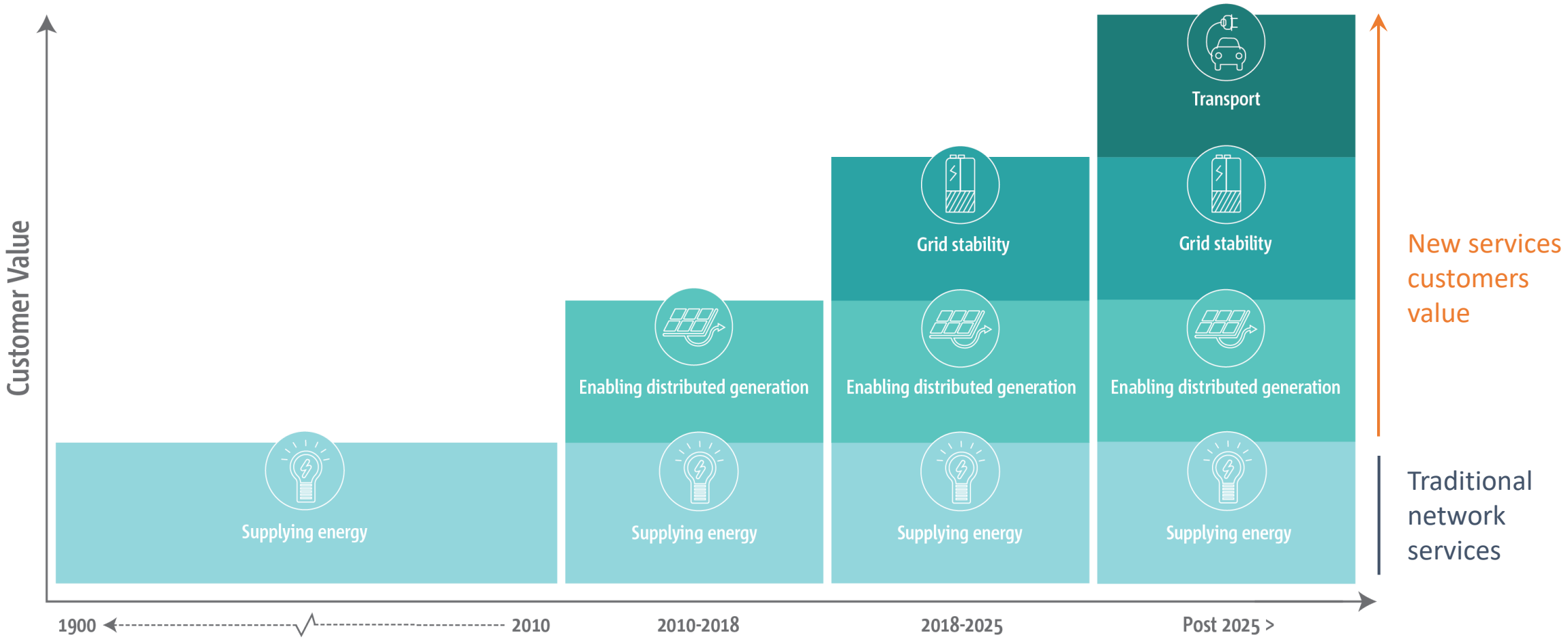
SA Power Networks

Maximising customer value from the network in a high-DER future

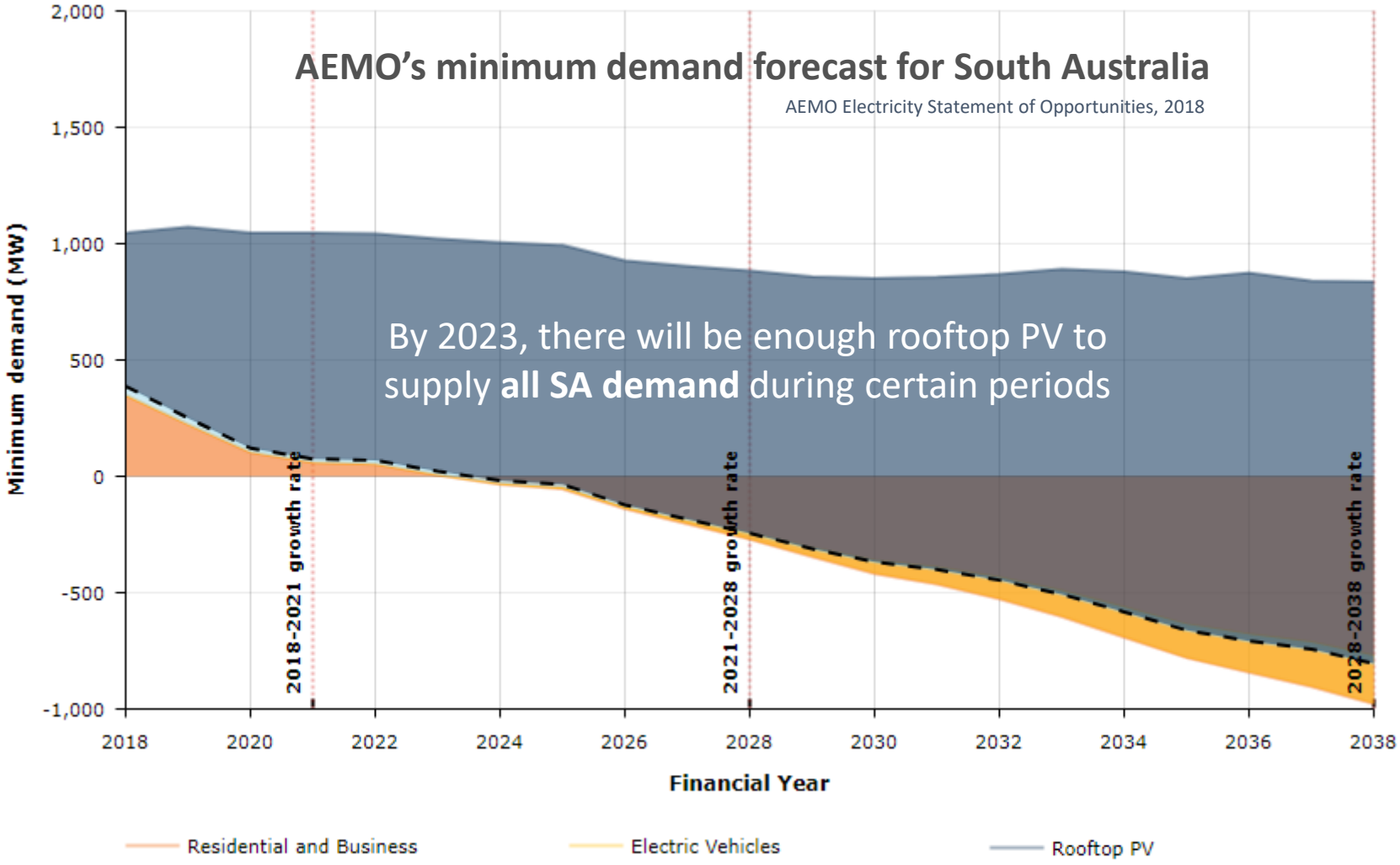
AEMC / ARENA Regulatory DEIP dive, 6th June 2019

The future of the distribution network

- Providing additional value for customers
- More relevant than ever



Distributed resources: integral to the energy mix



Rooftop PV

The **largest generator** in the State

Distribution network now **key source of supply** as well as meeting demand

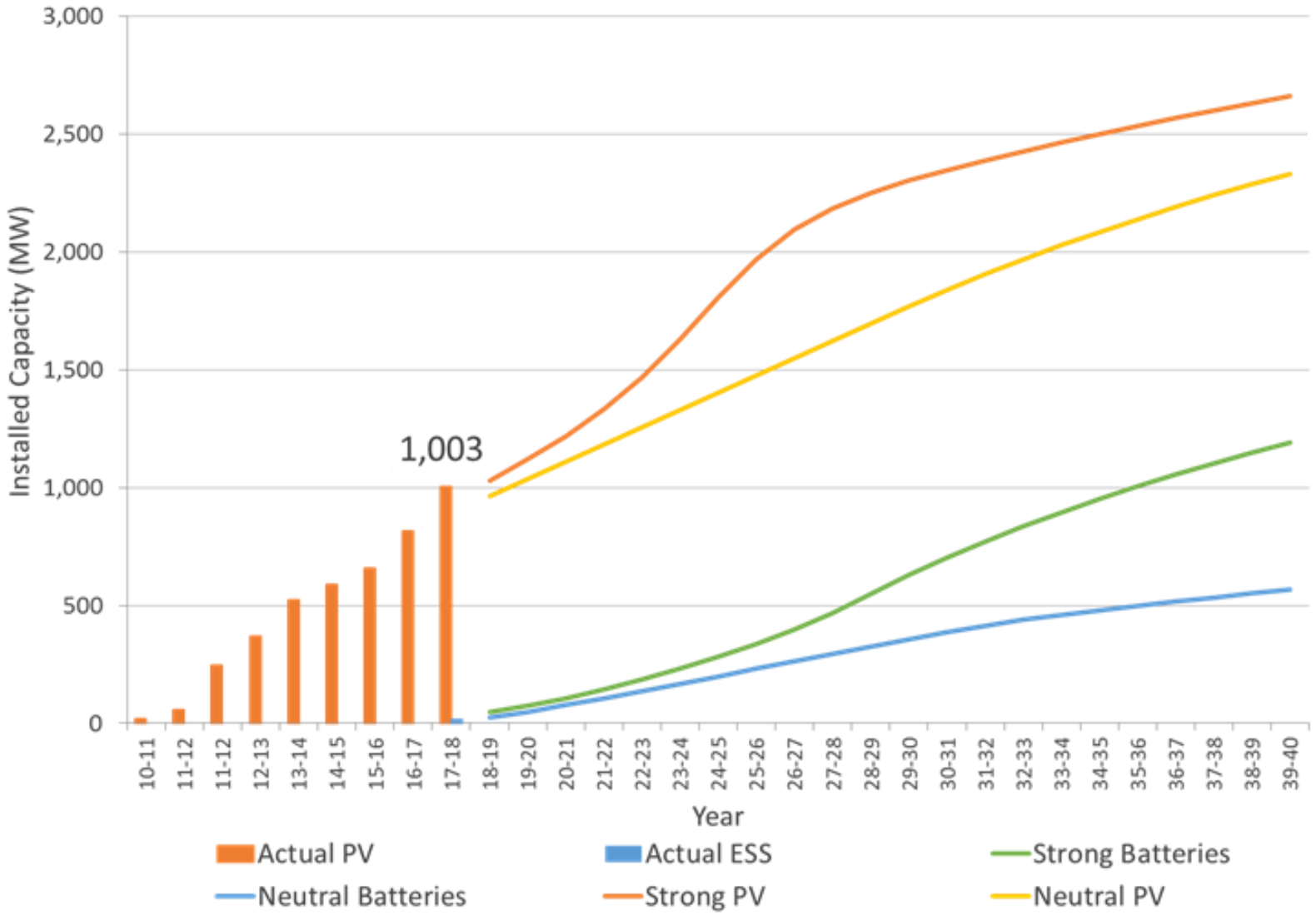
More on the way…

Virtual power plants and **electric vehicles** will expand network use:

- **Demand & supply**
- **Firming & flexibility**
- **Transport**

Transition must be **carefully managed** to capture opportunities and minimise risks

Forecasts - rooftop PV and batteries



20,000 new small-scale PV systems in 2018

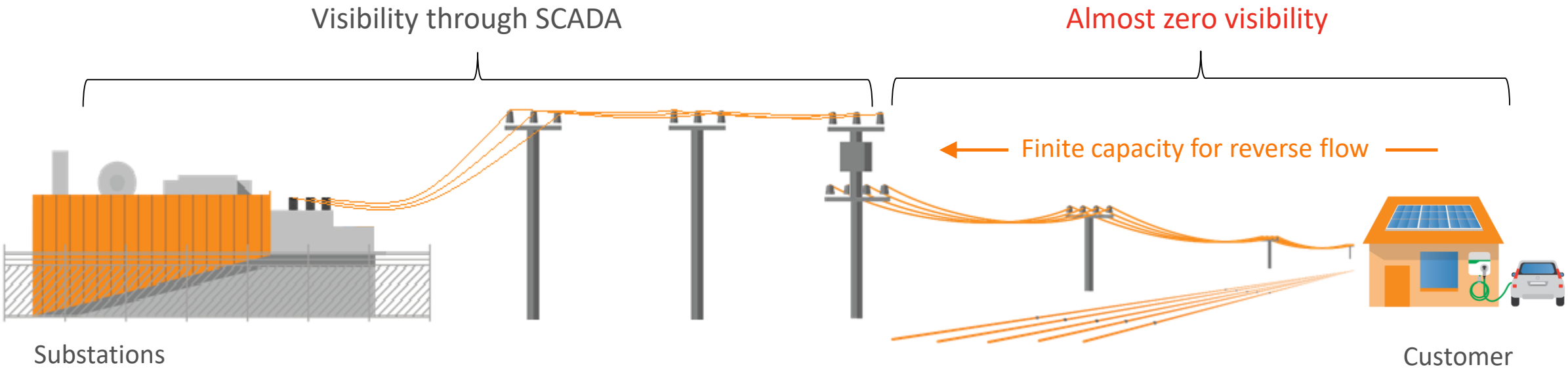
284 MW of new solar in the past 12 months

Up to 90,000 batteries in coming years under SA Government schemes

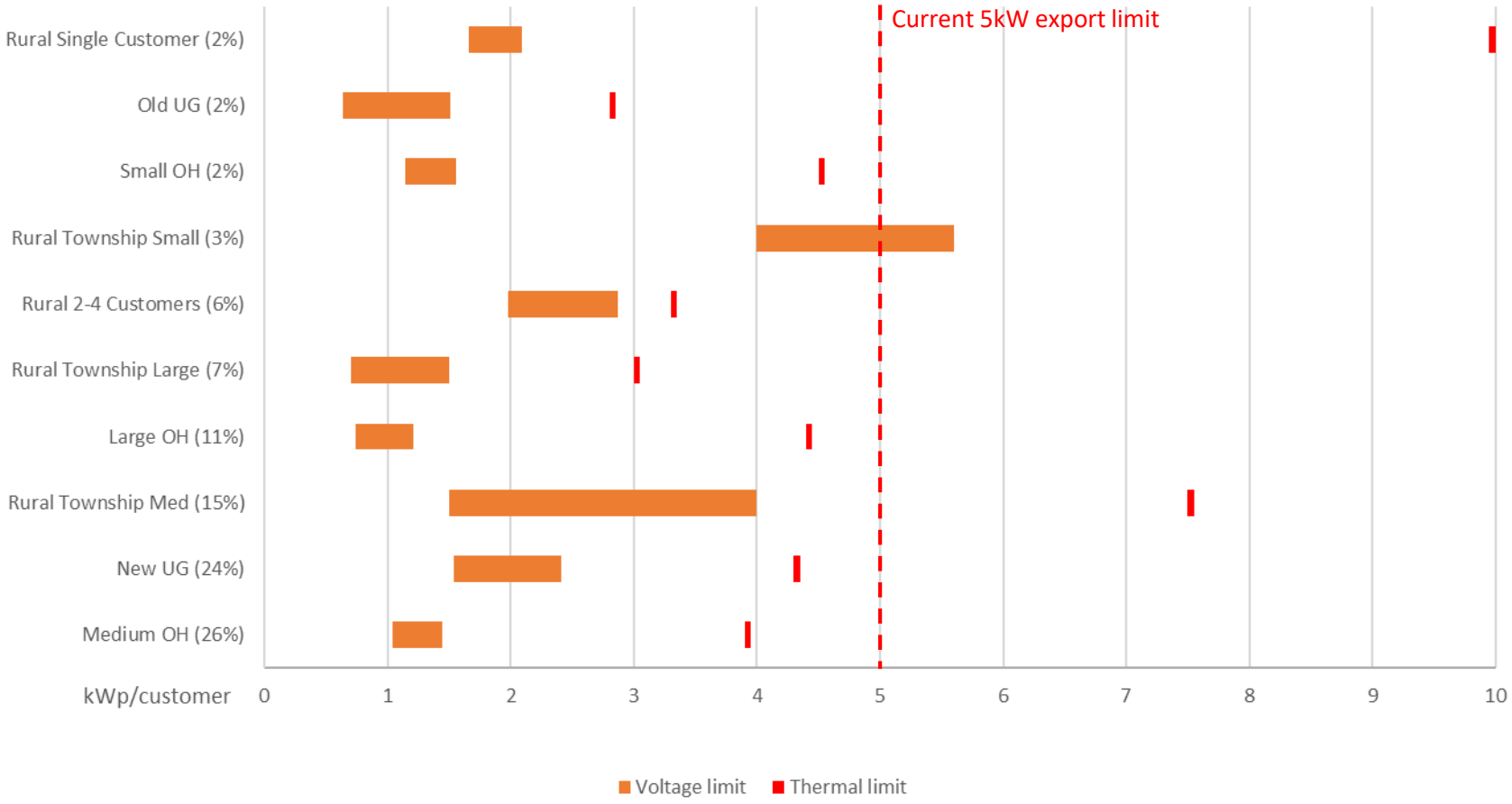
Source: SAPN and AEMO ISP 2018

Challenges in integrating DER

- Our network has a finite **hosting capacity** to transport energy exported from the premises
- We have **estimated the hosting capacity of our LV network** using a statistical modelling tool developed for Ofgem in the UK (EA Technology)
- A key challenge is we have **almost no visibility** of our LV network today

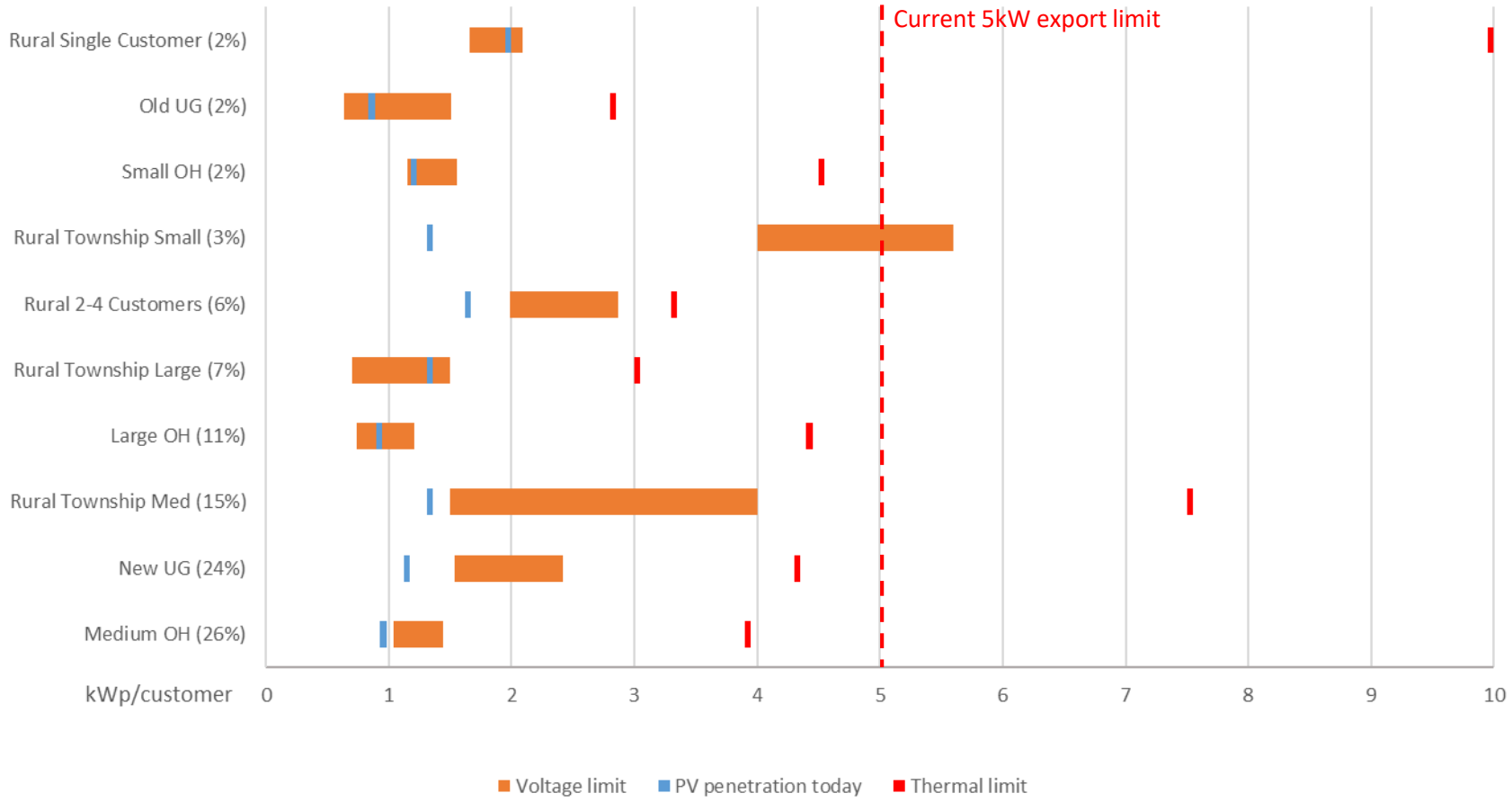


Hosting capacity analysis



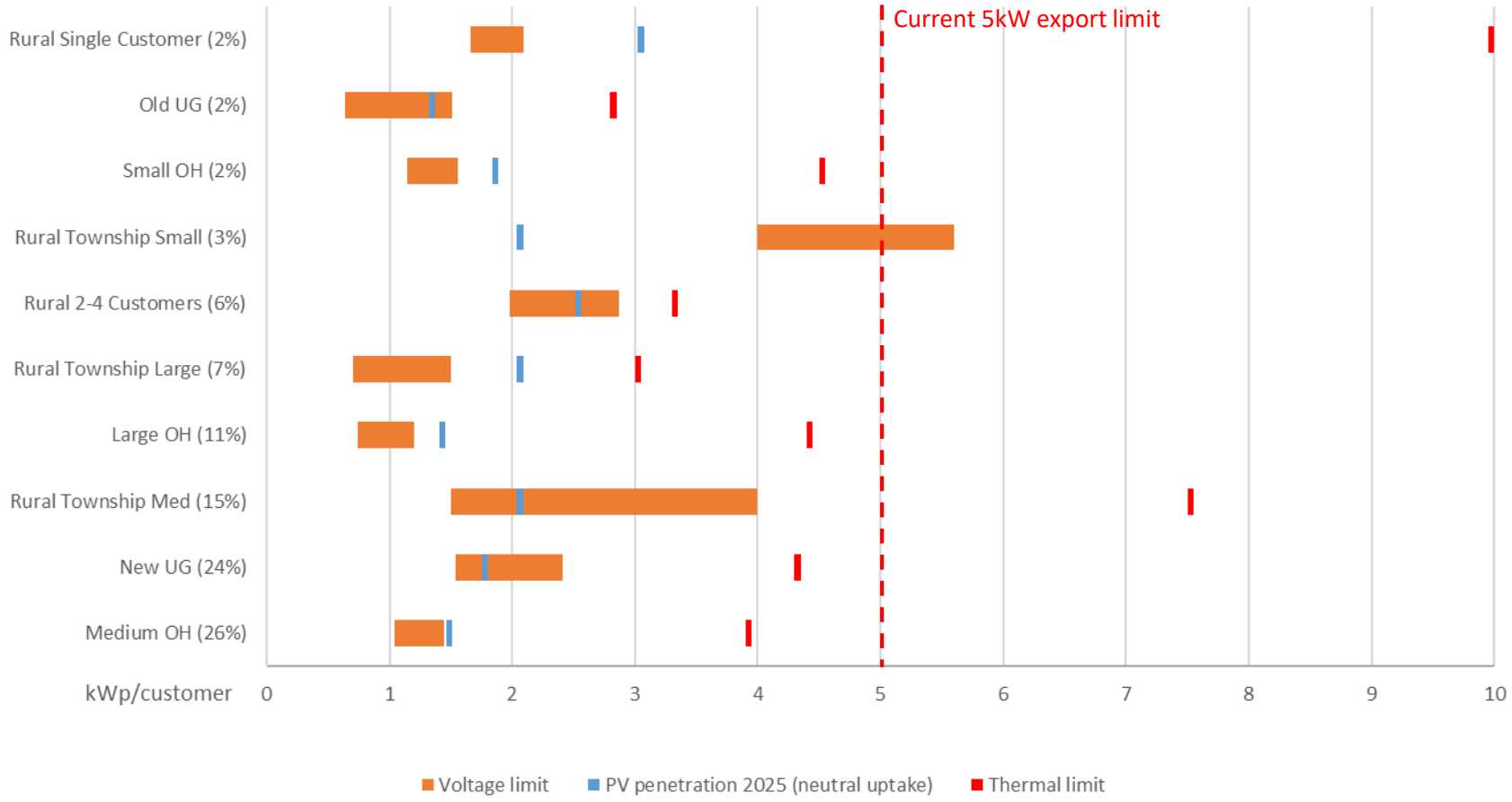
Hosting capacity analysis

- Average PV penetration per network type today

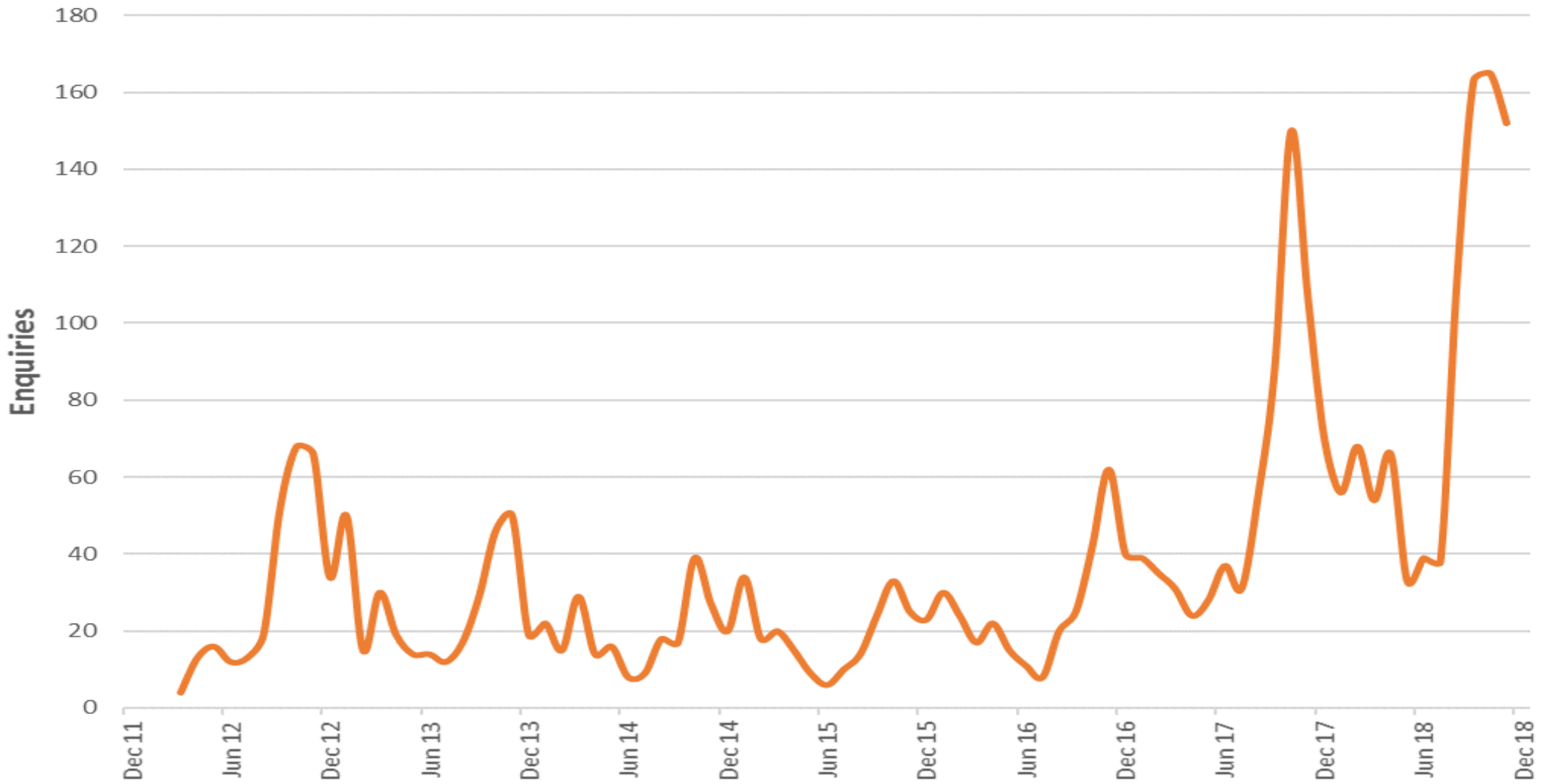


Hosting capacity analysis

- Forecast average PV penetration per network type 2025 (neutral uptake)

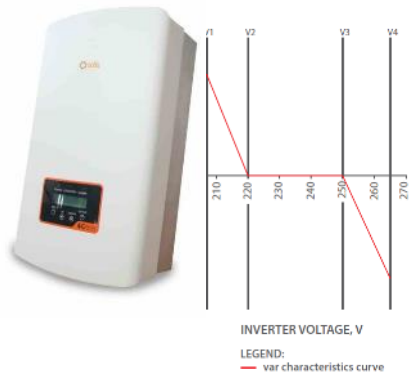


Customer enquiries – high voltage

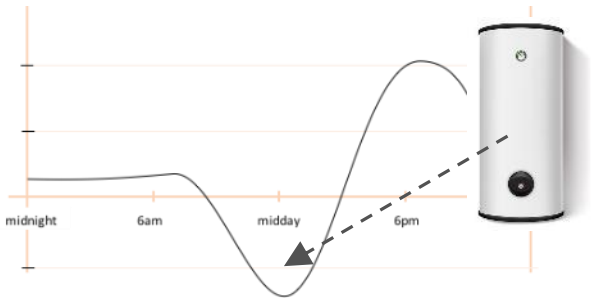


Integrating DER – static strategies

We are actively pursuing strategies to **increase DER hosting capacity**



Smart inverter settings
AS4777.2 Volt/VAR response modes



Shifting controlled load into the solar trough

Tariffs and price signals
Incentives for customers

Improved voltage control and network nominal voltage

What can we do when we reach hosting capacity?

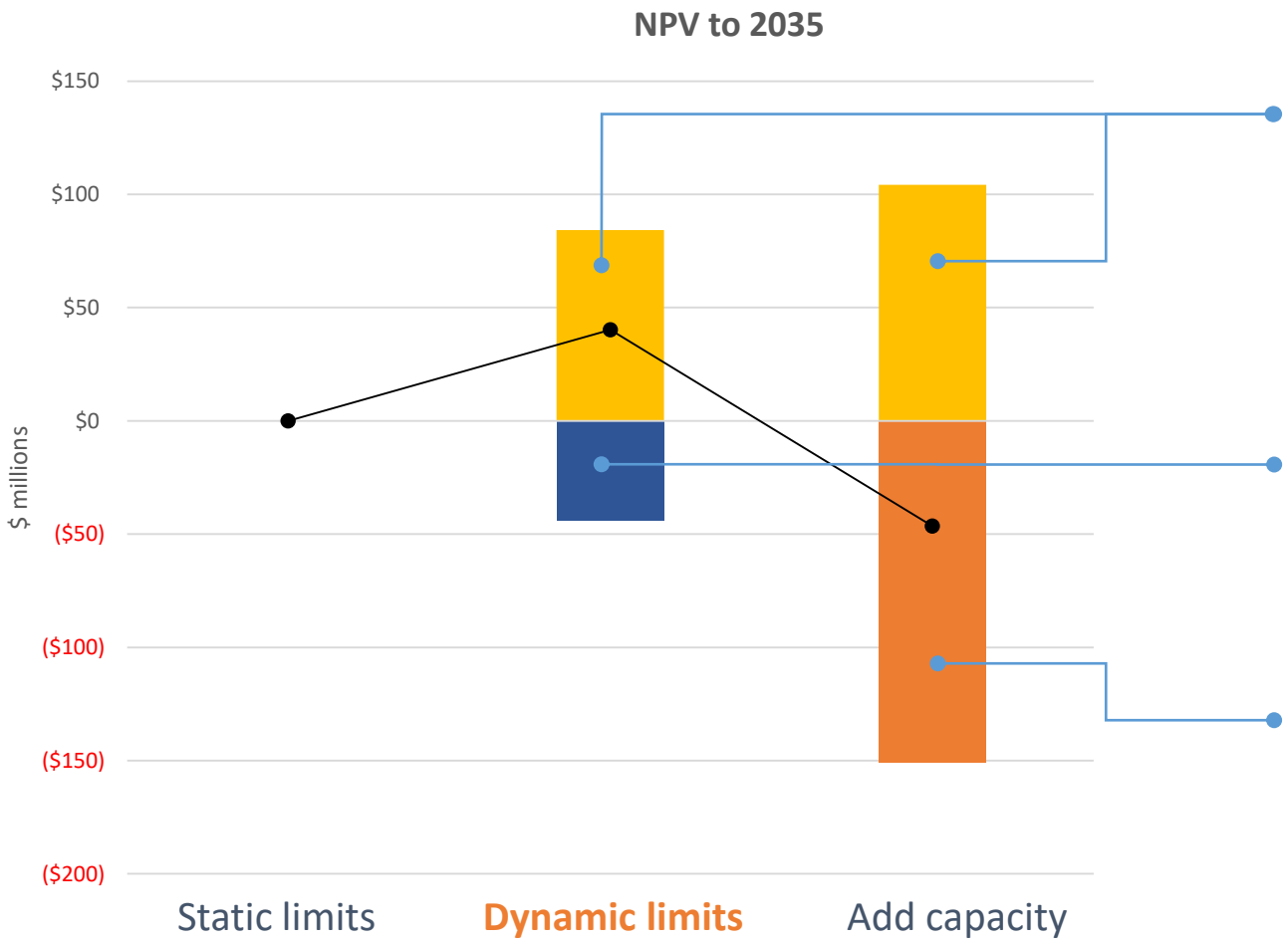
1. **Invest in increasing network capacity to support DER**
   Upgrade the network *or procure demand-side services to support DER growth*

2. **Cap DER at hosting capacity**
   Once ***local*** *hosting capacity reached, limit new systems to zero export*

3. **Dynamic DER management (flexible exports)**
   Manage DER output only on ***rare occasions*** *to remain within network capacity*

Modelling the strategies

To determine the **best long-term option for all customers**



Estimated economic value of exported energy
- Volume (MWh)
- Value ($/MWh)

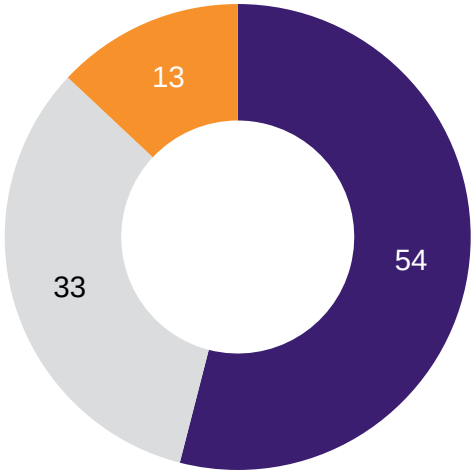
Cost of enabling technologies
- Capex and opex

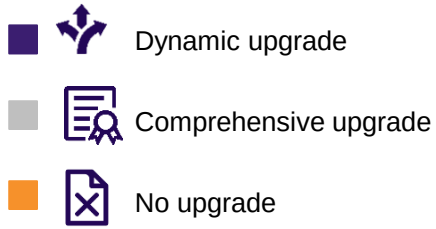
Cost of increasing network capacity

What do our customers think?

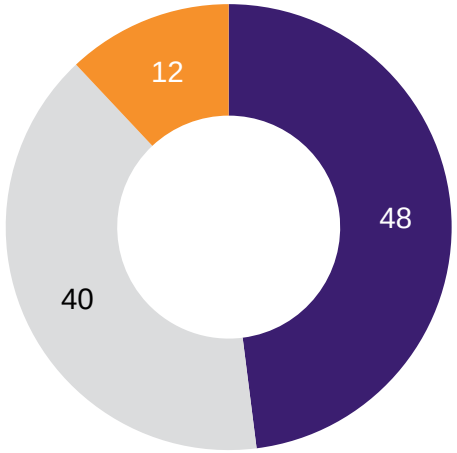
"Dynamic" upgrade ranked as both the **most preferred**, and as **most in the long-term interests of customers** across all customer segments, including solar, non solar and vulnerable customers

Most preferred option
(% selecting each as their top option)





Most in customers long-term interests
(% selecting each as their top option)



Full Newgate Research report available on talkingpower.com.au

Flexible exports

- 2017 **reduced standard export limits** from 10kW to 5kW – likely to reduce further in future
- 2020-25 Regulatory Proposal proposes expenditure to implement **flexible exports**
- Planning for new **flexible export connection option** to be available by 2021

  A **new option** for customers that enables their system to respond to dynamic export limits based on the real time capacity of the network

- Currently undertaking ARENA-funded $2.1m **proof-of-concept** trial with the Tesla / South Australian Government VPP

Key challenges

Although international standards are emerging, **we are at the forefront**

Vendors unlikely to adopt unless national direction and standards agreed

Require clear direction and agreement from policy makers and rule enforcers on DER integration strategies

The longer we wait, the more non-smart DER is connected (220,000 per year nationally)

We must work as an industry to agree on common approaches and standards for DER integration

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