

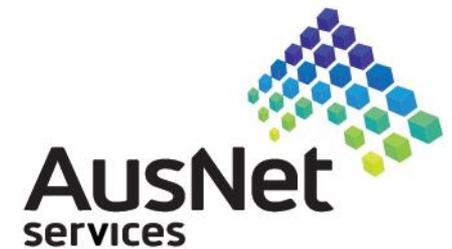
DER Integration in 2021-25

What are the options?

Week 5

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Purpose

- ▶ **Set out the options for enabling customers to utilise the network to export DER:**
 - › Under the current Rules
 - › Beyond the Rules
- ▶ **We are seeking agreement with the Customer Forum on the approach we take in the 2021-25 regulatory proposal in relation to these costs.**
 - › This topic is out-of-scope for the purposes of the New Reg model
- ▶ **The costs contained in this presentation are high level estimates that will be refined.**

SA Power Networks are also considering this issue in their reset. The AER has published the following paper from SAPN's Customer Challenge Panel:

<https://www.aer.gov.au/system/files/CCP%20subpanel%2014%20-%20Advice%20-%20Response%20to%20SAPN%27s%20approach%20to%20the%20challenges%20of%20the%20high%20penetration%20of%20embedded%20generation%20-%20June%202018.pdf>

Agenda

- ▶ Research highlights
- ▶ Challenge for 2021-25
- ▶ Options for the 2021-25 Proposal
- ▶ Economic Assessment of Investment
- ▶ Customer Communications
- ▶ Connection Charges
- ▶ Rules Limitations
- ▶ Interaction with Pricing
- ▶ Next Steps

Research highlights

Affordability

Control

**Interest in
new
technology**

BILL



~1/3 Customers thought their bills were poor or very poor in terms of **affordability**.

~2/3 Customers believe that their electricity provided poor **value for money**.

For many business customers (small and large) electricity prices are surpassing labour costs.

58% of non-solar customers are interested in installing solar

Interest in renewables is lower among businesses than residential customers, due to the high consumption and consequent long pay back periods.

Solar is viewed as beneficial, as is the idea of modernising the network to accommodate it.

~80% of solar customers would be **very unhappy** if their energy exports were restricted (time of day or amount of energy)

Despite understanding solar cross-subsidies, customers (incl. vulnerables) are prepared to pay for solar network upgrades.

Challenge for 2021-25

Need to reconcile the desires of customers to:

- Have agency over their solar exports (i.e. not be restricted); and
- Avoid further bill increases (despite the general comfort level with cross-subsidising solar customers expressed in the focus groups).

Under the current Rules, costs of upgrading the network to enable more export are borne either:

- **Entirely by the customer that causes an upgrade.** However, the ‘tipping point’ is not usually clear cut. This is effectively a hard limit for this customer, and all future customers, as the cost of the upgrade will be much higher than an individual is prepared to pay.
- **All customers.** For example, where a high capacity of installed solar PV results in voltage issues, all customers pay to rectify this.

The situation that applies is often a matter of luck, depending on location, order of DER connection applications received e.t.c.

Options for the 2021-25 Proposal

Today: focus on getting the most out of the existing network, e.g. through small manual changes. Will not be enough in 2021-25 (see slide 15).

1. **Limit**: Continue to constrain DER exports, unless the customer pays full costs of shared network upgrades.
2. **Smart Control**: Customers' DER export is maximised through real time management of the network within its physical limits. Establishing this platform is expected to cost \$8-10m in 2021-25.
3. **Upgrade**: Enable unconstrained export of DER. This is expected to cost \$20m next period, but costs are likely to rise substantially in future.
4. **Optimise**: Implement **Smart Control** and **upgrade** the network where economically optimal, balancing the costs of network upgrades with the wholesale market benefits to all customers of more electricity supply.

Options 1, 2 and 3 tested at the Focus Groups – broad support for 3, with some support for 2. On this basis, **Option 4** is worth exploring.

Economic Assessment of Investment

- Increasing DER export **benefits all customers** through **lower wholesale market prices** (and in some specific locations, lower future network costs).
- The value of this generation has been costed by the ESC to set feed in tariffs.

Period	Weekday	Weekend	Rate: c/kWh
Off-Peak	10pm- 7am	10pm- 7am	7.1
Shoulder	7am- 3pm, 9pm – 10pm	7am-10pm	10.3
Peak	3pm- 9pm	n/a	29.0

- A cost-benefit analysis can be done to estimate whether it would be economically efficient to upgrade parts of the network to enable more export.
- This would result in:
 - Some customers being limited, as the cost of upgrades is more than the benefits; and
 - Investment in parts of the network to enable more export.

Does the Customer Forum support this economic framework of looking at network upgrades for DER integration?

Customer Communications

Today we limit very few DER exports (see slide 16), but unless we upgrade the network to accommodate a very high level of export (driving up prices) we will need to limit more and more as the network reaches its hosting capacity.

All customers view DER export as a 'right' and 80% of solar customers would be very unhappy if their export was limited.

There is a mismatch between customer expectations and the limitations of the network.

This has been considered in our website re-design and is communicated on our website.

We would welcome the Forum's input into how to communicate these limitations to customers, beyond on our website, and manage/ set expectations before the customers invest in DER systems

Connection Charges – Potential Options

Under the ‘Optimise’ option the customer could choose to:

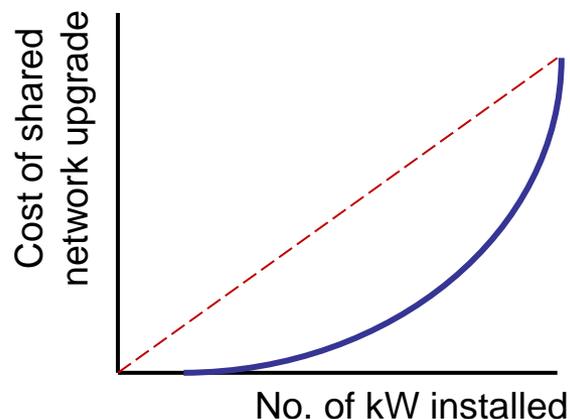
- Connect onto the Smart Control platform, at an initial upfront cost covering the ‘plug in’ costs (e.g. \$200 - 300), enabling the network to control and optimise export.
- Not connect to this platform, avoiding the upfront cost. If the customer is located in a constrained part of the network, more export will be constrained than if connected to the Smart Control platform. If in an unconstrained part of the network, will be able to export.

This would be subject to AER approval, but is possible under the current Rules.

We are also assessing whether our connection charges are cost reflective for different sizes of DER connection, and whether they can be simplified.

Connection Charges – Rules limitations

- The AER's Connection Guideline confirms that DER customers will not be charged an upfront contribution towards future required upgrades of the shared network (i.e. the customer will either pay for the entire cost of the upgrade or nothing).
- This is different treatment to load connections.
- But – we can restrict the exports of DER customers so we don't have to realise this cost (but customers can't export)
- If the arrangements were changed to be similar to load connections, we could estimate a connection charge using the expected cost of network upgrade per kW installed.



- This is potentially a more equitable 'user pays' approach than the current arrangements.

Interaction with Pricing

The current Rules prevent us from charging DER customers:

1. Any more than other customers with a similar load profile.

Under current energy-based pricing, solar customers often pay less despite having higher peak demands than non-solar customers. This cross-subsidy is expected to worsen over 2021-25.

Pricing reform (demand or capacity-based pricing) would address this redistribution.

2. An export charge for use of the network

Increases charges for DER customers exporting to the grid, so potentially more equitable.

But, at least in 2021-25, would not provide effective locational or temporal price signals.

In the future (beyond 2025) dynamic pricing of both load and export is possible.

Next Steps

- Does the Forum have an initial view on this topic?
- What questions should the Forum ask stakeholders during the upcoming engagement?
- What additional information does the Forum need from AusNet Services on this topic?

Questions – 1 of 2

- To what extent should AusNet Services accommodate distributed energy export?
- In what circumstances are restrictions on the time of day or amount of energy that can be exported to the grid acceptable (noting that this can reduce network costs)?
- Would you support options that incur limited cost such as:
 - restricting new customers to zero export from solar PV
 - imposing restrictions on all customers that limit exports at times (usually times of maximum solar generation)
 - restricting the size of new solar PV /renewable installations
 - allowing the network to control the solar PV/renewables at customer premises.
- Should AusNet Services augment the network to allow more solar PV/renewables to connect and export to the grid without restriction (or very limited restriction)? Is the amount of expenditure needed to achieve this outcome acceptable in terms of price impacts? Do the benefits to customers outweigh the costs?

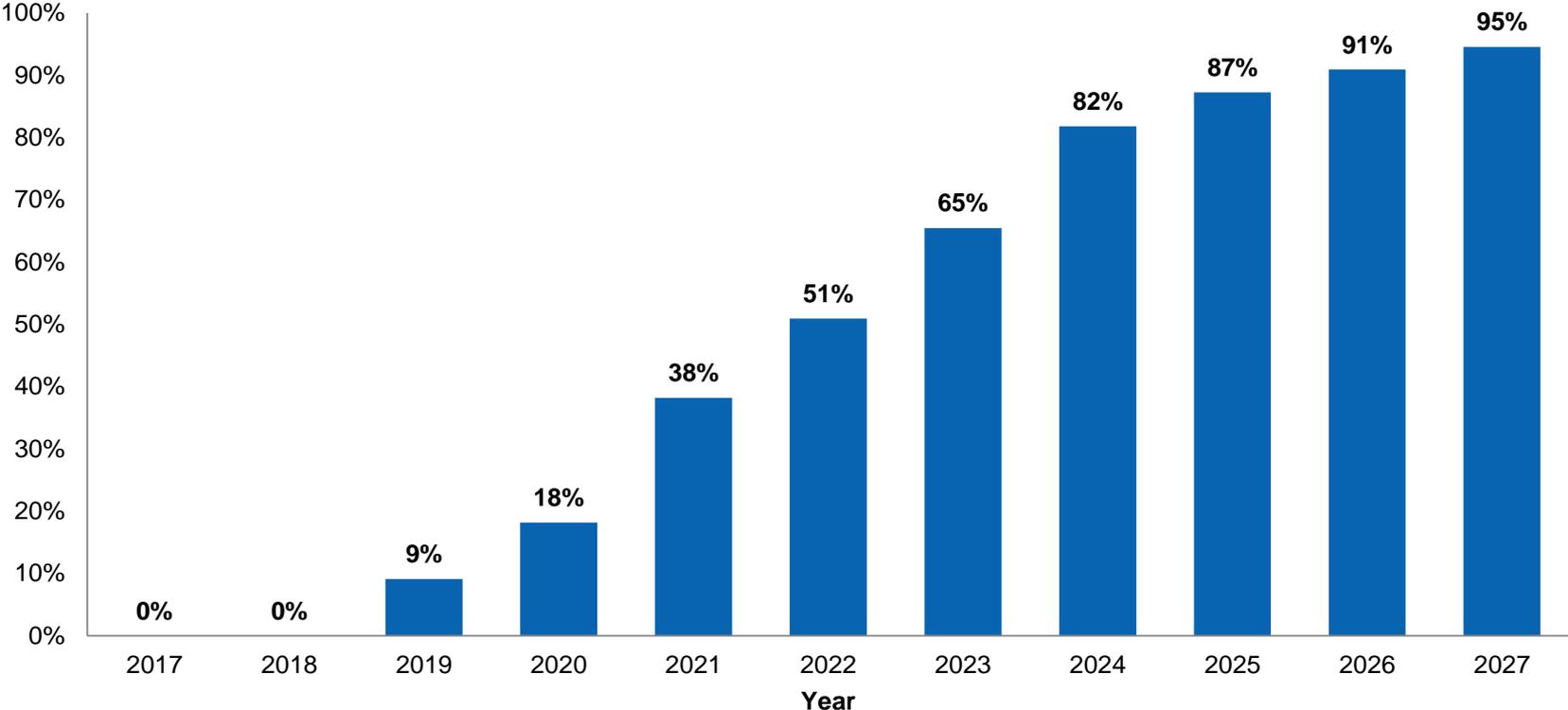
Questions – 2 of 2

- Should AusNet Services augment the network to allow more solar PV/renewables to connect and export to the grid without restriction (or very limited restriction)? Is the amount of expenditure needed to achieve this outcome acceptable in terms of price impacts? Do the benefits to customers outweigh the costs?
- If so, who should pay for upgrades to feed power into the grid:
 - new DER/solar connecting customers
 - all customers with DER/solar
 - all network customers
 - Government (taxpayers)
- Should small scale DER connections pay if they're using up 'headroom' (DER hosting capacity), but not causing any costs?
- Which option is more preferred for solar connection charges? Or should all options apply in different, well-defined circumstances?

Forecast trend: reverse power flows across our zone substations



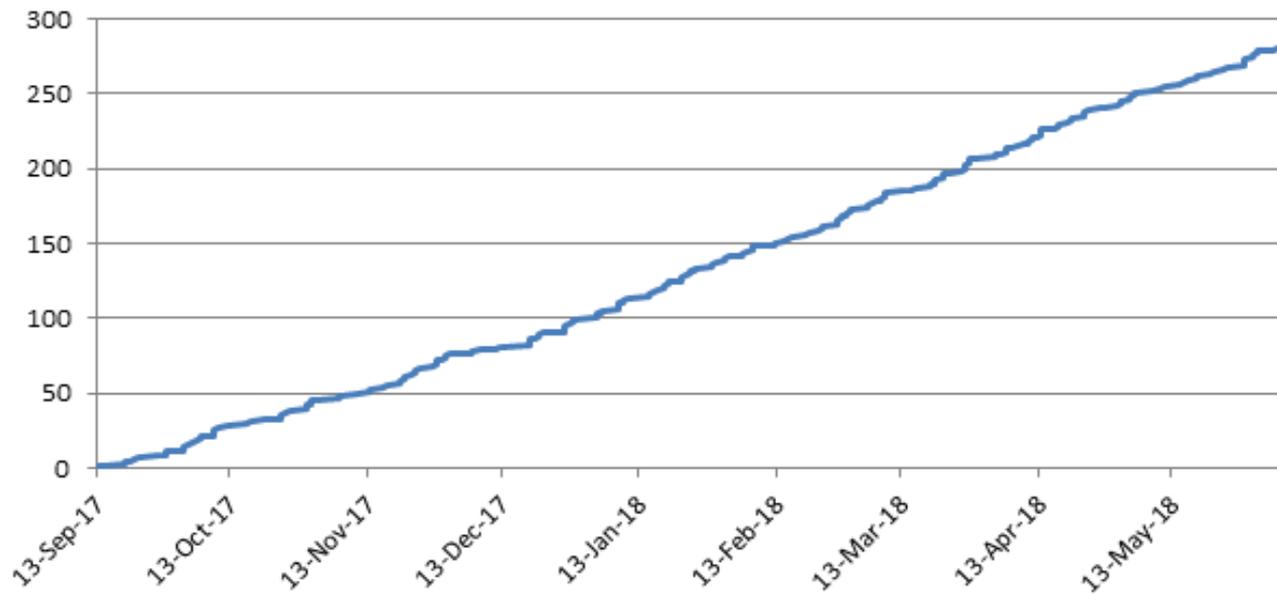
Percentage of our 52 Zone Substations with Reverse Power flow



Info Previously Requested – Number of Customers Limited by AusNet Services



Recorded number of export limited small generation systems



Under the 'Limit' scenario, the trend is expected to grow exponentially as feeders reach their hosting capacities.