Why is managing voltage rise so important?

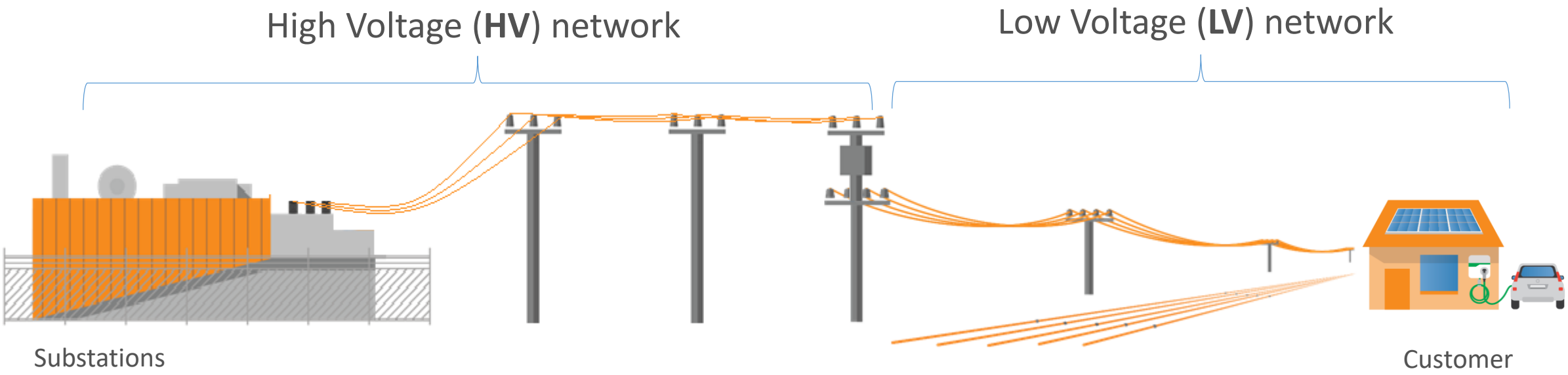
All Energy, October 2019

SA Power Networks

Travis Kauschke

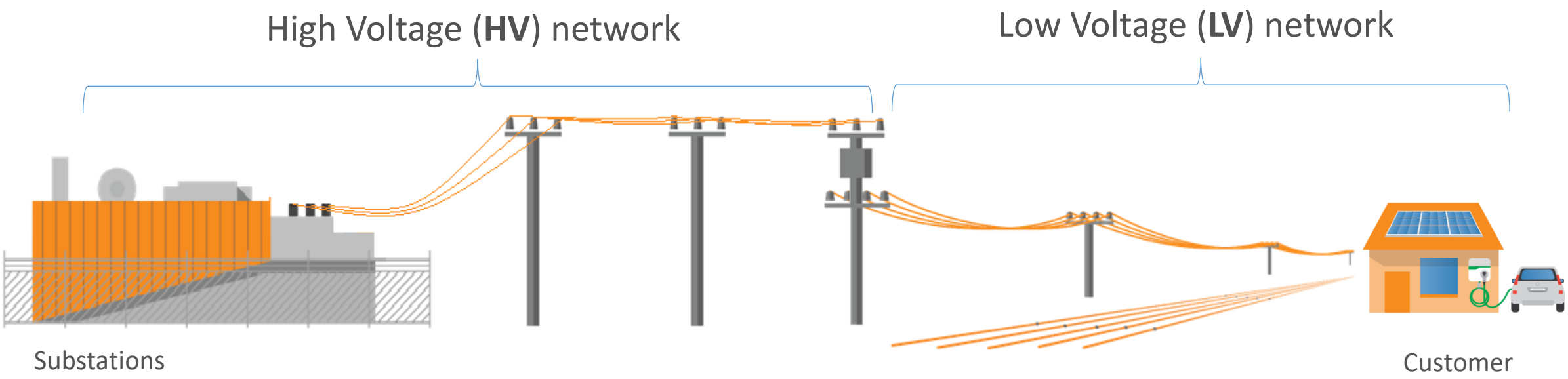
What are the drivers?

- Power prices have become political and sensational
- Customers are wanting to have more control and take part in the electricity market
- Government rebates are driving up demand – expected 650,000 new solar customers in Victoria over the next 10 years, increasing total generation capacity to 2.6GW
- Networks have a statutory obligation to maintain supply voltages



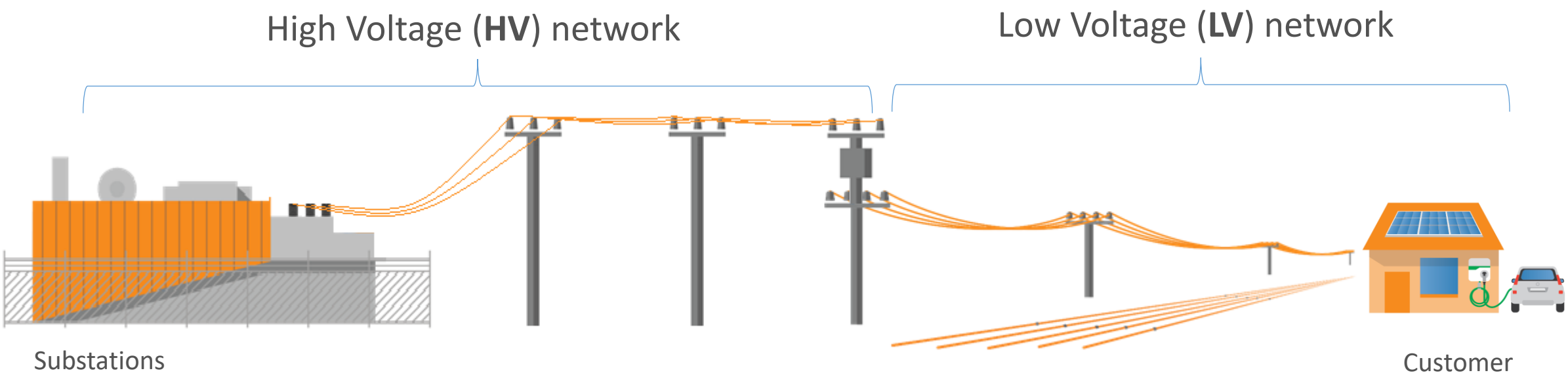
What are the issues?

- Power fed into the grid increases voltage
- Much greater dynamic range that the network must support
- The distribution network was designed for one-way power flow / voltage drop
- Intermittent nature of PV means rapid changes in voltage
- Networks are having to export-constrain customers, which is unpopular
- High rates of non-compliance to connection standards impacting customers



What are the impacts?

- The inverter switches off to prevent damage to customer equipment
- Inconsistent performance of the customer's PV system and unsatisfied customers
- Installer and Network call outs to investigate – opex and /or augex expenditure



Current trends

Small scale rooftop PV systems (<30kW)

- 2017: 16,000 systems, 115 MW
- 2018: 20,000 systems, 163 MW
- 2019*: 25,000 systems, 188 MW

Commercial rooftop PV systems (30-200kW)

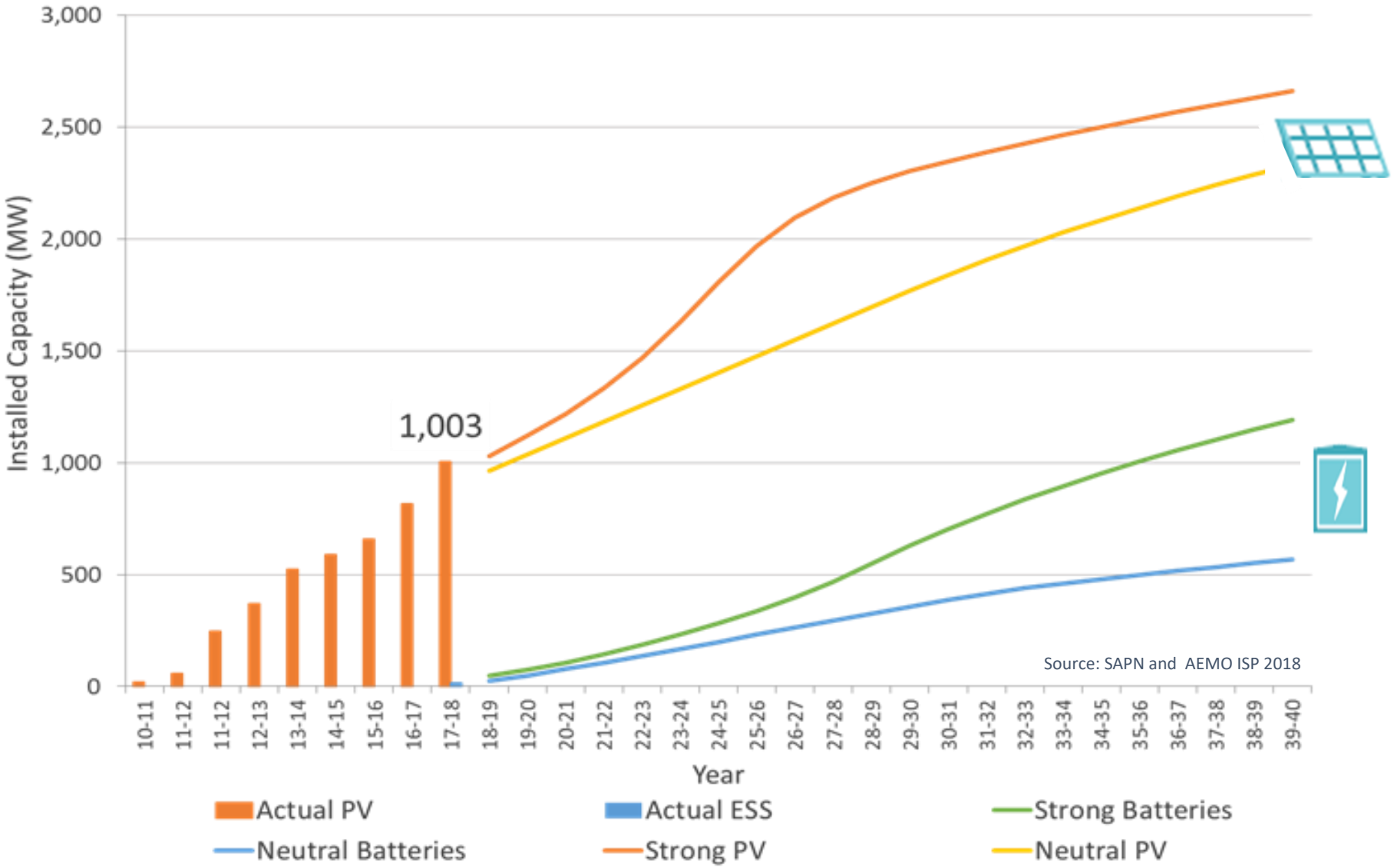
- 2017: 90 systems, 7 MW
- 2018: 270 systems, 24 MW
- 2019*: 250 systems, 22 MW

Large embedded generation systems (>200kW)

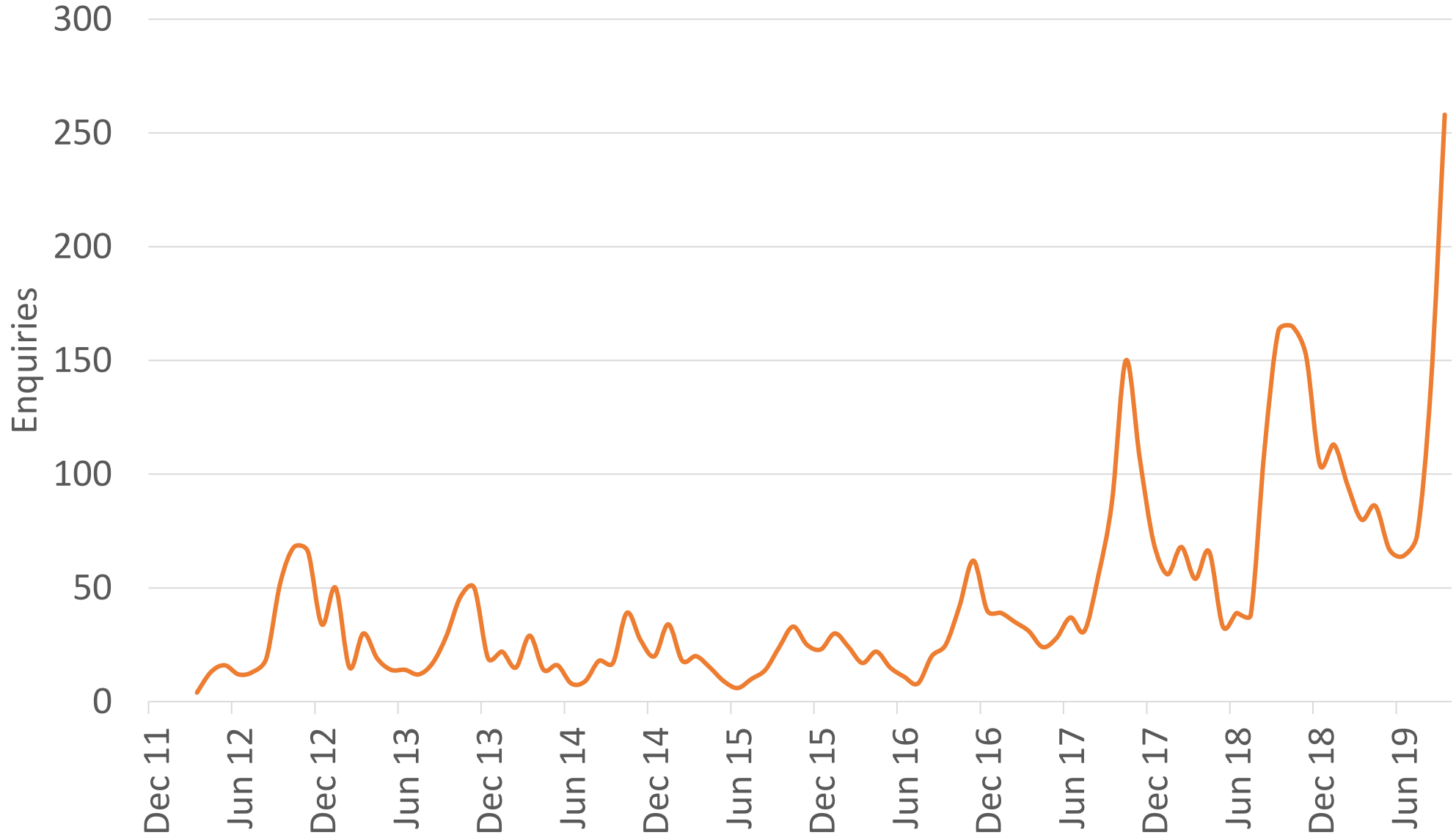
- 2017: 6 systems, 3 MW
- 2018: 45 systems, 30 MW
- 2019*: >55 systems, >300MW being commissioned

*to September 2019

SA Forecasts - rooftop PV and batteries

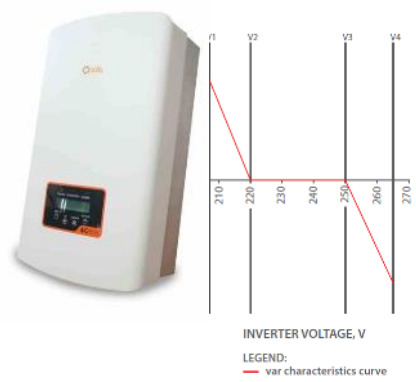


Customer enquiries – high voltage / PV related

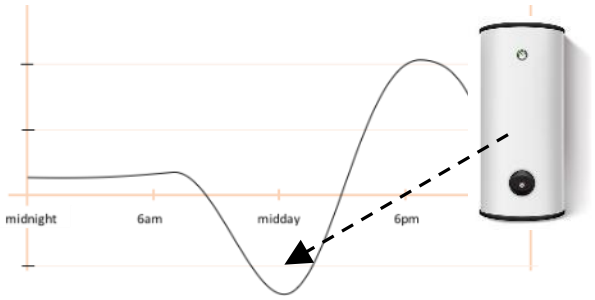


SAPN's response

- We remain highly supportive of customer's decision to install solar, batteries, etc.
- We are working on a range of measures to allow the grid to support more.



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 else can be done?

Inverter setting compliance!

What can the installer or manufacturer do?

- Ensure correct power quality modes and inverter settings are applied as per SAPN TS129
  (a requirement since November 2017)

What does this do?

- Volt-var regulates reactive power to manage voltage and offset the impact of solar generation.
- Volt-watt reduces real power output instead of tripping

Result?

- Significantly increases the amount of solar that can be exported to the network
- Better overall outcomes for customers

Increasing focus on compliance

- If we receive an enquiry regarding a voltage issue we will ask the customer to demonstrate the correct settings have been applied.
- Only inverters with volt-var and volt-watt are on our approved inverter listing.
- We’re integrating with the OTR eCoC to link installations and alterations with our internal registration and compliance systems.
- We are working towards improved performance management measures with the CEC.

Longer term strategies

- We’re working with DNSPs across Australia to develop common connection settings.
- We’re participating in the upcoming AS4777 review to standardise common settings.
- We’re working towards more flexible connection options for customers.

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