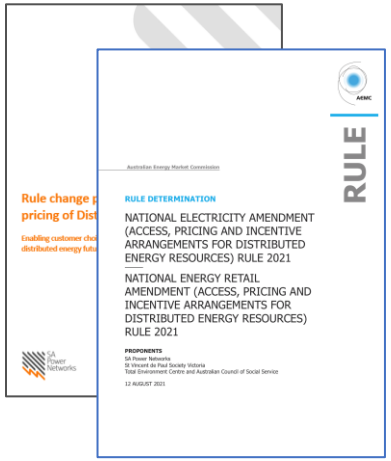
Incentivizing and measuring export service performance

SA Power Networks: insights from a network perspective, and findings from a study undertaken with the RACE for 2030 CRC

SA Power Networks

SA Power Networks' background with export service measures



SA Power Networks was one of 3 proponents to submit a rule change proposal to the AEMC following the 2019 national review of network access and pricing arrangements

Our proposal considered the need for export service measures and the potential for incentives

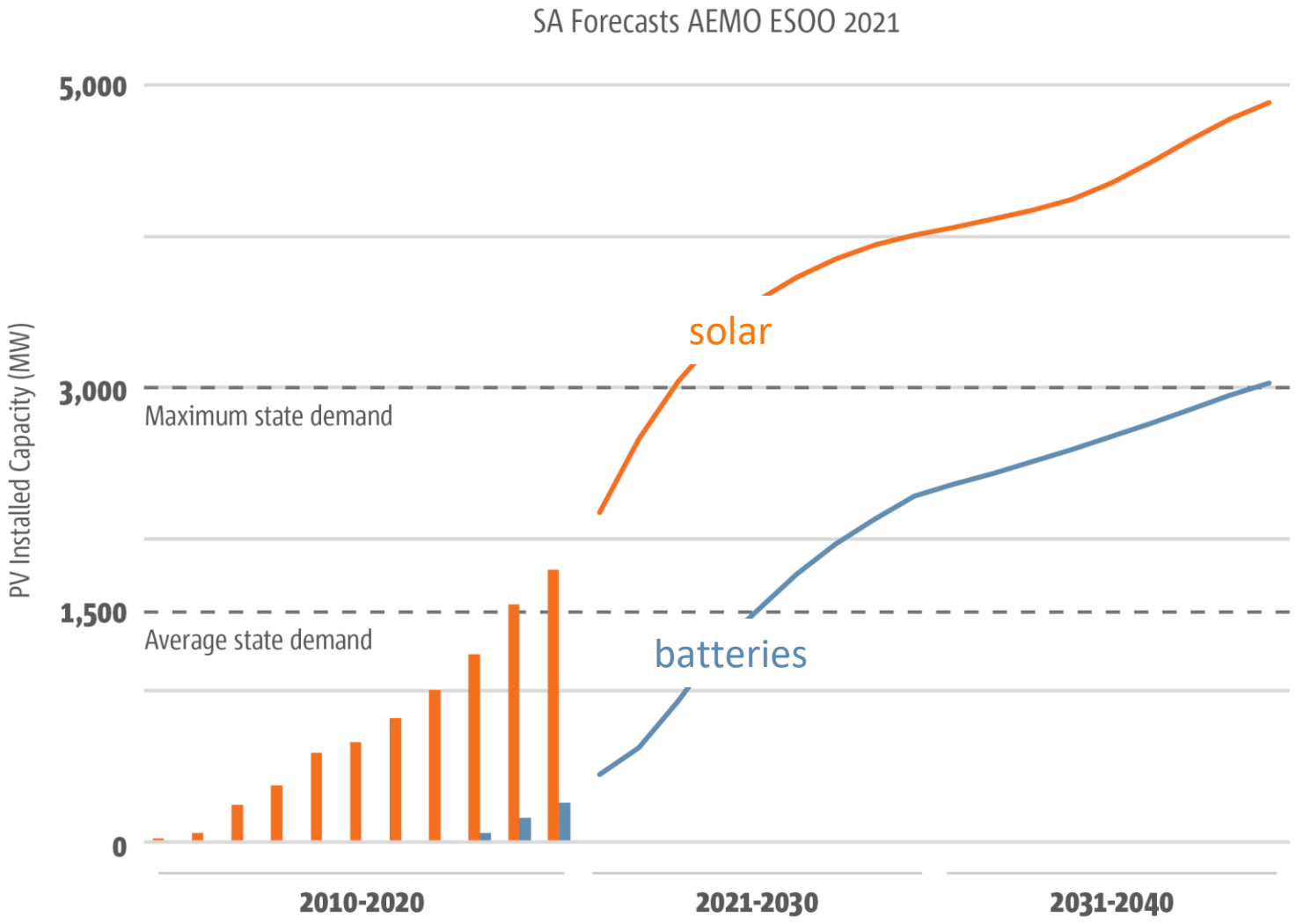
RACE for 2030
RELIABLE AFFORDABLE CLEAN ENERGY

Last year we partnered with University Technology Sydney (UTS) and Essential Energy through the RACE for 2030 CRC to explore and evaluate potential export service measures

The AER team has been on the project reference group for this project, which will soon release its final report

UTS considered measures for 3 use cases: customer engagement, network planning and operations, and **regulatory incentives and benchmarks**

South Australia is leading the way in distributed energy



~300,000 Rooftop solar systems

>1 in 3 customers, world's highest

State's largest generator

The entire SA distribution network is now a net exporter at certain times

Record growth continues

~30,000 Home batteries

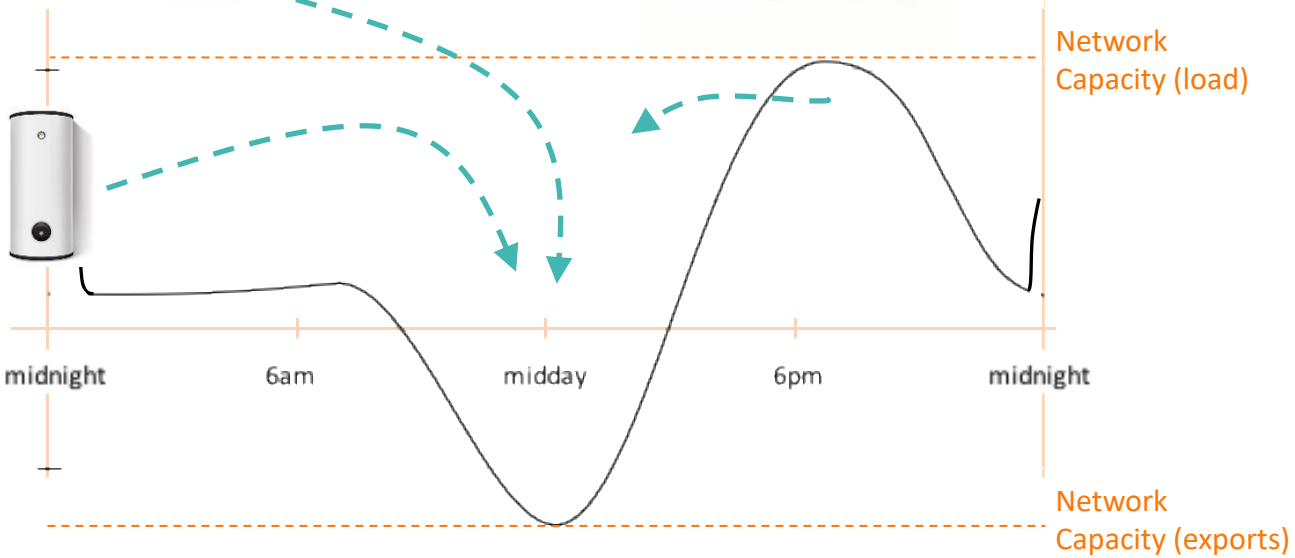
9 Virtual Power Plants operating in SA

Insight #1: managing export capacity requires a combination of approaches

1 **Promoting EV uptake** *and smart daytime charging*

New tariffs and price signals 1
'Solar sponge' ToU tariff launched in 2020

1 **Shifting controlled load into the solar trough**
ToU tariffs and smart hot water trial



1. Soak up daytime solar to reduce upstream load on the network

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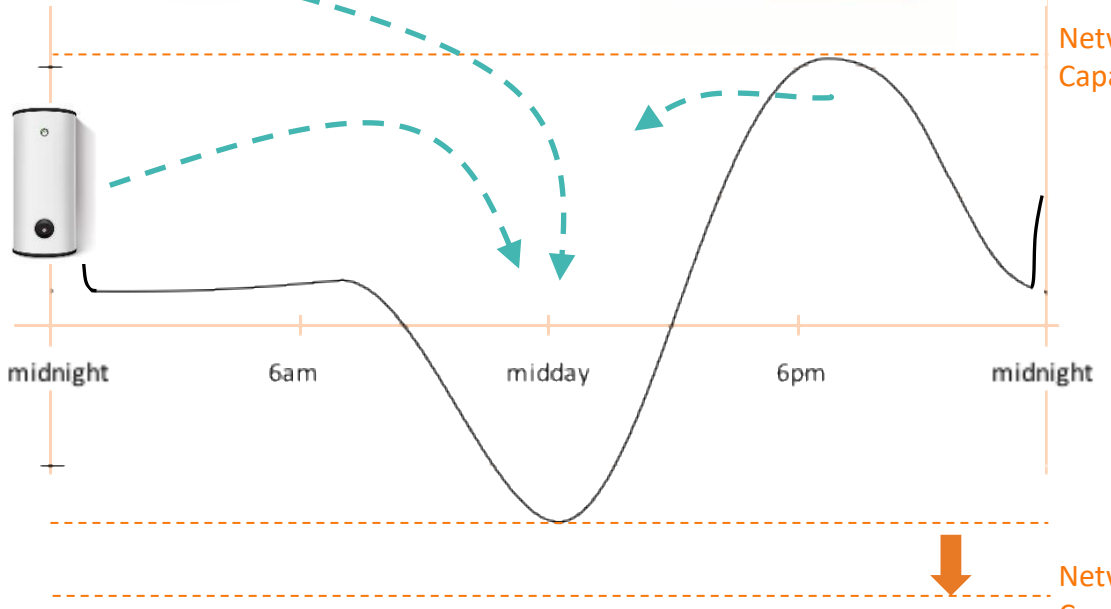

2 **Improving network voltage**
$10 million program upgrading 140 zone substations in 2020-21

1. Soak up daytime solar to reduce upstream load on the network

2. Increase total upstream capacity

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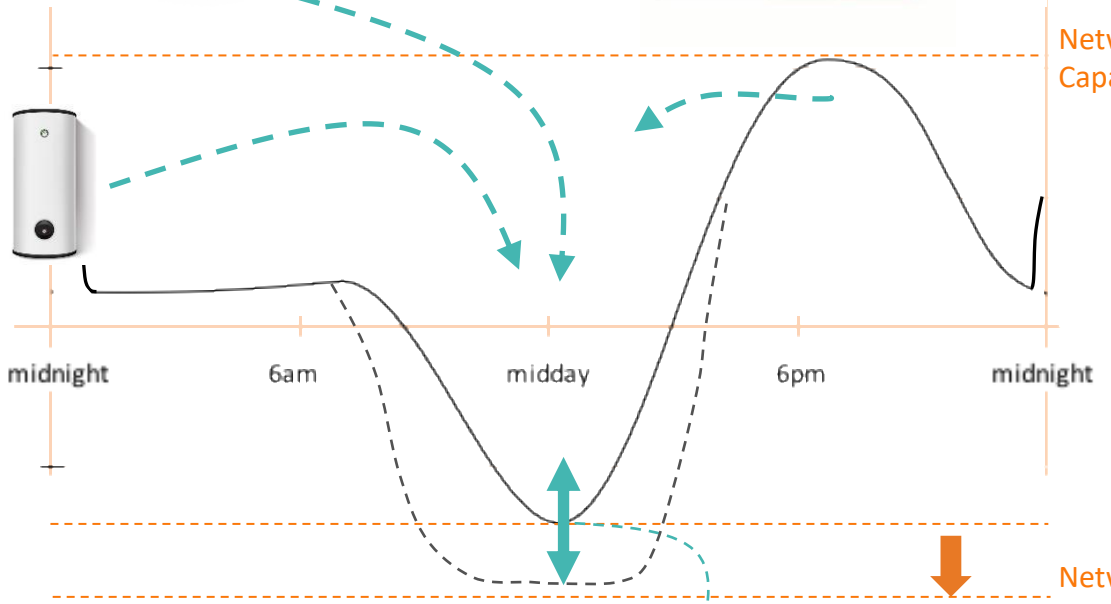

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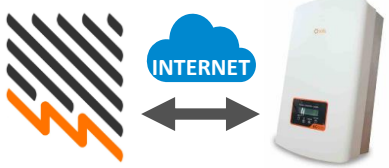
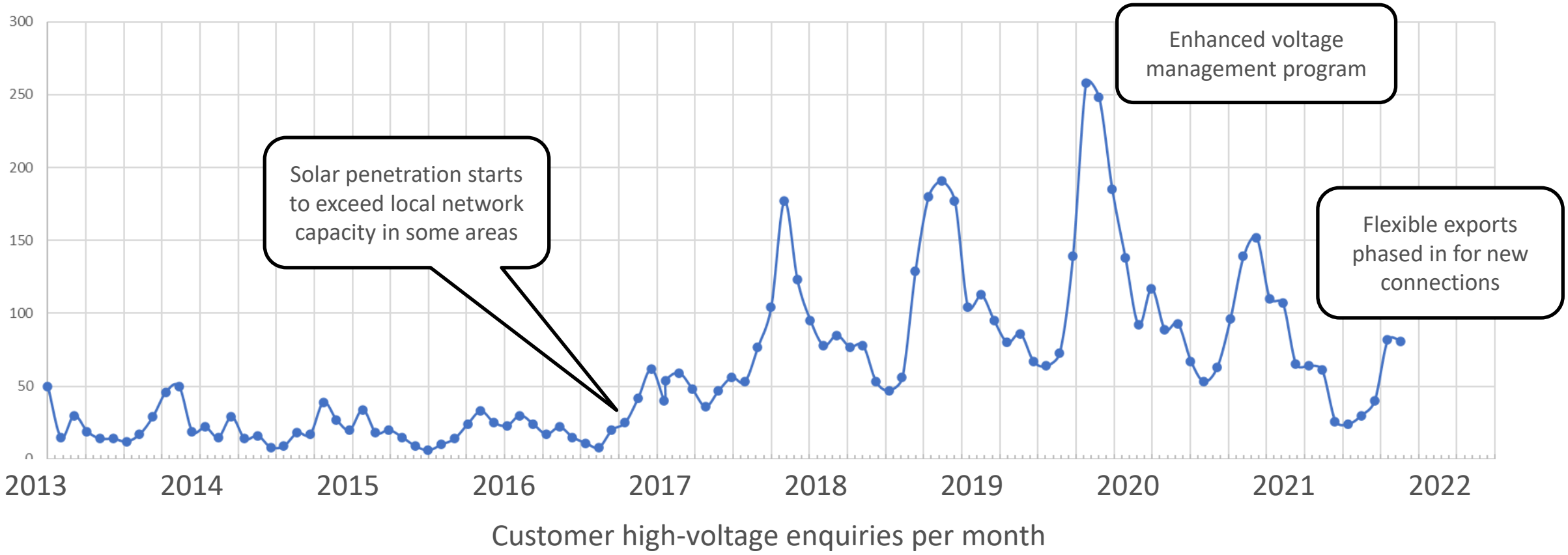


3 **Flexible export limits**
$30 million program 2020-25 to activate smart inverters to operate dynamically within available capacity

3. Increase access to available upstream capacity

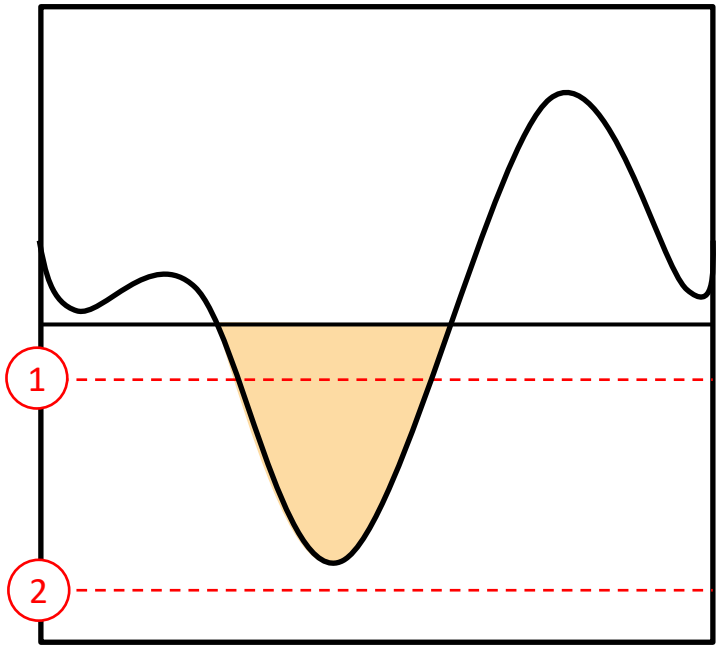
Insight #2: export curtailment due to inverter over-voltage unlikely to be material in future

- Increasing incidence of inverter tripping due to high voltage from 2017
- Became a concern to customers, although studies such as CANVAS found that financial impact was minimal for most
- After peaking in Spring 2019, monthly high-voltage enquiries have reduced dramatically
- This is as a result of multiple interventions, but most notably ‘enhanced voltage management’
- Flexible exports (dynamic export limits) enables ongoing PV uptake without creating new voltage issues

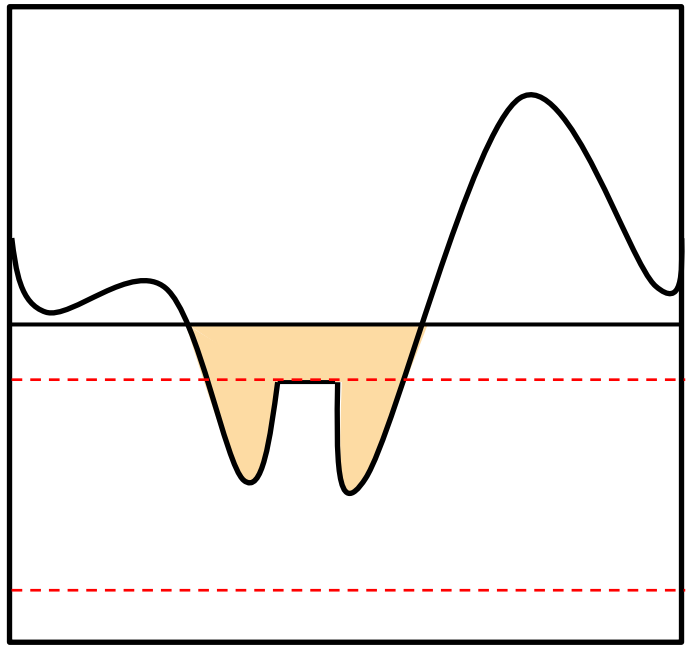


Insight #3: flexible export limits will become the norm

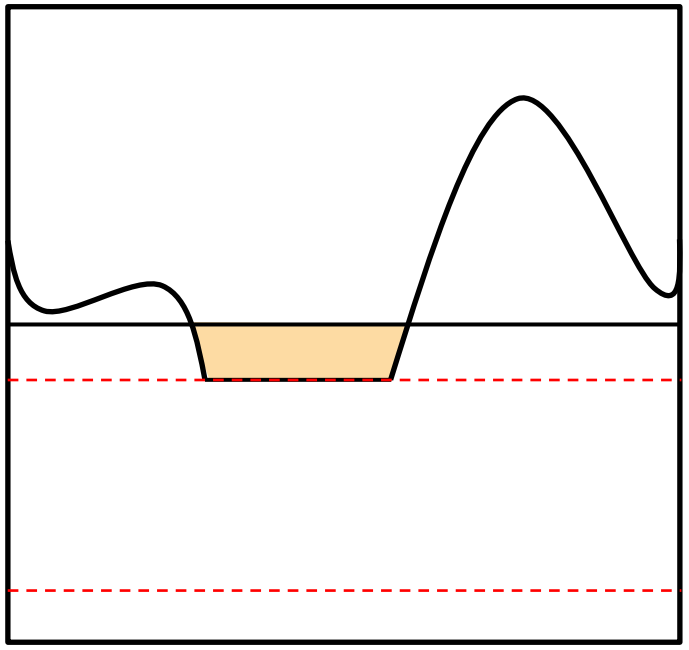
- Local network constraints are **important and must be managed** but they are **infrequent and short-lived**
- There are **compelling benefits** to flexible (dynamic) export limits compared to static limits



Normal day - flexible



Spring minimum demand day - flexible



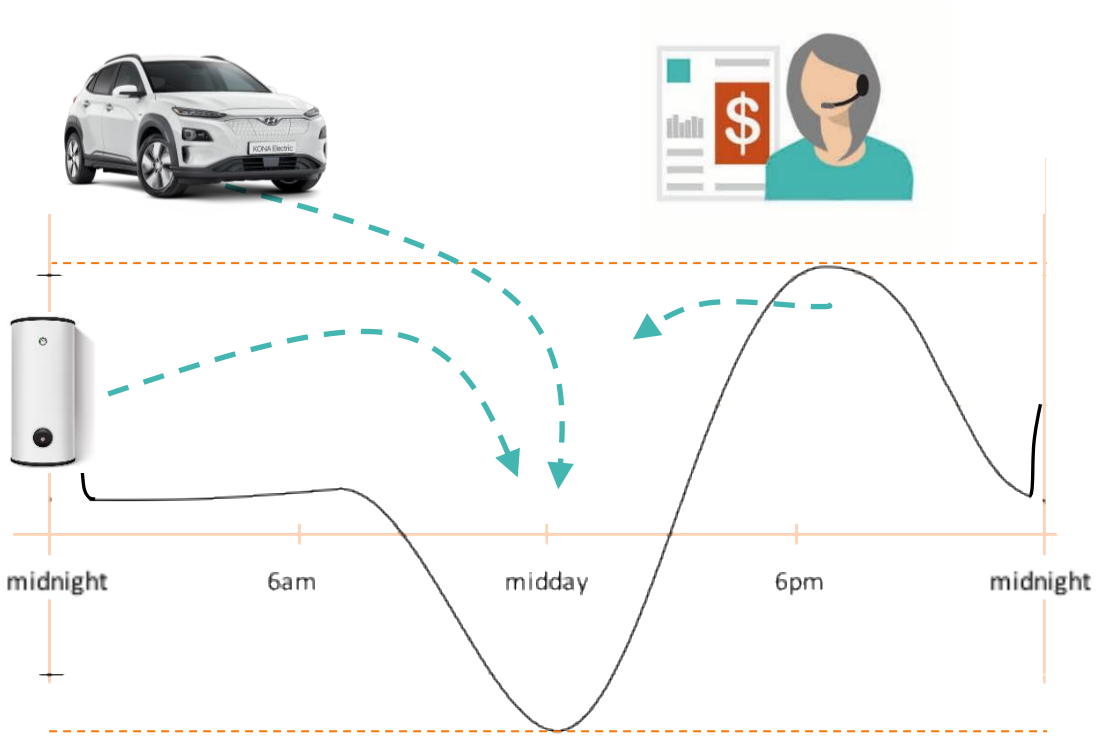
Every day - fixed

1 Spring minimum export limit

2 Typical export limit

Insight #4: solar self-consumption should be encouraged

- We would not want incentives based solely on the **amount of energy exported** because it is efficient to encourage and reward customers for shifting loads into the daytime to increase their solar self-consumption



Measuring level of service

We have been working with the University of Technology Sydney through the RACE for 2030 CRC to explore the best way to measure and express service levels for DER customers.

Amount of energy curtailed

- How much energy that could have been generated was lost because the network did not have enough capacity?
- Aligns with AER CECV

- Can't measure directly (although inverter telemetry helps)
  - Need to estimate sunshine
  - May need to estimate household load

Total curtailed energy from rooftop solar in 2022 was x MWh, representing an economic value of $y

Duration of full export access

- How often was my system limited during the year?

- Easier to measure, including for individual customers
  - Any interval when they hit their flexible export limit

In this area, solar customers received an average export service level of 99.5%, meaning their systems were export-limited less than 0.5% of the time

Total utilised CER generation

- Total volume of energy produced by CER
- Could be expressed as kWh / KW installed capacity

Total energy produced by rooftop solar in 2022 was x MWh

- Can measure from inverter, or dual element metering
- Captures 'total value' whether self-consumption or export
- encourages efficient enablement of solar and avoids potential perverse incentive to maximise exports

Export service levels achieved

- How often did customers receive their agreed service level?

Customer service levels were met 99.5% of the time in 2022

- Takes into consideration customer preferences and choice

Customer complaints

- How many customer complaints were received related to export service level performance?

In September 2021, SA Power Networks received 0.2 complaints per 1,000 solar customers in relation to export service performance, a 50% decrease on the same time in the previous year

- Easy to measure
- Directly reflects customer satisfaction

Insight #5: we will likely need to consider measures in combination

Summary

Insight #1: managing export capacity requires a combination of approaches

Insight #2: export curtailment due to inverter over-voltage unlikely to be material in future

Insight #3: flexible export limits will become the norm

Insight #4: solar self-consumption should be encouraged

Insight #5: we will likely need to consider measures in combination

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