AUSTRALIAN ENERGY REGULATOR

DER integration expenditure guidance note

Online forum
5 August 2021

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Housekeeping

- Questions may be raised at any time in the chat box.
- All questions raised today will be recorded, de-identified and considered as part of the consultation.
- Please remain on mute unless speaking.
- Use the 'raise hand' function to ask a question during the discussions.
- Note that views expressed by AER staff are not to be attributed to the AER.

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Agenda

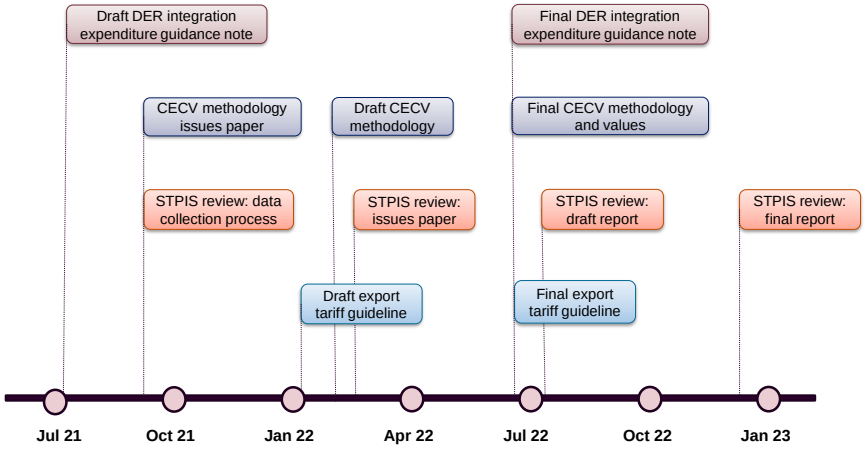
12.00 – 12.10	Introduction	Kris Funston, AER
12.10 – 12.25	AER strategic priorities & DER work program	Pat Devlin, AER
12.25 – 12.55	SA Power Networks' approach to hosting capacity and DER integration (including Q & A)	Bryn Williams, SA Power Networks
12.55 – 13.25	Customer perspective on DER integration expenditure (including Q & A)	David Prins
13.25 – 13.55	Q & A	All
13.55 – 14.00	Next steps	AER

AER strategic priorities

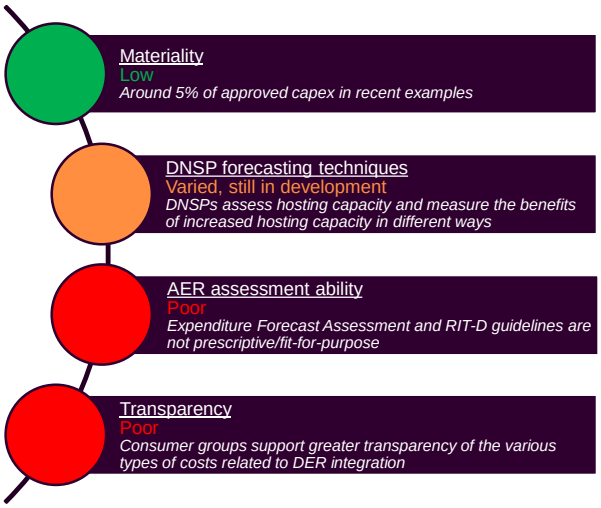
TILT

- **Incentivise proposals that reflect consumer preferences** and are **capable of acceptance**, including through:
  - establishing a Statement of Expectations for networks that aligns with the National Energy Objectives/National Gas Objectives
  - enhanced consumer engagement (e.g. NewReg).
- **Be more efficient in our regulation** by focusing on high-impact actions that matter most to consumers, including through:
  - building better assessment tools and supporting data
  - reviewing and refining incentive schemes and guidelines to ensure they remain relevant and fit for purpose
  - improving our approach to reviewing large transmission investments ($10 billion investment over 5–10 years).
- Make sure the **regulatory regime and our network performance reporting evolves to support the energy transition**:
  - distributed energy resources (DER)
  - stand alone power systems (SAPS)
  - depreciation profiles, focusing on intergeneration equity and stranding risks
  - ring fencing and waivers
  - bushfires, COVID-19 and other natural disasters.
- Undertake the **transparency review** for the Integrated System Plan.

DER work program



DER integration expenditure



Stakeholder feedback

DNSPs	Customers	Other
• How are you planning your networks for increases in DER? • What insights and practical experiences can you share?	• Are DNSPs demonstrating value in DER integration expenditure proposals? • How can proposals be more transparent?	• Are there new and/or innovative approaches to DER integration that we should consider?

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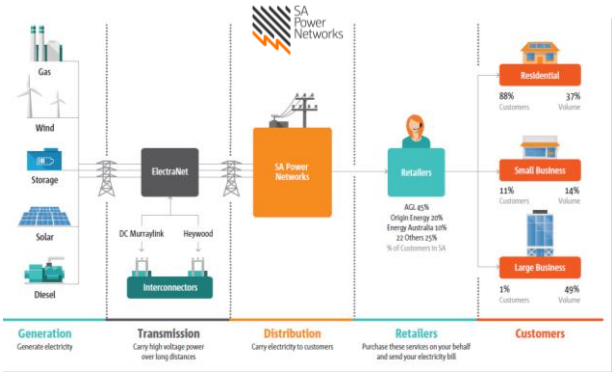
SA Power Networks' approach to hosting capacity and DER integration

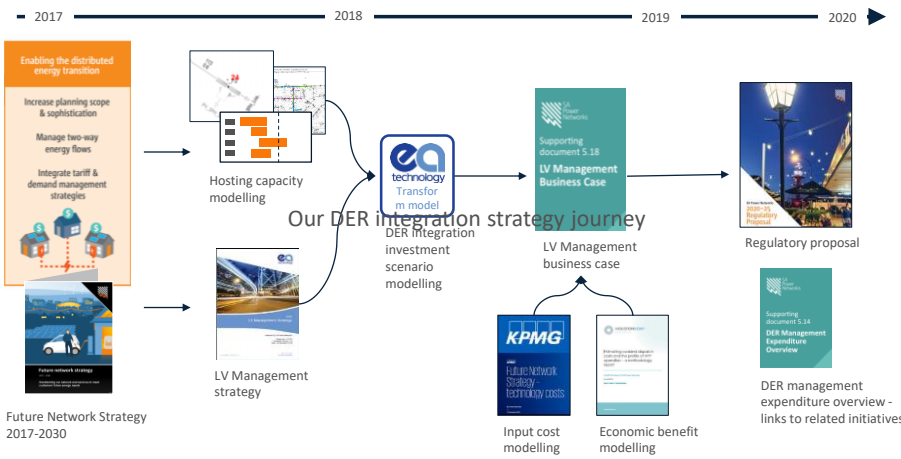
AER Public Forum on DER integration expenditure draft guidelines

5 August 2021

SA Power Networks

SA Power Networks

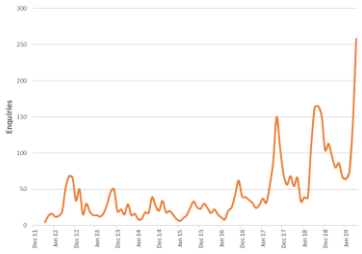




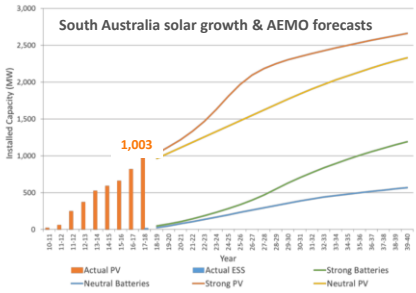
Our DER integration strategy journey

The identified need

- Manage impact of growth in DER on customer quality of supply
  - Do this efficiently
  - Choose the option that maximises customer benefits

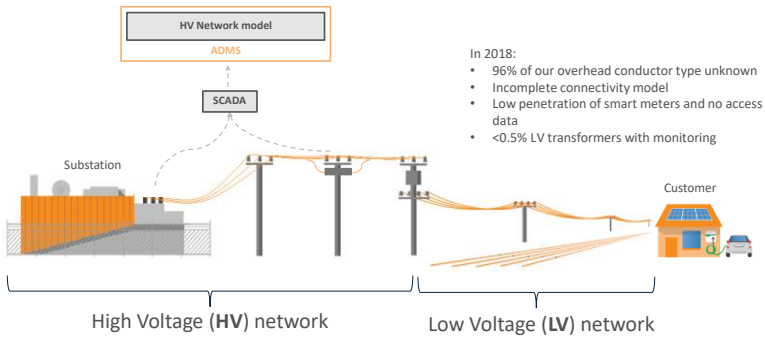


Customer high-voltage enquiries attributable to PV



Understanding hosting capacity

- We know that constraints arise initially in voltage management in our LV network
- Key challenge is that we have poor records of our LV network and almost no monitoring



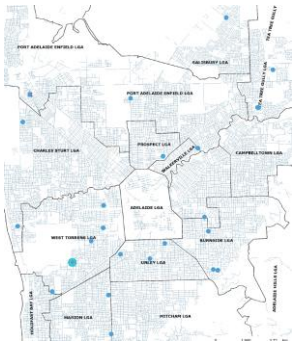
In 2018:
- 96% of our overhead conductor type unknown
- Incomplete connectivity model
- Low penetration of smart meters and no access to meter data
- <0.5% LV transformers with monitoring

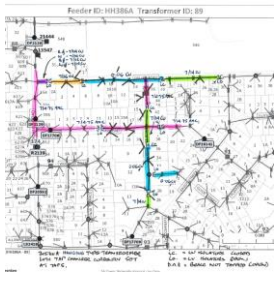
Step 1: classifying our LV networks

Category	Description	Total number of feeders
Modern Residential UG	UG residential LV area <= 100m of small (<0.1sqin) Cu cable	5419
Old Residential UG	UG residential LV area > 100m of small (<0.1sqin) Cu cable	312
Small Residential OH	OH residential LV area TF rating <= 100kVA	897
Medium Residential OH	OH residential LV area TF rating > 100kVA and < 315kVA	4083
Large Residential OH	OH residential LV area TF rating >= 315kVA	1230
Mixed Commercial/Residential OH	OH LV area 20-80% commercial and/or industrial demand	1874
Mixed Commercial/Residential UG	UG LV area 20-80% commercial and/or industrial demand	690
Majority Commercial	LV area with >80% commercial and/or industrial demand	3544
Single Customer Commercial	LV area with a single commercial or industrial customer	1695
CBD	LV area within the Adelaide Central regulatory region	551
Rural Township	Rural LV area with 5 or more customers	8793
2-4 Customer Rural	Rural LV area with 2-4 customers	13042
Single Customer Rural	Rural LV area with a single customer	14300
SWER Township	SWER LV area with 5 or more customers	509
SWER LV	SWER LV area with 4 or less customers	18590
Total		**75530**

Step 2: field scoping to gather accurate data for sample networks

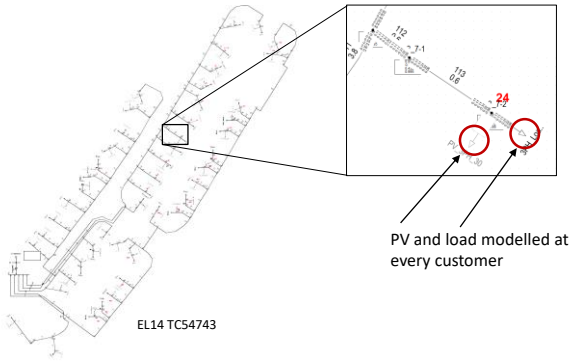
- Engaged contractor DPD to undertake conductor and open point scoping on 30 LV areas



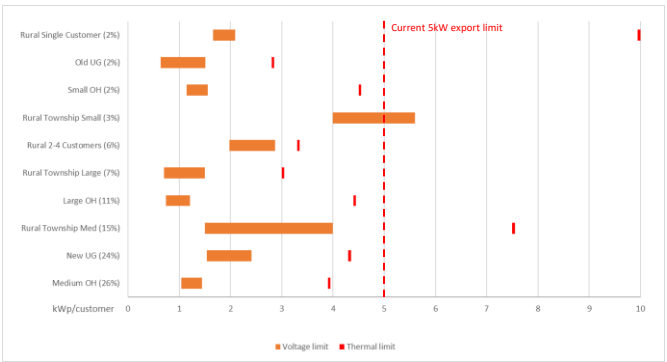


Step 3: PowerFactory modelling

- EA Technology engaged to undertake PowerFactory modelling
- Build detailed electrical models of sample networks across each LV network category
- Simulate increasing penetration of solar PV until voltage at customer connection point breaches 253V
- Continue simulation to identify point at which transformer thermal limits exceeded

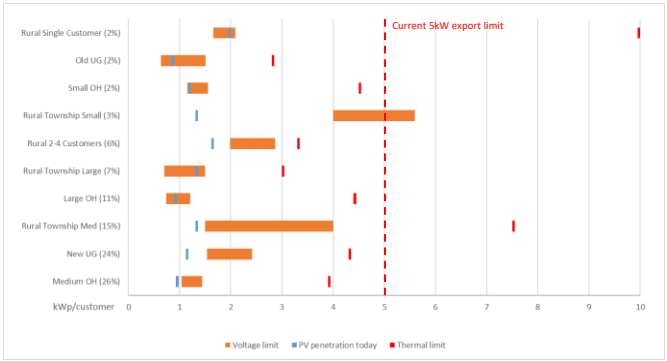


Hosting capacity analysis results - 2018



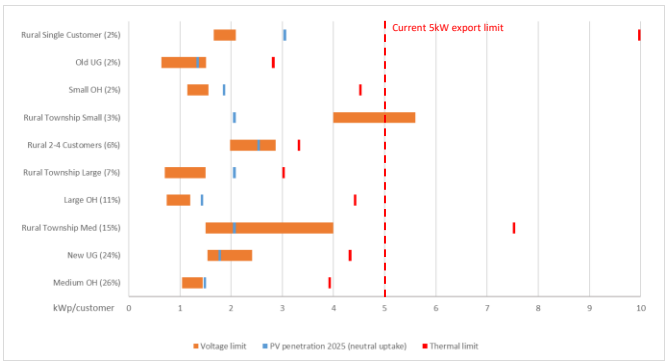
Hosting capacity analysis results - 2018

- Average PV penetration per network type in 2018

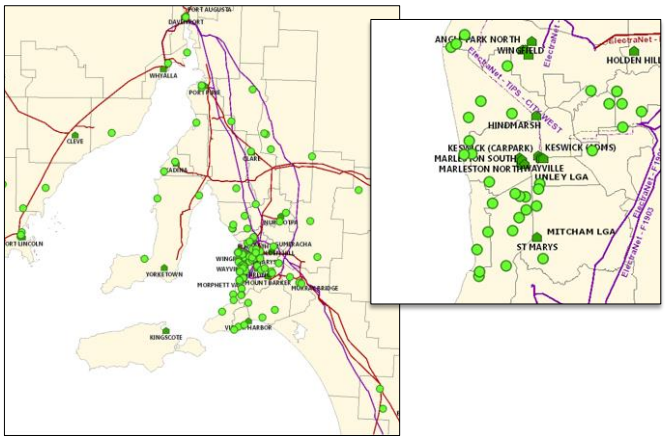


Hosting capacity analysis results - 2018

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



Cross check against PV related customer over-voltage enquiries



What can we do when we reach the technical limits of the local network?

1. **Cap DER at hosting capacity**
   *Once **local** hosting capacity reached, limit new systems to **zero or near-zero export***

2. **Invest in increasing network capacity**
   ***Upgrade the network** and/or **procure non-network solutions** to support growth in Distributed Energy Resources (DER)*

3. **Flexible export limits**
   *Build systems that enable **smart inverters** to receive **varying export limits** from SAPN, reflecting the real-time capacity of the network at their location*

Choosing the base case for our business case

- Our base case scenario was to **cap DER at hosting capacity**
- 'Do nothing', i.e. continuation of current practice in SA, was not a credible option
  - We cannot simply continue to approve new 5kW solar connections in congested areas knowing that they will cause local over-voltage issues for customers
  - We can't rely on AS4777 protection settings, i.e. over-voltage tripping and Volt/VAR and Volt/Watt self-curtailment
    - It is unacceptable to solar customers
    - It is not prudent, nor consistent with good industry practice
    - Quality-of-supply in the local area will continue to degrade, as over-voltage conditions result in cyclic tripping / reconnection behaviour
    - It impedes the development of high-value services like Virtual Power Plants
    - It results in inequitable service performance for customers

Modelling the strategies – The EA Technology Transform Model

- Techno-economic model developed with Ofgem and GB network operators to understand the level of investment required to meet Great Britain's targets for decarbonisation
- Model is used by all GB DNOs today to assist Ofgem in evaluating network investments to support growth in DER

"'World-leading' in its approach to this challenging area"

The Second Annual Report of the Ofgem and DECC Forum

"Enables smart and conventional distribution network solutions to be modelled side by side, and the best value options selected"

The Second Annual Report of the Ofgem and DECC Forum

"Ground-breaking smart grid evaluation model, Transform, completed to support the RIIO ED1 process"

Ofgem and DECC

ea technology

Modelling the strategies

Inputs

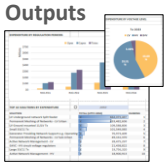
- Energy valuation (Houston Kemp)
- Hosting capacity results
- Network data (categories)
- Solution costs and benefits
- DER uptake forecasts
- Load and DER profiles
- Tariff impact model
- Sensitivities and strategies

Model

ea technology
Transform model

- Parametric model
- Statistically distributed

Outputs



- Networks in breach of limits
- Solutions employed
- Remediation spend profile
- Performance of different strategic options

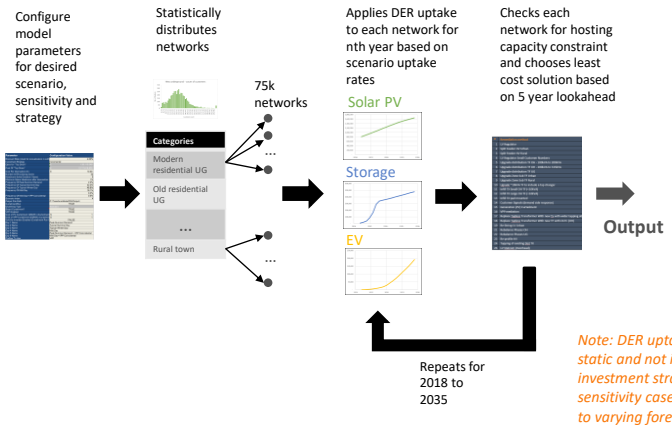
LV Management Business Case

Enabling technology cost model

Model input: solutions to increase network hosting capacity

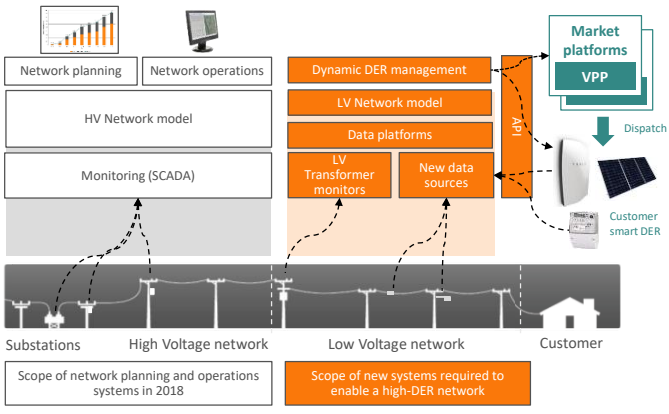
TF upgrades and infills	Non-network solutions
Upgrade distribution TF OH - 100kVA to 200kVA	Battery 100kW/200kWh -LV
Upgrade distribution TF OH - 200kVA to 315kVA	Battery 50kW/100kWh -LV
Upgrade distribution TF UG	Battery 25kW/50kWh -LV
Infill TX Small OH TF (<10kVA)	Battery 3MW/6MWh - HV
Infill TX Large OH TF (>10kVA)	Battery 1.5MW/3MWh -HV
Infill TX pad mounted	Customer inverter voltage support contract
Replace Tapless Transformer with tap changer (OH)	
Replace Tapless Transformer With new TF with OLTC (OH)	**Feeder reconfiguration**
Ugrade ~10kVA TF to include a tap changer	Split Feeder HV Urban
	Split Feeder HV Rural
Rebalancing and retapping	Re-String LV Urban
Load Transfers (LV)	Re-String LV Rural
Tapping of existing Dist TX	Re-String HV OH Urban
Further Tapping of existing Dist TX	Re-String HV OH Rural Short
Rebalance Phases OH	Re-String HV OH Rural Long
Rebalance Phases UG	Split Feeder HV UG
	Split Feeder HV OH Rural Long
Reactive power support (network)	Split Feeder LV UG
LV Regulator	Split Feeder LV OH Urban
LV Regulator Small Customer Numbers	Split Feeder LV OH Rural
HV Reactor Bank	
HV Regulator	**Substation upgrade**
Existing Regulator+LDC	Upgrade Zone Sub TF Urban
LV Statcom (Underground)	Upgrade Zone Sub TF Rural

Model process – estimating future augex costs



Note: DER uptake forecasts are static and not influenced by investment strategy. We run sensitivity cases to test robustness to varying forecasts.

Investment required to enable dynamic export limits



Modelling benefits: economic value from enabling more DER exports

Inputs

- AEMO price setter data
- ISP fuel prices forecasts and generator technical parameters
- Generation mix forecast and sensitivities

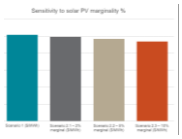
Model

HOUSTONKEMP Economists

Avoided dispatch model

- Identification of marginal plant
- Consideration of changing generation mix over time
- Calculate marginal cost of generation

Outputs



- Avoided dispatch cost profiles
- Feeds into Transform model

Cost/benefit analysis

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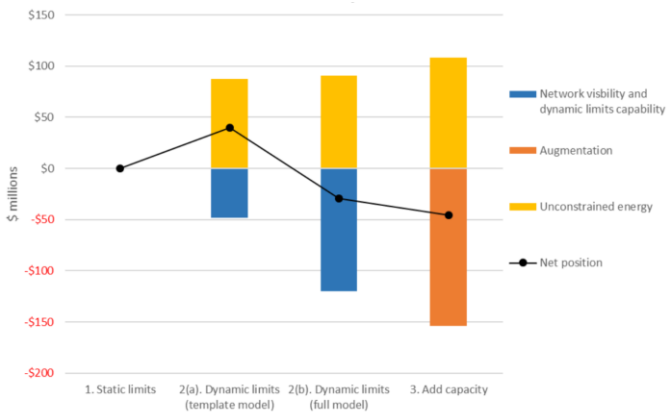
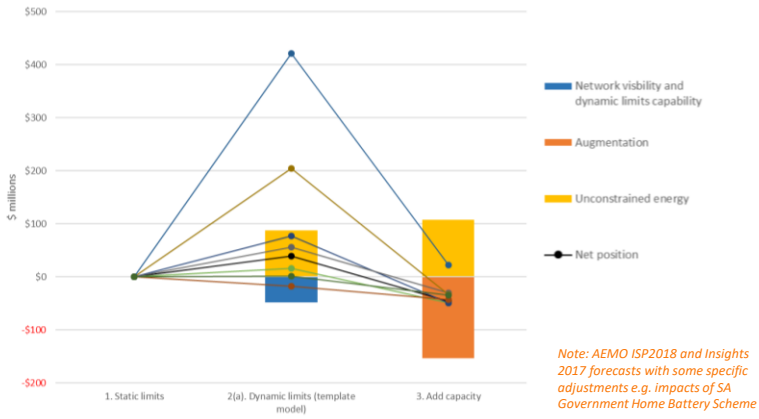
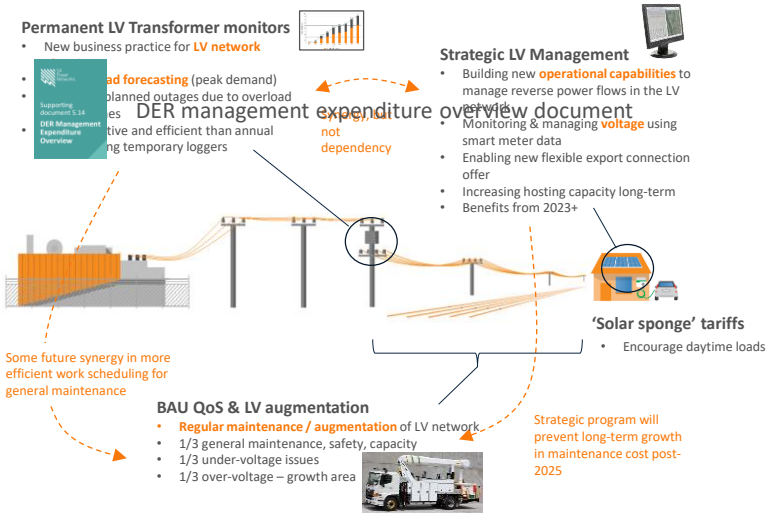


Sensitivity analysis

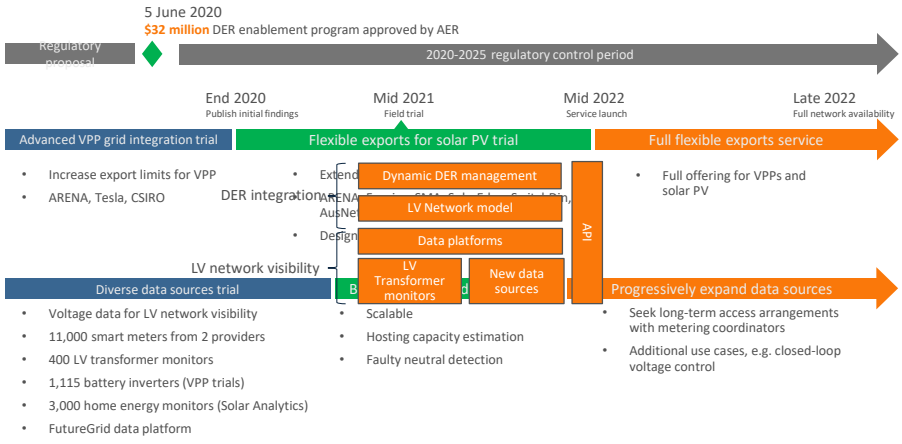


Note: AEMO ISP2018 and Insights 2017 forecasts with some specific adjustments e.g. impacts of SA Government Home Battery Scheme

DER management expenditure overview document



We are progressing from trials to production



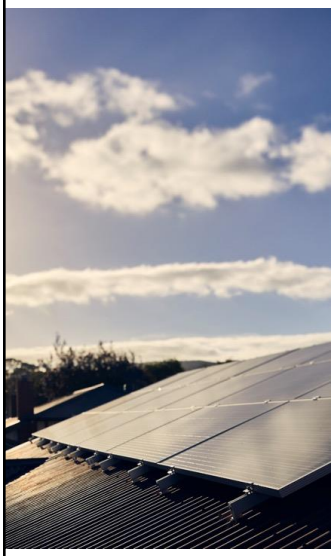
Key messages & lessons learned

DER integration strategy document

- We support this. It is important for customers and stakeholders to understand:
  - how a DNSP's proposed DER integration expenditure and activities fit within its long-term strategy for enabling DER
  - the combination of approaches (network, non-network, pricing, technical standards etc) that the DNSP is pursuing to efficiently enable DER
- Dynamic export limits provide an elegant means to manage service performance up to the point at which augmentation is warranted

Identified need

- Appropriate to not be prescriptive in this regard; as things evolve we may need to consider new issues.
- In 2019 our 'identified need' was to manage impact of growth in DER on performance of the **consumption service**
- In future (post *Access & Pricing* rule change) we expect:
  - Identified need likely to be more directly linked to the performance of the **export service** and **what customers want and value**
  - It will be possible to allocate costs
  - There will be defined service levels and incentives



Key messages & lessons learned

Base case

- Reliance on AS4777 protections and inverter tripping is not a credible base case

Understanding hosting capacity

- Agree with the AER not taking a prescriptive approach to how hosting capacity should be assessed
  - DNSPs differ in their current capabilities and understanding
  - A principles-based approach is reasonable
  - SA Power Networks is pursuing a 'diverse data sources' strategy
- Long-term, efficient access to data from smart meters is a fundamental issue for DNSPs outside of Victoria
  - AEMC's review of the contestable metering framework is seeking to address issues with the current rules
  - Procurement of data may require several step changes in opex in successive regulatory periods as need and opportunity increase over time

Key messages & lessons learned

Valuing costs and benefits of options

- Wholesale market and network benefits (i.e. shared benefits) should be considered.
- But the Guidance Note should also consider **benefits to customers** and recognise the role of engagement in determining the level of network spend customers support:
  - With the *Access and Pricing* reforms, DER customers may bear the cost of DER integration expenditure, so it's important we understand how they value the service
  - In our 2019 regulatory proposal, costs were borne by all customers, making it more important to identify shared benefits
  - The AEMC *Access and Pricing* Draft Decision outlined a broader application for the 'Customer Export Curtailment Value' (CECV) than appears intended by the Guidance Note – i.e. it would serve a similar function to the VCR by being an input to cost / benefit business cases and a STPIS for exports
  - Service levels and export STPIS parameters will also need to be considered
- The Guidance Note's proposal for DNSPs to consider the costs borne by customers in investing in DER, but not the benefits of those investments, may drive imbalanced assessments
- **These issues should be further examined, with greater emphasis on establishing what customers actually want and value from the service.**

SA Power Networks

Empowering South Australia

Distributed Energy Resources (DER) Expenditure Guideline

Consumer Challenge Panel

Presentation to Public Forum
5 August 2021

A consumer focused view

CCP sub-group
Presented by David Prins
Presentation by David Prins
With input from Mark Henley and Mike Swanston

DER Expenditure Guideline

The context (from a consumer viewpoint) (1)

- DER includes rooftop solar, batteries, electric vehicles and energy management systems
- DER is increasingly an issue for various parties
- Many consumers have already invested in DER, and more will do so in future, for a variety of reasons, including saving the planet, looking to the future, taking control of their energy footprint, saving or making money
- Consumers are showing a passion for wanting to play an active part in Australia's energy transition for the benefit of all Australians, and indeed all mankind
- Not all the factors that influence consumer decisions are directly captured in the National Electricity Objective (NEO)

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DER Expenditure Guideline

The context (from a consumer viewpoint) (2)

- On the other hand, not every consumer who has wanted to has the funds or indeed property that they own where they can install DER
- Many have portrayed the consumers who have invested as people trying to make money at the expense of other consumers
- Sometimes those who invest in DER are portrayed as the "bad guys" whose "selfish" actions have caused the electricity system to be less easily manageable and who are ultimately creating extra costs for everyone
- Talk of DER being curtailed, and of customers being required to pay to export DER also adds confusion to consumers with DER or planning to invest in DER

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DER Expenditure Guideline

The context of the DER Expenditure Guideline

- The context is the regulatory determination processes that the AER undertakes periodically
- Each business' determination process sits alone – but consistency is important to businesses, investors and consumers, and the AER needs to be even-handed in regulatory determinations
- Each business has different circumstances – geography, customer numbers and density, consumer and system opportunities for DER, etc.
- Victoria for example has full rollout of smart meters
- Consideration of the value of DER has many facets

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DER Expenditure Guideline

Other contextual issues that are important to consumers

- While the AER work is largely focused at the DNSP space, we cannot ignore that the growth in rooftop solar and utility renewable generation is driving new costs into consumers' bills other that just DUoS.
  - Costs that might be considered to be emerging as a result of the growth of non-dispatchable, low-inertia generation could include ISP, Victorian regional transmission upgrades, big batteries, new FCAS, 5-minute dispatch, synchronous condensers, peaking plant, Marinus LInk, less-than optimal PPAs (see ACT), risk of less than optimal PPAs (NSW REZ PPA underwriting), etc.
- While forecasting out further is useful, the ongoing variation of government subsidies and policies can change the situation rapidly.
- The challenge of *minimum demand* is influencing consumer attitudes, as we consider mandatory control systems for consumer equipment.

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DER Expenditure Guideline

Other contextual issues that are important to consumers

- We need to consider DER in the greater space of active demand response, where demand-responsive devices such as water heating, pool pumps and air conditioning are considered as complementary devices to export incentives, and any regulatory approach should work seamlessly for demand response as it should for embedded generation / feed-in.
- Maximising self-consumption of rooftop energy will remain a key objective for consumers. This is leading to the demise of controlled load energy. As consumers move to self-consume, they take appliances off controlled load to run through the day. That reduces the flexibility of DNSPs to manage peak demand. New regulations and tariff policy need to fit that trend.
- Accommodating feed-in has overshadowed the other parts of DER. We need to be just as innovative – and regulations should encourage – the whole demand response picture.

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DER Expenditure Guideline

Other contextual issues that are important to consumers

- Many of the answers lie on the customer's side of the meter – how does that fit?
  - Costs to consumers to optimise self-consumption – changing usage habits, new apps, more elegant appliances.
  - There are direct costs to consumers to install capability to take advantage of any regulatory incentives. It is not all upside.
  - Who champions these initiatives? DNSPs? Retailers? Aggregators? Where's the payback for them?
- Networks should be incentivised to set up frameworks for the future on a 'no regrets' basis – smarter inverters, basic comms, enhanced demand response capability.

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DER Expenditure Guideline

Other contextual issues that are important to consumers

- We must consider the significant advantages of non-network approaches. But in today's market, who will promote such an approach? Will it be DNSPs, who make their money from return on investment in assets?
- We have to address the issue of optimal voltage management before we got too deep into complicated regulatory frameworks. It is not hard, relatively cheap and should precede lots of capex in network augmentation or ICT capability.
- Network asset utilisation should be a focus – utilisation factors are falling, so the consumers' return on assets is declining too. Anything we do should work towards maximising the utilisation of the billions of dollars of network assets we have in place already.

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DER Expenditure Guideline

DER proposals, as with Regulatory proposals, should include consumer engagement as early as possible in the process

The table on the next slide shows how the AER is looking at assessing consumer engagement for regulatory proposals.

It can be a basis for a similar table that looks at assessing consumer engagement in DER

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Table 7 Framework for considering consumer engagement

Element	Examples of how this could be assessed
Nature of engagement	• Consumers partner in forming the proposal rather than asked for feedback on distributor's proposal • Relevant skills and experience of the consumers, representatives, and advocates • Consumers provided with impartial support to engage with energy sector issues • Sincerity of engagement with consumers • Independence of consumers and their funding • Multiple channels used to engage with a range of consumers across a distributor's consumer base
Breadth and depth	• Clear identification of topics for engagement and how these will feed into the regulatory proposal • Consumers consulted on broad range of topics • Consumers able to influence topics for engagement • Consumers encouraged to test the assumptions and strategies underpinning the proposal • Consumers were able to access and resource independent research and engagement
Clearly evidenced impact	• Proposal clearly tied to expressed views of consumers • High level of business engagement, e.g. consumers given access to the distributor's CEO and/or board • Distributors responding to consumer views rather than just recording them • Impact of engagement can be clearly identified • Submissions on proposal show consumers feel the impact is consistent with their expectations
Proof point	• Reasonable opex and capex allowances proposed ◦ In line with, or lower than, historical expenditure ◦ In line with, or lower than, our top down analysis of appropriate expenditure ◦ If not in line with top down, can be explained through bottom up category analysis

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DER Expenditure Guideline

Work by the AER to date in which there has been consumer input

- Consultation paper 'Assessing DER integration expenditure'
- Work on the Value of Distributed Energy Resources (CSIRO and CutlerMerz)
- While not solving all the issues associated with DER, the AER's DER integration expenditure guideline will be a key instrument towards ensuring that DER investment, and industry investment and behaviour in response to and facilitating DER investment, is in the long term interests of consumers

-> Consumers should benefit from this work of the AER

- The AEMC has also issued a draft determination for electricity and retail rules to integrate DER more efficiently into the grid
- The AEMC's final report is now due to be published on 12 August 2021

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DER Expenditure Guideline

Work by the AER to date in which there has been consumer input

- Consultation paper 'Assessing DER integration expenditure'
- Work on the Value of Distributed Energy Resources (CSIRO and CutlerMerz)
- While not solving all the issues associated with DER, the AER's DER integration expenditure guideline will be a key instrument towards ensuring that DER investment, and industry investment and behaviour in response to and facilitating DER investment, is in the long term interests of consumers

-> Consumers should benefit from this work of the AER

-> Key question is **how the process benefits consumers**

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DER Expenditure Guideline

Overall comment regarding consumers in addressing the draft Guideline

- The NEO is all about the long term interests of **consumers** of electricity.
- DER relates to investments made by **consumers**.
- DER can provide **customers** with a range of benefits:
  - **consumers** who install DER units may be able to reduce the price they pay for electricity or obtain improved reliability outcomes
  - DER may also help reduce the cost of power system augmentation, helping to reduce the overall cost of supply faced by **consumers**
  - increased penetration of DER may also help reduce the overall emissions intensity of the NEM, by displacing other more emissions-intensive generation
  - **consumers** who install DER may benefit from a sense of empowerment, autonomy and resilience, and may be willing to pay a premium to invest in DER or accept reduced revenue from their DER investment.
- But does the draft Guideline really measure benefits from the point of view of consumers?

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DER Expenditure Guideline

Overall comment regarding consumers in addressing the draft Guideline

- Is the Guideline, and what will follow from the Guideline, explainable to a consumer wanting to
  - Make informed decisions regarding what investments to make and how to operate those investments
  - Understand how they can contribute to societal good
  - Understand why what they initially might want to do is not the "best" solution
- Extrapolate from "what expenditure should the AER approve" to "what effect will this have on industry decision-making and hence on consumers' decision-making"

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DER Expenditure Guideline

Innovation

- The draft Guideline talks about specific, known, discrete DER proposals
- There needs to be some capacity to try things, preferably as part of collaborative processes / projects. Perhaps a DER sandbox option?
- Both shorter term and longer term considerations are needed
- Assessment will likely be different for
  - Shorter term known projects vs.
  - Longer term potentially high benefit but more innovative / new tech application projects

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DER Expenditure Guideline

Question 1: Do you agree with the proposed guidance relating to how DNSPs should prepare a DER integration strategy?

- Customer advocates suggested that DNSPs should present a coherent and coordinated approach to DER integration across their expenditure plans, tariff strategy and demand management strategy in regulatory proposals
- Customer advocates were also critical of the way in which DER integration projects have been presented, making it difficult to compare DER integration expenditure
- Customer advocates were particularly concerned about the way in which ICT investment proposals have been presented, making it difficult to determine what share of the investments can be attributed to DER

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DER Expenditure Guideline

Question 1: Do you agree with the proposed guidance relating to how DNSPs should prepare a DER integration strategy?

- Customer advocates also commented that, where network benefits from DER integration are identified, they should expect to see a commensurate level reduction in expenditure within other parts of the DNSPs' capital expenditure programs and that this is not often transparent
- The narrative in which DER sits is important

The AER's preliminary view addresses consumer advocate concerns

- Requests that DNSPs present a coherent DER integration strategy that is transparent in all aspects
- Proposals for DER integration expenditure should align with a broader and longer term DER integration strategy

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DER Expenditure Guideline

Question 2: Should the format of the business case be prescriptive? If so, how?

The AER's preliminary view

- We do not propose to prescribe a particular template or format for the DER integration expenditure business case, as we encourage DNSPs to submit proposals that are innovative and best reflect their customers' expectations
- However, we consider that as a minimum, the abovementioned aspects of the proposal should be clearly articulated and detailed in order for the proposed expenditure to be assessed

We see no consumer-side need for the format to be prescriptive, and a non-prescriptive approach by the AER is often preferable.

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DER Expenditure Guideline

Question 3: Are there particular input assumptions that should be consistent for all DNSPs?

- Input assumptions are not a standalone feature of a DNSP's DER integration business case, however are critical to defining the base case scenario and quantifying DER benefits
- As with other types of network expenditure, it is important that DNSPs select credible input assumptions in their proposals for DER integration expenditure
- CSIRO/CutlerMerz also recommended that the AER consider commissioning, on an annual basis, the development of standard assumptions (including via electricity market modelling), which may be used as inputs to DER integration cost-benefit assessments

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DER Expenditure Guideline

Question 3: Are there particular input assumptions that should be consistent for all DNSPs?

The AER's preliminary view

- We have so far not considered commissioning the development of standard input assumptions
- However, as we discuss in section 6, we will consult separately on the CECV methodology and consider the input assumptions that may be required under this methodology. This may or may not require the commissioning of standard input assumptions

Input assumptions need to include system wide assumptions (eg ISP, Commonwealth policy) and also network specific consideratons (eg low customer density, higher DER)

We see some merit in the AER commissioning the development of standard input assumptions, as against having each business commission a consultant to provide competing input assumptions

On the other hand, this may be talking the AER into a too detailed area

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DER Expenditure Guideline

Question 4: In what ways could DNSPs justify their assumed export limit in the base case scenario?

Question 5: Are there particular examples where DER adoption forecasts may vary between the base case scenario and the investment case?

The AER's preliminary view

- "Networks should invest to integrate DER based on reasonable assumptions of DER adoption and not in a way that is actively incentivising additional DER adoption"
- We agree with CSIRO/CutlerMerz's comments on the use of static export limits
- Although DNSPs may assume a static export limit in their base case scenario, they should demonstrate that this limit is not arbitrary
- DNSPs could undertake sensitivity analysis to demonstrate that the investment case is preferable when compared to a range of business as usual export limits
- This may demonstrate that the assumed export limit is not selected arbitrarily

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DER Expenditure Guideline

Question 4: In what ways could DNSPs justify their assumed export limit in the base case scenario?

Question 5: Are there particular examples where DER adoption forecasts may vary between the base case scenario and the investment case?

A direct response to question 4 could include AEMO forecasts, jurisdictional policies, consumer input, recent past performance

Beyond that, what seems to be missing here is an assessment from a consumer viewpoint

Consumers are not all the same. They have different views and motivations

If networks to make "reasonable assumptions of DER adoption", they must be based on consumer engagement across the range of consumers and consumer groups

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DER Expenditure Guideline

Question 6: Do you agree with the proposed criteria for undertaking hosting capacity assessments?

Question 7: Are there other examples of approaches that DNSPs could adopt to assess network hosting capacity?

The proposed criteria are a helpful start and will need to evolve with further application

Networks should make best use of data and information pertaining to their network

Data and information that pertains to expected consumer behaviour should be based on consumer engagement

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DER Expenditure Guideline

Question 8: Do you agree that the total electricity system is the appropriate system boundary for considering DER costs and benefits?

The options provided by CSIRO/CutlerMerz were

1. To the meter: At the boundary of the electricity system (representing costs that all electricity consumers pay) but excluding any behind the meter assets;
2. Total electricity system: Extending the boundary to behind the meter, where DER assets are included; or
3. Society: All benefits to society are considered.

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DER Expenditure Guideline

Question 8: Do you agree that the total electricity system is the appropriate system boundary for considering DER costs and benefits?

Key differences:

Cost/benefit category	To the meter	Total electricity system
Environmental benefits	Included if they impose a direct cost or confer a financial benefit on non-DER resources	Included if they impose a direct cost or confer a financial benefit on all resources
Change in DER investment	Excluded	Included

This leads us to prefer “total electricity system” over “to the meter”

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DER Expenditure Guideline

Question 8: Do you agree that the total electricity system is the appropriate system boundary for considering DER costs and benefits?

Key differences:

Cost/benefit category	Total electricity system	Society
Environmental benefits	Included if they impose a direct cost or confer a financial benefit on all resources	Included even if no government imposed costs or benefits
Intangible benefits	Excluded	Included

Consumers experience society benefits (and costs) but we understand that the scope of the NEO may not extend to external society benefits and costs.

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DER Expenditure Guideline

Question 9: Do you agree that the methodology used to quantify wholesale market benefits should balance shorthand and longhand approaches?

The AER states:

DER integration can deliver the following wholesale market benefits:

- Avoided marginal generator short-run marginal costs (SRMC) – Increased DER generation substitutes for generation by marginal centralised generators, which may have higher SRMC, in the form of fuel and maintenance costs.
- Avoided generation capacity investment – Increased DER generation reduces the need for investment in new/replacement centralised generators.
- Essential System Services (including FCAS) – Increased DER capacity enables more DER participation in ESS markets, reducing investment in new/replacement centralised ESS suppliers.

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DER Expenditure Guideline

Question 9: Do you agree that the methodology used to quantify wholesale market benefits should balance shorthand and longhand approaches?

Consumer response:

Yes, but:

- How do LRMC and SRMC feed into actual wholesale or retail prices?
- Consumers pay prices c/kWh, $/kW, $/day, etc., not marginal costs
- Marginal cost models are opaque, sensitive to inputs, can provide widely differing results, are not open to consumer analysis
- Consumers are likely to see transparency in modelling approaches, be they shorthand or longhand

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DER Expenditure Guideline

Question 9: Do you agree that the methodology used to quantify wholesale market benefits should balance shorthand and longhand approaches?

We agree with the AER that

- It is highly unlikely that the cost of undertaking electricity market modelling would materially erode the benefits associated with any proposed DER integration proposal
- There is a reasonable risk that shorthand methods may be too simplistic
- The AER should aim to strike an appropriate balance between simple but potentially inaccurate methods and accurate but overly complex (and potentially expensive) methods

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DER Expenditure Guideline

Customer Export Curtailment Value (CECV)

- The AEMC's recent draft determination will require the AER to develop and consult on a Customer Export Curtailment Value (CECV) methodology and publish CECVs annually.
- These values will be different from values of customer reliability, as they are not intended to measure the value to customers of having a more reliable export service or consumption service but rather the detriment to customers and the market from the curtailment of exports.
- The AER needs to consider the CECV carefully. How prescriptive will it be?

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DER Expenditure Guideline

Customer Export Curtailment Value (CECV)

The AER's current view

- The CECV methodology will provide the method for calculating wholesale market benefits
- Given the importance of ensuring consistent approaches across the VaDER and CECV methodologies, we are unable to provide guidance on how these values should be calculated until we develop the CECV methodology for consultation
- We note that if the rule change is finalised, we will be required to consult on and develop the CECV methodology under the Rules consultation procedures and calculate and publish initial CECV estimates by 1 July 2022

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DER Expenditure Guideline

Questions 10 and 11 relate to market models

Comments above apply in regard to appropriateness and transparency

DER Expenditure Guideline

Question 12: Do you agree with the proposed principles for quantifying wholesale market benefits? Are there other principles that we should consider?

The following comments relate to **all** benefits to consumers, not just wholesale market benefits.

Benefits can accrue to individual household and small business customers (and C&I) at individual level and also can be shared at a community level, e.g. community batteries, or at a housing development or embedded network level.

There may also be distributional benefits. For example, a DER proposal may be able to assist vulnerable customers or lower income communities, who don't have ready access to DER benefits from home ownership, such as renters. Similarly, distributional benefits may apply to rural / remote communities at edge of grid.

DER Expenditure Guideline

Question 12: Do you agree with the proposed principles for quantifying wholesale market benefits? Are there other principles that we should consider?

Businesses should therefore consider the direct benefits to customers and the customer groupings, from a customer perspective. Segmentation might include benefits accruing to:

- Individual households
- Individual SMEs
- Benefits at a local community level

Other benefits outside the standard framework may include

- Economic / regional development potential enhanced, including jobs
- Support for coal dependent communities in transition away from fossil fuel based industry and jobs
- Etc.

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DER Expenditure Guideline

Question 13: Do you agree with the proposed methods for quantifying network benefits?

CSIRO/CutlerMerz noted that, for network benefits of additional DER, there is generally only one way to calculate network benefits which is the normal network planning processes as described in the RIT-T and RIT-D guidelines

However, there may be some circumstances where a network might use an average avoided cost rather than a specific avoided project cost and this could be considered a shorthand approach

Its recommended approach for selecting network methods is based on the type of network benefit and whether it derives from a specific network project affecting specific assets or a broad-based project with wider and longer lasting impacts

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DER Expenditure Guideline

Question 13: Do you agree with the proposed methods for quantifying network benefits?

Our initial view from a consumer perspective is to support this approach

We also note that it will likely be easier to identify / measure after the fact what generation was enabled or expenditure was avoided, and hence how effective the DER investment was, as against a LRMC based method

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DER Expenditure Guideline

Question 14: Do you agree with the proposed methods for quantifying environmental benefits?

- In line with CSIRO/CutlerMerz's recommendation, these benefits may only be quantified if there is an identifiable tax, levy or other payment associated with environmental or health costs which producers are required to pay or where jurisdictional legislation directs DNSPs to consider the impact of these externalities and has provided a value that is to be used
- Under the total electricity approach to system boundaries, these benefits may be included if they impose a direct cost or confer a financial benefit on all resources (including both DER and non-DER)
- Where there is a jurisdictional requirement to do so, renewable energy targets and/or a potential carbon price for generators should be incorporated into the DNSP's calculation of wholesale market benefits

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DER Expenditure Guideline

Question 14: Do you agree with the proposed methods for quantifying environmental benefits?

The consumer perspective is not consistent with this.

Consumers care about environment and health and amenity whether or not there is an associated identifiable tax, levy or other payment

And they increasingly care about these factors

But we understand the limitations of the NEO

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DER Expenditure Guideline

Intangible benefits

From the draft explanatory statement:

- Some stakeholders identified potential intangible consumer benefits such as customer empowerment, autonomy and resilience, noting that these are not necessarily able to be captured within the standard economic cost benefit framework
- The AER acknowledges that some customers may value these intangible (or non-monetary) benefits and these benefits may factor into their decisions to purchase DER
- The AER agrees with the position of CSIRO/CutlerMerz, which noted that
  - Intangible benefits are part of the decision-making process of DER investment, as they are for many investments and purchases. Nevertheless, research indicates that most customers primarily invest in DER for financial benefits, and our assumption is that the value of intangible benefits not already captured within the methodology is small

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DER Expenditure Guideline

Intangible benefits

From the draft explanatory statement (continued):

- Although intangible benefits may accrue to DER owners, either through a willingness to pay a premium for investment in DER or to accept reduced revenue as a producer of electricity, these benefits are external to the electricity system
- Further, in line with the RIT-D principles, credible options should maximise the present value of the net economic benefit to all those who produce, consume and transport electricity in the NEM

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DER Expenditure Guideline

Intangible benefits

Consumer perspectives:

- Strengthen “some customers” to “many customers”
- Don’t “assume” what customers value or how they value them

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DER Expenditure Guideline

Question 15: Do you agree with the proposed method for quantifying changes in DER investment?

The AER states:

- DER owners are considered to be producers of electricity, and this value stream recognises the changes in the costs that they face
- That is, an investment to increase DER hosting capacity may incentivise more or less customer investment in DER than would have otherwise been the case
- It represents a negative benefit (or a cost) where a network investment encourages additional DER (for example, customers purchase larger solar systems), and a positive benefit where a network investment encourages less customer investment (for example, customers no longer purchase batteries)

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DER Expenditure Guideline

Question 15: Do you agree with the proposed method for quantifying changes in DER investment?

The AER states:

- We agree that, to appropriately balance the costs and benefits of DER integration expenditure, the costs that DER customers pay should be considered in a cost-benefit analysis. This is in line with the total electricity system approach

Customers are unlikely to distinguish electricity system costs from other (society) costs

Not all customers are motivated by a robust cost-benefit analysis.

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DER Expenditure Guideline

Question 15: Do you agree with the proposed method for quantifying changes in DER investment?

Customers value DER differently and for different reasons

- Some are the profit maximisers of neo-classical economics
- Some want renewable generation because its the right thing to do by the planet
- Some just want a big more certainty about lower energy bills

It would be a big mistake to attribute common motivation and common perspectives of benefit to all customers

Whatever the DER assessment approach, there needs to be clear and consistent communication to customers about the rules and expectations of DER to help inform customer spending choices and to support realistic expectations of likely benefits from DER, including potential for constraints on exports

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DER Expenditure Guideline

Question 15: Do you agree with the proposed method for quantifying changes in DER investment?

By way of analogy, a tax cut may give me an opportunity to buy a bigger more expensive car than I otherwise would. That increases my costs but my expectations of the extra comfort are perceived benefits. What the tax cut did was enable me to consider a different [cost-benefit] analysis that otherwise was outside my grasp.

Customers may also be incentivised (or otherwise) to disconnect from the grid entirely. How are those effects on the customers themselves and on other customers as a whole captured in the modelling?

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DER Expenditure Guideline

Question 15: Do you agree with the proposed method for quantifying changes in DER investment?

- SAPN's submission noted that customer investment in DER will not be materially incentivised by distributors investing in network hosting capacity
- SAPN also noted that a customer's decision to invest in DER of sufficient size and configuration to generate excess energy to export will primarily be incentivised by market participants such as retailers and VPPs who directly deal with and sell DER products and services to customers

We agree that a customer's decision making is most likely to be influenced by those who directly deal with and sell DER products and services to customers.

But those parties' activities, what they offer consumers, and the information they provide to consumers will all be influenced by the underlying factors including the network hosting capacity

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DER Expenditure Guideline

Questions / comments welcome

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Q & A / discussion

Next steps

- Submissions close 31 August
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