Institute for Energy Economics and Financial Analysis

Growing the sharing energy economy

How Energy Ministers can support cheaper, faster, decarbonisation through distributed energy resources

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The Energy Transition

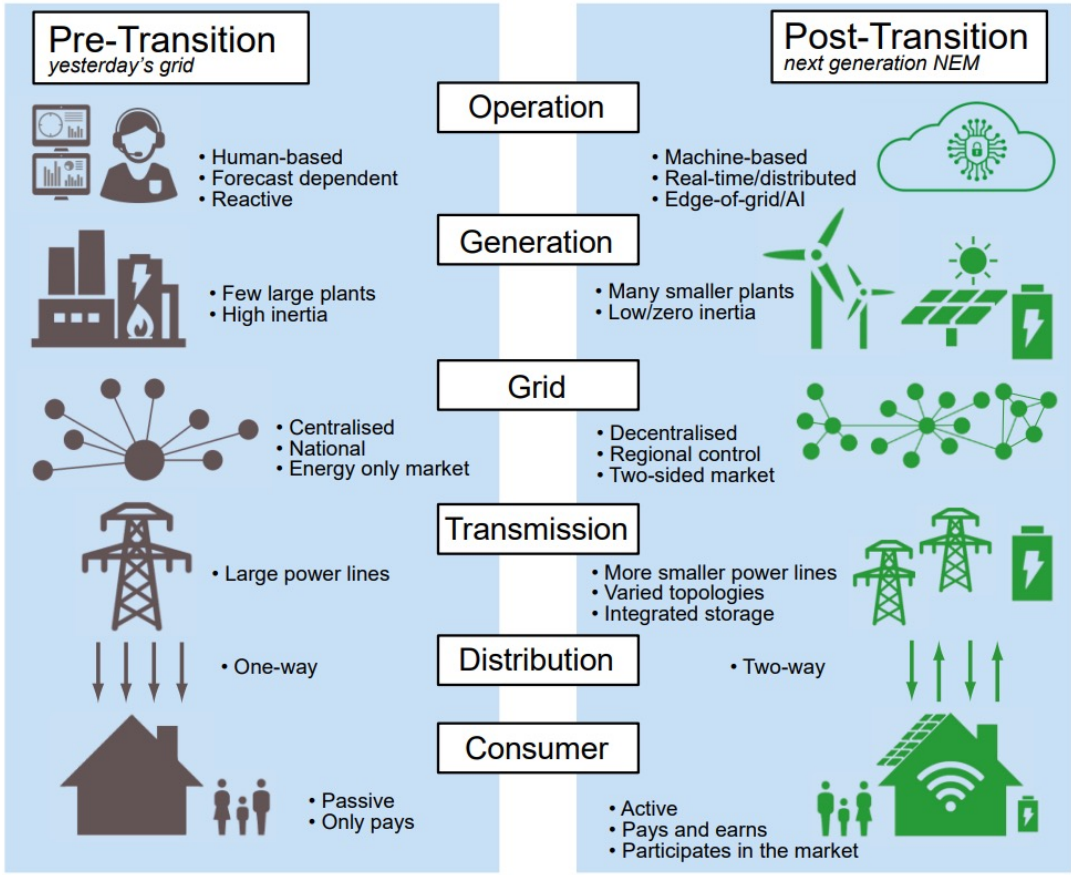
In the NEM so far:

- $25+ billion of household/business investment in Distributed Energy Resources (DER)
- 21.5GW on rooftops
- 14.3GW – 3+ million household rooftop solar systems
- 7.7GW – over 400,000 C&I/non-residential rooftop solar installations, accelerating and large potential (28GW minimum for C&I)
- Over 180,000 household batteries
- Demand response underutilised

Source: IEEFA

But the benefits of DER are still underestimated

Levels of change

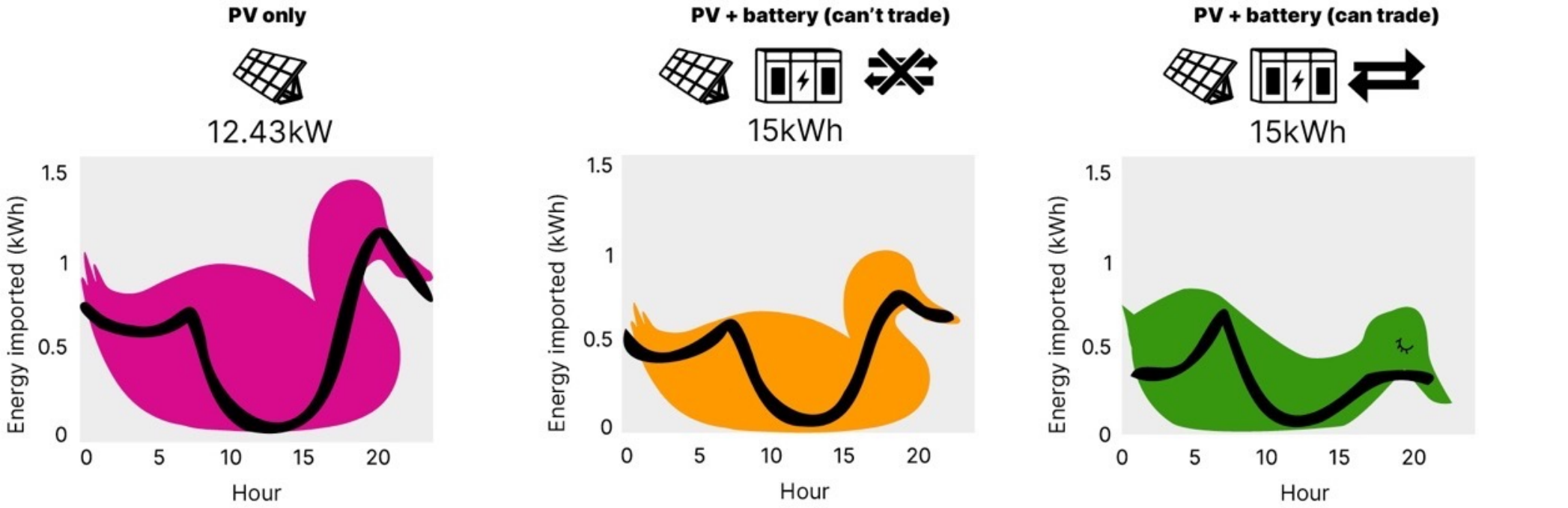


Source: IEEFA

Rooftop PV + batteries can put the duck to sleep

Import from wider grid

For the average household in the modelled suburb



Based on ITP Renewables modelling

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Rooftop PV + batteries puts the duck to sleep

Average Load

PV only

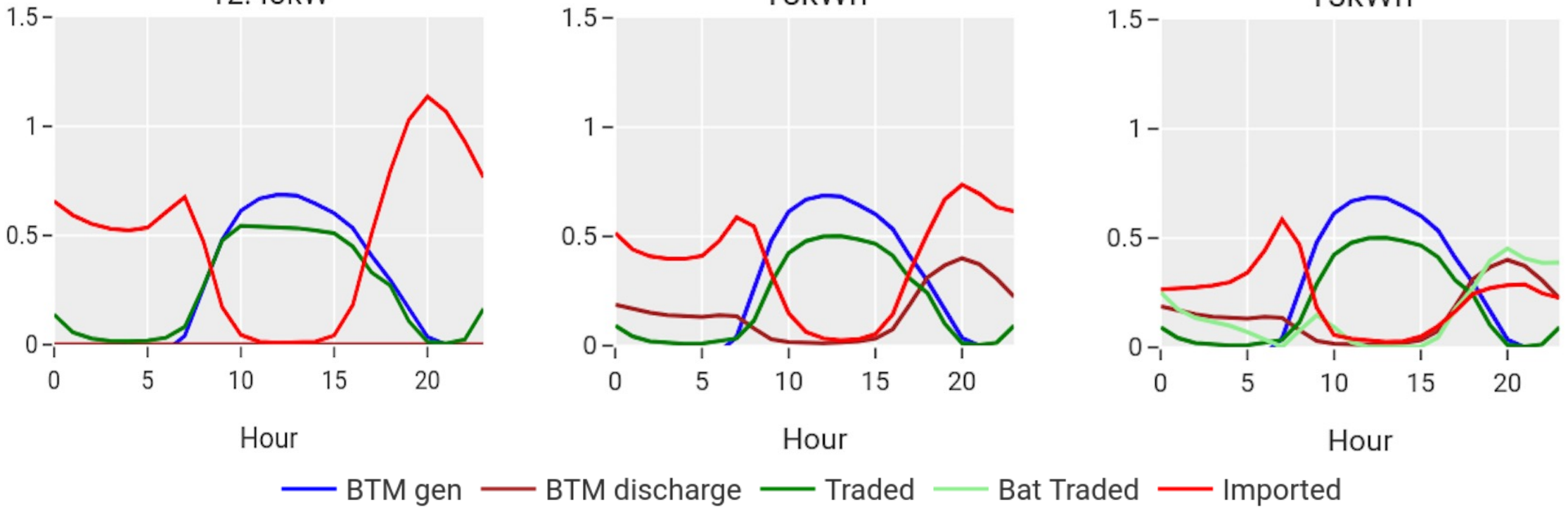
12.43kW

PV + battery (can't trade)

15kWh

PV + battery (can trade)

15kWh



Imports will still be needed from the wider grid

- In general DER increases self-sufficiency at the zone substation level, but this depends on the size of any commercial or other loads
- In areas with low winter PV generation, residential areas will be more reliant on large-scale renewables such as wind power (including offshore) and storage

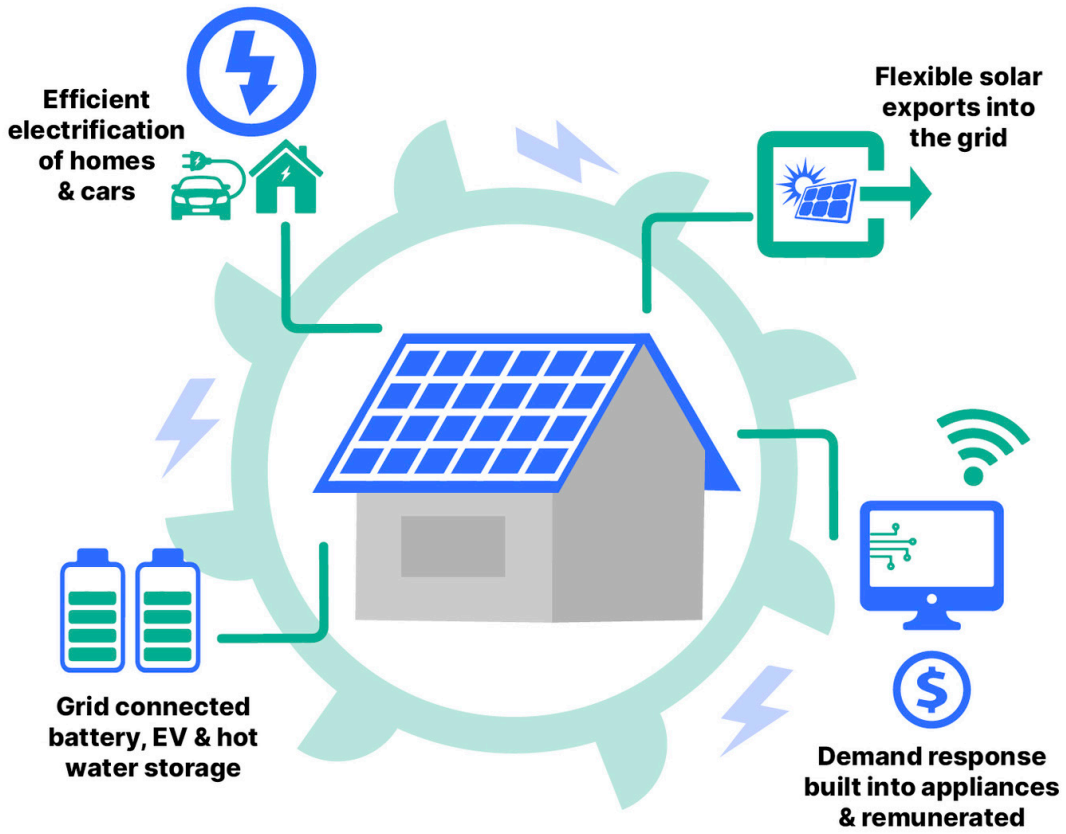
In areas with low PV generation in winter,
it will be very costly for households to go off-grid in urban areas

But this needs further modelling across the NEM

The sharing energy economy

The sharing energy economy can bring many benefits, but needs action to optimise those benefits

Optimising Distributed Energy Resources (DER) means enabling a sharing energy economy



Updates are required to **governance & regulation** to enable this:

- Dedicated body for the smart, timely development of technical DER authority standards
- Revised distribution network revenue regulation to enable DER to provide network services on a level playing field
- Review of energy market governance and its fitness for purpose for the energy transition

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1. Ensure appropriate technical standards are in place

RECOMMENDATION:

Create DER Technical Authority to set a vision for DER technical standards; develop a technical standards work program; monitor, review and set DER technical standards; consider issues related to compliance and enforcement of standards in their development; and providing advice on standards to other government and energy market bodies and undertake related reviews.

2. Remove static constraints on existing solar

RECOMMENDATION:

Agree to **prioritise the implementation of flexible exports (dynamic operating envelopes)** across the NEM and the WEM by 2025

Agree to work collectively to **ensure distribution networks are being operated at voltages** which reduce consumer costs and improve consumer outcomes, especially rooftop solar exports and appliance longevity.

Flexible demand is as important as storage

Residential flexible demand:

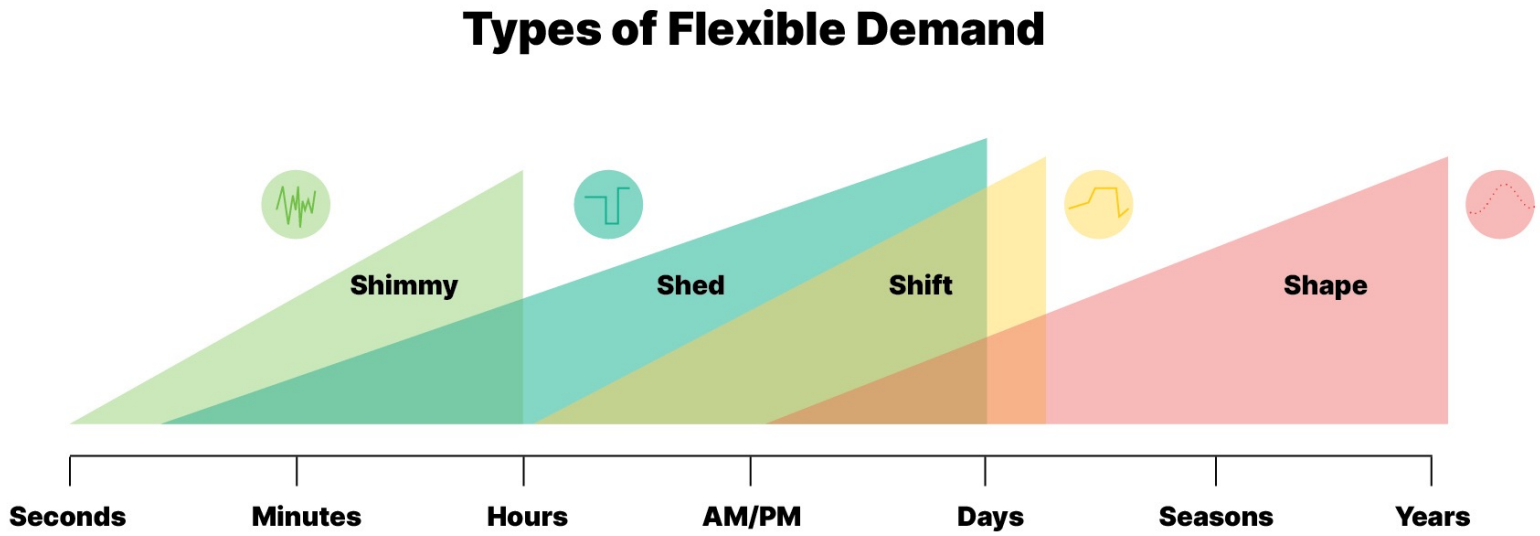
- 850MW Energy Queensland
- Size unknown Origin Spike

C&I flexible demand:

- 350MW EnelX
- 200MW Origin

Potential includes:

- 22GW electrified hot water
- 1.5GW existing industrial uses



		Wholesale Market & Grid Scale Renewable Support	Network Investment Savings	Contingency & Emergency Reserve	Distribution Network Support	Frequency Control Ancilary Services
Shift	Moving demand sporadically in response to an external signal	High	Medium High	Low	Medium Low	N/A
Shape	Moving demand routinely according to a standard long-term pattern	Medium High	Medium High	Low	Medium Low	N/A
Shed	Switching off equipment	Medium Low	High	High	Low	Medium Low (Lower only)
Shimmy	Moving demand over very short timescales in response to an external signal	N/A	N/A	N/A	High	High

Source: IEEFA

Source: IEEFA graphic based on Lawrence Berkley National Laboratory (LNBL) and Race For 2030 CRC

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Flexible demand is as important as storage

3. Unlock flexible demand

RECOMMENDATION:

Make a rule to **include aggregated household demand in the wholesale demand response mechanism**.

Direct AEMO to develop more flexible baseline methods, for both C&I and aggregated residential demand response in line with international best practice.

Agree to **legislate a requirement priority household appliances to be sold with 'demand response capability'** under the Commonwealth Greenhouse and Energy Minimum Standards (GEMS) Act 2012.

3. Unlock flexible demand

RECOMMENDATION:

Agree to develop a **national strategy for flexible domestic hot water** with a priority on considering how best to support both the electrification of gas hot water systems and making existing electric hot water systems demand responsive.

4. Fast-track distributed storage

RECOMMENDATION:

Advocate to the Federal Treasurer that **Commonwealth's Small Business Energy Incentive run for three years**, until 20 June 2026.

Advocate to the Federal Government to **allow aggregated BTM storage (and, where possible, flexible demand) to participate in the Capacity Investment Scheme.**

Consider other ways to support BTM storage, including for reasons of resilience, and including through the SRES.

Agree that the new DER Technical Authority develop **an EV-grid integration workplan.**

5. Create a level-playing field in network services

RECOMMENDATION:

Commission a thorough, independent review of distribution network revenue regulation with the objective of ensure the regulation supports decarbonisation, the integration of DER and improved consumer outcomes, as well as economic efficiency.

6. Ensure fit-for-purpose governance

RECOMMENDATION:

Issue a Statement of Expectations to all energy market institutions (AEMC, AEMO, AER) stating that the National Electricity Objective's emissions reduction objective requires rapid integration of both large and small-scale renewables, storage and flexible demand and ensuring Australia regulation and its implementation is world-leading.

Commission an independent governance review of the energy market governance and its fitness for purpose for integrating DER and the energy transition. This could be completed within six months.

Thank you!

IEEFA Guest Contributor

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