar 2017
Segment	Canadian Solar (Australia) Pty Limited - Oakey Solar Farm network exemption	NRO2	Electricity	Distribution	Queensland	Current	10 Mar 2017
Distribution 3136	OC Energy Pty Ltd - 401 Hampshire Road network exemption	NR1, NR2	Electricity	Distribution	Victoria	Current	9 Mar 2017
Transmission 9	OC Energy Pty Ltd - 12-18 Martin network exemption	NR2	Electricity	Distribution	Victoria	Current	9 Mar 2017
Region	OC Energy Pty Ltd - 4-6 Station Street network exemption	NR1, NR2	Electricity	Distribution	Victoria	Current	9 Mar 2017
Queensland 1669	OC Energy Pty Ltd - 2 Morton Avenue network exemption	NR2	Electricity	Distribution	Victoria	Current	9 Mar 2017
Victoria 665	OC Energy Pty Ltd - 218 Bay Road network exemption	NR1, NR2	Electricity	Distribution	Victoria	Current	9 Mar 2017
New South Wales 448	OC Energy Pty Ltd - 195 Station Street network exemption	NR1, NR2	Electricity	Distribution	Victoria	Current	9 Mar 2017
South Australia 341	OC Energy Pty Ltd - 187-191 Reynolds Road network exemption	NR1, NR2	Electricity	Distribution	Victoria	Current	9 Mar 2017
Australian Capital Territory 14	OC Energy Pty Ltd - 96 Camberwell Road network exemption	NR1, NR2	Electricity	Distribution	Victoria	Current	9 Mar 2017
Tasmania 5							
Status							
Current 2985							
Historical 155							

Credit: AER

- Over 4000 Embedded Networks have come online in the past 5 years
- You don't need an Embedded Network to reach tenancy customers but it makes it far easier and the engagement is high
- Retailers get a single consolidated contract which carries less risk, owners get an additional revenue stream and end users get reduced energy costs
- ENMs typically bring with them a legal framework, metering/reporting framework and operational framework which unlocks DERs in the tenancy market



The Full Potential of ENs



Unlocking Aggregated Potential

- Embedded Network Managers can play ancillary service markets with a single large site or with many aggregated sites.
- ENs can provide frequency control services, voltage regulation services and demand response services to the grid.
- ENs can perform tariff arbitrage, demand reduction and PV self consumption for the benefit of its end users, the owner or both
- ENs can help networks with congestion relief and with grid infrastructure deferment.



SBS image from Reposit Power

