

Explanatory note: Connection Charge Guideline review

Static zero limits for micro
embedded generators

October 2022

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Contents

1	Purpose of this paper.....	4
	Scope of this review	4
	Background	5
	Review to date.....	6
2	Key issues and questions for consultation	7
2.1	Exploring circumstances where a distributor may seek to impose a static zero limit	7
2.2	Interaction between new and existing systems	9
2.3	Assessment required to impose a static zero limit.....	10
2.4	Information to be provided to prospective customers	12
2.5	Regulator approved expenditure and zero static limits	14
2.6	Conditions to be met in the limited circumstance where a static zero limit may be imposed	15
2.7	Cost to remove network constraints	17
2.8	Charges applicable to customers willing to pay for network augmentation that does not meet the economic test	18
2.9	An emissions objective to be included in the NEO	19
3	Next steps	20
	Attachment A.....	21
	Relevant clauses of the NER	21

1 Purpose of this paper

As required by changes made to the National Electricity Rules (NER) in August 2021, we are reviewing our Connection Charge Guideline to describe the circumstances (or how to determine the circumstances) under which a Distribution Network Service Provider (distributor) may offer a static zero export limit (static zero limit) to a micro embedded generator seeking to connect to the network.

Our proposed changes to the Connection Charge Guideline for consultation in light of the above NER changes are included in new chapter 7A of the draft guideline.

The purpose of the Connection Charge Guideline is to guide distributors to prepare their connection policies for each regulatory control period for our approval as a part of the five-yearly distribution determination process.¹

Changes to the Connection Charge Guideline do not immediately affect customers. The changes only affect customers after we approve distributors' new connection policies which will take effect after the next round of distribution determinations.

This means the new arrangements will officially commence from:

- 1 July 2024 for the Australian Capital Territory, New South Wales, Northern Territory and Tasmania
- 1 July 2025 for Queensland and South Australia
- 1 July 2026 for Victoria

A micro embedded generator is a generating unit contemplated by Australian Standard AS 4777 (grid connection of energy systems via inverters), which is a sub-class of distributed energy resources (DER). They are predominantly solar PV systems on residential properties (rooftop solar) but may also include larger units on commercial buildings up to 200 kW in size (the size limit permitted under AS 4777) and battery systems.

A static zero limit means that a customer is prevented from accessing the network to export electricity at any time.

As a part of our review process, on 16 August 2022 we published an issues paper for stakeholder feedback.² This Explanatory Note contains our analysis of stakeholder feedback and explains our draft positions. We are seeking stakeholder comment on the accompanying draft Guidelines.

Scope of this review

Small systems, like rooftop solar systems, and storage batteries installed behind the meter at residences are classified under the Rules as micro embedded generators. Distributed energy resources can also include larger units, such as grid-scale community batteries.

¹ NER Clause 6.7A.1(b)

² <https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/connection-charge-guideline-review-2022/initiation>

This review applies to all forms of *new* micro embedded generators that could inject energy into the grid, but the most common form is rooftop solar. For simplicity in this paper, we will refer to micro embedded generators as rooftop solar, recognising that when we refer to rooftop solar we are referring to the broader category.

Pre-existing rooftop solar systems are covered by original connection contracts between customers and their distributors. As a result, they cannot have a static zero limit applied to them unless that is included in the original contract.

Modifications to pre-existing systems, such as adding more solar panels, will be treated as a connection alteration.

Background

Previously, the Rules did not contain specific conditions around the treatment of exports of electricity from DERs. In August 2021 the Australian Energy Market Commission (AEMC) made a change to the Rules to recognise two-way flows of electricity (Rule change).³ The Rule change introduced a package of measures designed to support more DER – such as rooftop solar systems, battery storage systems and electric vehicles – to efficiently connect to the grid and move electricity distribution networks towards a smarter, enhanced system that can better manage the supply and demand dynamics of a distributed energy world.

Prior to these changes, the Rules did not prevent distributors from imposing static zero limits, even in situations where there was sufficient capacity available. However, under the changes to the Rules, distributors will not be able to impose static zero limits, unless:

- the customer makes a request, or
- an exception listed in the Connection Charge Guideline applies.

While the focus of the Rule change was to support more DER (including rooftop solar), the AEMC did not consider it appropriate to introduce a complete prohibition on distributors imposing static zero limits because there may be limited circumstances (for example, small pockets on the network) where it is efficient or necessary for distributors to apply them.

The new Rules require us to specify in the Connection Charge Guideline the circumstances (or how to determine the circumstances) under which a Distribution Network Service Provider may offer a static zero export limit to a micro embedded generator seeking to connect to the network. Attachment A sets out the relevant Rules requirements for this review.

Small customers might be able to connect rooftop solar at such locations, but a static zero limit means that a customer is prevented from accessing the network to export electricity at any time.⁴

³ AEMC, Access, pricing and incentive arrangements for distributed energy resources, Rule determination, 12 August 2021.

⁴ AEMC, Access, pricing and incentive arrangements for distributed energy resources, Rule determination, 12 August 2021, p.i.

Review to date

On 16 August 2022 we published an Issues Paper for stakeholder feedback. This feedback, along with feedback from our stakeholder forums, has been included in the analysis in this explanatory note.

Accompanying this explanatory note is a draft Guideline for comment, which contains the implementation of the AER's draft positions.

Please provide your submissions to the draft Guidelines to:

Mr Warwick Anderson

General Manager, Network Pricing

Australian Energy Regulator

GPO Box 3131

Canberra ACT 2601

Or by email to connectionchargeguidelinereview@aer.gov.au with title: *Submission to draft Guideline*

Please provide submissions by 21 November 2022.

2 Key issues and questions for consultation

This section outlines our consideration of the key issues we explored in developing draft amendments to our Connection Charge Guideline. In developing these amendments, we have considered:

- **the National Electricity Objective (NEO)** – *to promote efficient investment in, and efficient operation and use of, electricity services for the long-term interest of consumers of electricity with respect to:*
 - (a) *price, quality, safety, reliability and security of supply of electricity*
 - (b) *the reliability, safety and security of the national electricity system*
- **NER clause 5A.E.3(b)(3)**, which provides that *the purpose of the connection charge guidelines is to ensure that connection charges limit cross-subsidisation of connection costs between different classes (or subclasses) of retail customer.*

2.1 Exploring circumstances where a distributor may seek to impose a static zero limit

Rooftop solar can provide benefits to customers but can also contribute to voltage management, network equipment safety and power quality issues when exporting power to the electricity grid.^{5,6} It can also potentially distort voltage at a customer's connection point beyond the limits set by jurisdictional regulations. As a result, how much additional rooftop solar outputs are injected into the network may need to be controlled where the local network is saturated with existing rooftop solar systems.

Providing unlimited DER export hosting capacity may result in distributors overinvesting in the network, which could result in higher network tariffs than otherwise would have been the case.

If operational means cannot improve rooftop solar hosting capacity – for example, by reducing the voltage level – the other solution is for the distributor to augment its local network (mainly the local transformer and low voltage line). There will be situations where augmenting to provide additional DER integration capacity (including rooftop solar) to avoid imposing an export limit is a prudent and efficient decision by the distributor. Under these circumstances, imposing a static zero limit would be inappropriate. This view is consistent with the AEMC's policy direction, as expressed in its final determination:

... the application of a static zero export limit should be kept to a minimum (if used at all) where a DNSP's determination has approved expenditure to support improvements to the network's capacity to connect more DER.⁷

⁵ The Victorian Government's *Voltage Management in Distribution Networks Consultation Paper* provides a detailed explanation on Voltage management issues (see <https://engage.vic.gov.au/voltage-management-in-distribution-networks-consultation-paper>).

⁶ At times when there is a high export levels from rooftop solar coinciding with very low energy consumption, thermal limits in some transformers may be exceeded to beyond the safety limit.

⁷ AEMC, Access, pricing and incentive arrangements for distributed energy resources, Rule determination, 12 August 2021, p.iv.

However, there will be situations where augmentation is not a prudent and efficient investment; namely, where the costs of augmentation outweigh the benefits of doing so. Any inefficient investment will result in customers paying more than necessary for the distribution services they receive.

Issues Paper Question 1

Under what limited circumstances should distributors be able to impose static zero limits?

Stakeholder feedback and AER position

Most submissions indicated broad support for the ability of a distributor to apply static zero limits under certain circumstances, other than when requested by the customer.

Most submissions referred to the (technical, economic and dynamic response systems) conditions proposed in the Issues Paper. The conditions proposed in the Issues Paper are repeated in this paper at section 2.6.

CitiPower, Powercor and United Energy (CPU) raised concerns that the economic and technical considerations proposed in the Issues Paper are more narrowly defined in scope and more onerous to demonstrate compliance than anticipated in the AEMC final determination. However, most other submissions (including from other distributors and from Simply Energy) were broadly supportive of the proposal (at least in general terms) in the Issues Paper.

In view of the above, we consider that, on balance, the technical and economic considerations to be met by a distributor before it is permitted to offer a static zero limit (other than when requested by a customer) as proposed in the Issues Paper are appropriate. We hold this view because the conditions proposed in the Issues Paper provide a high hurdle before a static zero limit is applied. At the same time these conditions allow for a static zero limit where the costs are likely to be prohibitive. For example, a zero static limit would be able to be applied to a customer connected to a single wire earth return line in a rural area. Allowing such a customer to export could risk the integrity of the connection.

To this end, we have implemented this position in the draft Guidelines at clauses 7A.1.1(a) and 7A.1.1(b).

In addition, in the Issue Paper we also raised the prospect of distributors being prevented from offering a customer a static zero limit in the circumstance, notwithstanding the technical and economic tests being met, where a customer's rooftop solar system has a suitable dynamic response system as specified by the distributor.

While several submissions (including from distributors) were supportive of the 'dynamic response system' condition, CPU and Energy Networks Association (ENA) raised concerns that dynamic response systems are not yet widely used by distributors and, as a result, it should not be included as a condition for not offering a static zero limit.

We consider that the benefits of implementing a 'dynamic response system' would deliver value to the customer and/or the wider network users and achieve the NEO; therefore, it is appropriate to implement this condition into the Guidelines, at clause 7A.1.4.

However, because the required technology and infrastructure are not yet fully developed in some parts of the network and/or customers' equipment, and in light of concerns from CPU and the ENA, the draft Guidelines make it clear that the clause would not apply where a distributor has failed to identify a suitable dynamic response system in a particular location.

We expect that static zero limits will only be imposed in very limited situations, such as, for example:

- if a quantity (even if only small) of exports from a new rooftop solar system is likely to cause technical and safety issues on the network, and
- It is not economic to upgrade the local network to allow the export, and
- There are no other means to manage the exports (such as a suitable dynamic response system).

This is consistent with the policy position in the AEMC's Final Decision:⁸

The changes clarify that customers can only be given static zero export limit under certain circumstances specified under AER's connection charge guideline and create regulatory oversight of DNSPs' decisions to offer zero export limits. This should minimise instances of customers being inefficiently limited to static zero exports and thus enable more customers to access export services. By enabling customers to receive access to export services on fairer and more efficient terms, these changes will therefore promote efficient use of export services in the long-term interest of customers. The changes will also support greater uptake of DER by customers by enabling them to access export revenue streams such as feed-in-tariffs.

Indeed, in its submission SA Power Networks stated that it is yet to impose static zero limits on customers with rooftop solar.

2.2 Interaction between new and existing systems

Where a new rooftop solar connection is at the end of a low voltage line, it could contribute to an increase in the voltage of the street mains upstream from the point of connection of new rooftop solar. If this happens, unless new rooftop solar systems are subject to some form of control, pre-existing rooftop solar customers will lose some of the benefits that would otherwise accrue.

This presents an equity issue between new and existing PV connections. If a new rooftop solar system connects it can adversely affect pre-existing customers, but a static zero limit can only be applied to new or significantly altered existing connections.

Issues Paper Question 2

Under what circumstances should we take into account equity issues when considering the application of static zero limits?

⁸ [AEMC Rule change - final determination](#), P55.

Stakeholder feedback and AER position

The Issues Paper sought feedback on a narrow interpretation of equity – that is, where a new rooftop solar system connects that adversely affects pre-existing customers, but a static zero limit can only be applied to new or significantly altered existing connections.

Stakeholder submissions addressed various aspects of equity, rather than the specific question asked in the Issues Paper. While noting that various aspects of equity are present in a network experiencing a significant uptake of rooftop solar, it was noted that there was not much scope to address these concerns within the context of static zero limits.

Having said that, Endeavour Energy's submission suggested that the effective means to address the equity issue is through cost-reflective network charges.

We agree that it is not practical to address the equity issue through the Guideline, and therefore no specific clauses have been included.

2.3 Assessment required to impose a static zero limit

To decide on the terms and conditions of each new rooftop solar connection, the distributor collects all the relevant information on the supplying transformer and the associated low voltage feeder in terms of voltage, load and solar output profiles. The distributor then assesses the new connection's impact on power quality based on the physical distance from the transformer and the local network configuration.

Currently, only Victorian distributors have full operational information of their distribution transformers because of the almost 100% smart meter coverage in that state.

Distributors in other states and territories do not have a similar level of information as their Victorian counterparts. To gather such detailed information can be costly and time-consuming.

We think there is a balance to be achieved. At the more detailed end, a full power quality survey could be costly and time-consuming. At the less detailed end, a 'standard approach' may be relatively simple to apply.

A follow-on issue is whether the requesting customer should fund some or all of the cost of the assessment.

Issues Paper Question 3a

What are your views on networks using a 'standard approach' to decide on whether to impose a zero export constraint for each individual application?

Issues Paper Question 3b

If you consider a 'standard approach' to be inappropriate, what depth of analysis or study should networks be required to do in the limited circumstance where a static zero limit may need to be imposed? What would be the likely costs of this level of study? Should the costs of the study be charged on a requester or treated as a general network administration cost?

Stakeholder feedback and AER position (3a)

We note that with almost 100% smart meter coverage in Victoria, this issue is less relevant for Victorian distributors, as evidenced by submissions.

Other submissions noted that each distributor's network is different and that a standard approach applying equally to all distributors (a 'one-size-fits-all' approach) would be problematic. In addition, submissions noted that the requirement to undertake bespoke assessments would be prohibitively costly.

However, several submissions suggested a distributor-specific standard approach and that distributors be required to display that approach on their website.

Endeavour Energy further suggested that assessment details could be included in distributors' connection policies (which are approved by the AER).

We consider that, in light of the above, it is reasonable for each distributor to determine its own standard assessment approach. We consider that it would be reasonable for distributors to be required to include their assessment processes on their websites. We consider also that requiring distributors to include the assessment process in their connection policies would provide a level of oversight, because distributors' connections policies are reviewed and approved by the AER.

The features we consider should be addressed in the standard approach include:

- The identification of network limitations caused by constraints such as (but not limited to):
 - thermal issues
 - voltage issues
 - protection systems.

This is to identify the elements that prohibit the micro embedded generator from exporting into the existing network.

- Network expenditure has not already been undertaken to relieve these network constraints.

This is to make sure that the network constraints would not be alleviated in the near future.

- The distributor must undertake a cost benefit analysis to identify that a static zero limit is the least cost option for addressing the above network constraints.

This is to make sure that the distributor has assessed all the avenues to deliver the best outcome to the prospective customer and the existing network users.

- Provided the connection applicant is not utilising a suitable dynamic response system, the distribution network service provider can apply a static zero export limit if it is the least cost option

This requirement is to test that the final outcome achieves the NEO.

We have implemented this position in the draft Guidelines at proposed clause 7A.1.3.

Stakeholder feedback and AER position (3b)

Several submissions supported the adoption of a distributor-specific standard assessment approach. Some submissions also suggested that bespoke analysis outside of a standard approach would be costly and time-consuming and that the cost should be borne by the requester.

In light of the above, we consider that a distributor-specific standard approach is appropriate. Therefore, the Guidelines are not required to reflect bespoke costs.

2.4 Information to be provided to prospective customers

Customers are entitled to adequate information from a distributor when the distributor proposes a static zero limit. Such information could include:

- a clear explanation of the methodology, data and calculations used to determine that the best technical, economic and social outcome was for a static zero limit to apply in a specific part of the network
- access to independent technical expertise to review the distributor's analysis and the connection offer
- how to access dispute resolution processes.

Currently, there is no concise information to guide customers on how to choose the right rooftop solar system size. We understand that many customers seek initial advice from solar PV retailers. We also understand that sometimes customers may not be provided with sufficient information at this point of contact to enable them to make a fully informed choice.

We consider that meaningful customer information and education is important to promote good customer choice and the installation of appropriately sized rooftop solar systems that maximise benefits to customers.

We understand that most customers don't discuss their preferred solar system size with distributors before making an investment decision. Indeed, it is significantly more likely that prospective customers would expect to receive all relevant information at the point of sale.

Many customers choose systems whereby they seek to maximise the benefits from a combination of self-consumption and exports. For this reason, it is critical that prospective customers have full information up-front, before making a purchase. This would avoid the customer's investment being significantly compromised by the unexpected imposition of a static zero limit.

Although we can mandate the information that distributors provide to customers, we do not have the same powers where rooftop solar suppliers and installers are concerned. Noting the importance of this issue, in our Issues Paper we sought feedback on how relevant information could be better made available to customers before they make a purchase.

Issues Paper Question 4a

What information should the distributor provide the connection applicant when a distributor proposes a static zero limit and how should that information be provided?

Issues Paper Question 4b

What's the best way to communicate the steps to inform customers' investment decisions? For example:

- What type of information should customers be provided with, when should it be provided and by whom?
- Who is best placed to provide effective customer education before a customer makes an investment decision?

Stakeholder feedback and AER position (4a)

Submissions broadly supported that distributors should provide customers to be offered a static zero limit with reasons why the limit is to be applied. This position has been implemented in proposed clause 7A.1.5 (a)

Several submissions were also supportive of customers having access to information that provides an overview of the assessment approach used by the distributor, and information on how to access dispute resolution processes, which may be provided via a distributor's website. This position has been implemented in proposed clause 7A.1.8.

Although not mentioned in submissions or the Issues Paper, we also consider it would be appropriate to require distributors to make customers aware of the option of installing a suitable dynamic response system as specified by the distributor. This is to make sure that we achieve the objectives of updating this Guideline and the relevant Rule change and is also in keeping with the conditions proposed in the Issues Paper for not applying a static zero limit. This position has been implemented in proposed clause 7A.1.5 (b).

Chapter 5A of the NER sets out the deterministic dispute resolution process. However, to assist applicants to understand the technical aspects of why a static zero limit is being imposed, distributors should also provide information on alternative dispute resolution channels available to the applicants. The alternative dispute resolution bodies could include the relevant Ombudsman Schemes.

Stakeholder feedback and AER position (4b)

Responses varied on who is best placed to provide information to prospective customers before they make investment decisions. Some respondents considered responsibility rested with retailers, installers and solar suppliers (or peak bodies like the CEC), whereas some respondents felt it was distributors' responsibility.

Indeed, some distributors already include appropriate information on their websites.

As pointed out in the Issues Paper, we do not have powers to mandate that rooftop solar suppliers and installers provide information to prospective customers. However, we can mandate the information distributors must provide customers.

To this end, we have implemented the requirement for distributors to publish on their websites their policies on how they will impose a static zero limit in proposed clause 7A.1.8.

We consider this to be a reasonable requirement given that this already appears to be standard practice among some distributors.

2.5 Regulator approved expenditure and zero static limits

The network may expand over time and be funded to do so through regulatory determinations. Depending on the work and the funding provided it may be the case that a static zero limit is not warranted.

This is consistent with the AEMC's policy direction, as expressed in its final determination:

...the application of static zero export limit should be kept to a minimum (if used at all) where a DNSP's determination has approved expenditure to support improvements to the network's capacity to connect more DER.⁹

Issues Paper Question 5

Are there exceptional circumstances where it would be appropriate for a distributor to impose a static zero limit where it has already been funded under revenue determinations to augment the network?

Stakeholder feedback and AER position

Most submissions from distributors agreed that there are circumstances where it would be appropriate for a distributor to impose a static zero limit where it has already been funded under revenue determinations to augment the network. Endeavour Energy submitted that static zero limits should generally not apply where a project to increase hosting capacity in a location is proposed and funded in a determination.

The CEC also noted that there could be a timing element involved, and that there would need to be a process for relaxing the zero export limit after the network is augmented.

Reasons from distributors for the Guidelines not prohibiting the application of a static zero limit where they have been funded to augment the network included the non-homogeneity of networks and the approach would be ex-post as opposed to ex-ante. They also pointed out that there is also a time lag between the funding approval and the completion of the actual augmentation works to remove such constraints.

Distributors are funded to meet their regulatory obligations and to improve rooftop solar hosting capacity where it is prudent and efficient to do so. However, funding is not generally location specific.

As a result, the draft Guidelines do not include an explicit prohibition on static zero limits where a distributor has been funded to augment the network. However, we do require

⁹ AEMC, Access, pricing and incentive arrangements for distributed energy resources, Rule determination, 12 August 2021, p.iv.

distributors to consider this aspect when doing their assessment and we have included this point in our assessment principles.

2.6 Conditions to be met in the limited circumstance where a static zero limit may be imposed

Our view in our Issues Paper was that there should be a clear set of conditions to be satisfied in the limited circumstance where a zero export limit is imposed. In addition to the assessment and information requirements discussed above, we considered that conditions related to the state of the system and cost-benefit analysis should also be met.

This recognises the critical nature of the circumstances relating to the physical network (including meeting critical physical requirements such as voltage levels) as well as taking into account circumstances where the cost of augmenting the network may be prohibitively high. Based on our assessment of the technical and economic requirements we proposed an initial set of conditions for consultation in our Issues Paper. The following conditions were also discussed at our stakeholder group sessions on the draft Issues Paper and the final Issues Paper.

1. The export from rooftop solar will result in the distributor not meeting a regulatory obligation or maintaining the network within its technical limits – for example, not meeting the voltage level and power quality standards, safety requirements of the relevant jurisdictional regulations and network security requirements (the technical consideration), *and*
2. The cost of augmenting the distributor's network assets to allow a reasonable export capacity level by the rooftop solar connection applicant outweighs the benefits arising from providing the additional export capacity, taking into consideration the expected future new distributed energy resources that will be able to be exported to the grid arising from the augmentation (the economic consideration).
3. Notwithstanding meeting the technical and economic tests, a distributor cannot impose a static zero limit if the rooftop solar system has a suitable dynamic response system as specified by the distributor. Such a dynamic response system could set a limitation on the timing of export – for example, not allowing the affected rooftop solar system to export during the middle of the day when other rooftop solar systems are exporting at a maximum level and when the voltage is high, but allowing batteries to export during the evening peak load demand hours to support the network.

We expect that, as the electricity system develops, there will be less need for static zero export limits to protect the system. Our position in our Issues Paper was that distributors should undertake periodic reviews to check whether the static zero limit can be lifted in the limited circumstance that it is imposed in the first place.

Issues Paper Question 6a

What conditions must be met in the limited circumstance that a static zero limit is applied?
Do you consider the above three controls adequate?

Issues Paper Question 6b

In the limited circumstance that they are imposed, should static zero limits be subject to regular review? If so, what should the length of the period be?

Stakeholder feedback and AER position (6a)

The assessment covered under question 1 applies here also. It is important to note here, however, that conditions 1 and 2 above must both (i.e., it is not an 'or' condition) be met if a static zero limit is to be applied.

Stakeholder feedback and AER position (6b)

The CEC considered that static zero limits should be reviewed regularly, at intervals not exceeding the duration of a regulatory determination. Simply Energy supported regular reviews. The ECA proposed a 5-year review, whereas the AEC proposed an annual review of the restriction.

The majority of distributors did not support an explicit obligation for regular review, mostly because of the cost and resources required to do so. Instead, they preferred to link reviews to a material change in network circumstances, such as network augmentation. CPU stated that it already undertakes reviews on a targeted basis as part of network upgrades.

We consider that the requirement to review a customer's static zero limit following augmentation that will lead to the removal of the static zero limit is reasonable and is consistent with the position proposed by most distributors. The implementation of this position is contained in proposed clause 7A.1.7.

However, we also agree with submissions that generally support regular reviews. This would place a discipline on distributors to consider the proactive removal of static zero limits not related to other network events. Therefore, we propose that a customer with a static zero limit under 7A.1.1 may seek a review of this limit 5 years after the connection is completed and that the requirement should be included in distributors' model standing offer. While it could be argued that the review period could be longer or shorter than 5 years, we consider the period of 5 years allows for a balance between the cost to the distributors to undertake an assessment and the potential financial loss to consumers as a result of not being able to export to the grid.

Given that there are likely to only be limited circumstances where this could occur, we consider this would not be an onerous task for affected distributors. The implementation of this position is contained in proposed clause 7A.1.6.

It should be noted that reviews may be triggered by events other than network augmentations. Other developments could also increase the rooftop solar hosting capacity of local areas, for example new community batteries could absorb more rooftop solar output and lead to removal of some static zero constraints.

2.7 Cost to remove network constraints

There may be locations in distribution networks where the existing level of rooftop solar has reached a saturation level.¹⁰ At such locations, to avoid imposing a static zero limit, the relevant distributor may need to augment the network (mainly the local supply transformers).

As explained above, there may be situations where augmentation is not a prudent and efficient investment to increase hosting capacity; namely, when the cost outweighs the benefits. Any inefficient investment will result in customers paying more than necessary for the distribution services they receive.

The typical costs to upgrade a local supply transformer range between:

- \$25,000 to \$50,000 for power pole mounted transformer upgrade, including potential upgrades to overhead hardware
- \$100,000 to \$250,000 for ground mounted substation upgrade.

The individual cost for each location may not be substantive but, when a network is approaching saturation of rooftop solar, the overall cost to increase rooftop solar hosting capacity across the entire network can be significant.

Issues Paper Question 7

At locations where it is not prudent nor efficient to augment the local network to increase the rooftop solar hosting capacity, should customers bear the cost for network augmentation if they wish to avoid export limitation?

Stakeholder feedback and AER position

With the exception of the ECA,¹¹ most responders were in agreement that: at locations where it is not prudent nor efficient to augment the local network to increase rooftop solar hosting capacity, customers should bear the cost for network augmentation to avoid export limitation.

We consider that if the cost to remove the constraint outweighs the benefit, the specific customer should pay for the cost to remove the constraint. Otherwise, this would lead to capital expenditure that is neither efficient nor prudent. We consider that this is a reasonable approach but note that the cost of augmentation would be prohibitive for most customers.

Proposed clauses 7A.1.10 and 7A.1.12 outline our proposed charging methodology for residential and non-residential customers, respectively, who seek to fund a network augmentation to remove a static zero limit where it is not prudent nor efficient to augment the local network to increase the rooftop solar hosting capacity.

¹⁰ A level of concentration of DER that any further new DER connection could impact on the power quality of the local network.

¹¹ ECA submitted that “the cost should be shared proportionally among all consumers and solar customers, depending on whom benefits the most. All solar customers, even existing ones, should bear the cost. There is also a critical temporal aspect to this. Making an individual consumer pay for a network upgrade that might in 10 years, when EV uptake increases, for example, becomes necessary anyway.”

2.8 Charges applicable to customers willing to pay for network augmentation that does not meet the economic test

If a connection applicant wants to pay to remove an export constraint, this distribution service will likely be charged under the alternative control service category. This is because the augmentation will not meet the capital expenditure criteria under the NER and will not benefit other network users.

In our Issues Paper we considered that the charge should be the net cost to the distributor between (1) the actual cost to remove the static zero export constraint netted off by (2) the net present value (NPV) of the export charge revenue received from the connection applicants and the projected future additional PV connections over a 30-year period.¹² That is, (1) minus (2).

Our Issues Paper proposed that the above charging method could be included in distributors' connection policies, which we approve at each distribution determination. This charging method is similar to the 'cost revenue test' under clause 5.1 of the current Connection Charge Guideline.¹³

Question 8

Do you consider that the above charging practice is reasonable? If not, what do you consider is a reasonable charging practice?

Stakeholder feedback and AER position

Those stakeholders that commented on this question were broadly supportive of the charging practice proposed in the Issues Paper. Jemena considered the proposed charging practice to be reasonable and consistent with the revenue and pricing principles in the NEL.

However, we note that CPU was not supportive of the proposed approach for several reasons.

We consider the approach proposed in the Issues Paper to be robust and reasonable. The proposed approach is consistent with the cost revenue test in the current version of the Connection Charge Guideline. The proposed approach would allow the distributor to charge the customer seeking to augment the network (where it is not economic to do so), costs in excess of the revenue the distributor would expect to receive.

The implementation of our position is contained in proposed clauses 7A.1.10 (residential connections) and 7A.1.11 (non-residential connections).

¹² 30 years NPV incremental revenue calculation period is the standard time frame for residential customers under the AER's connection charge guidelines.

¹³ AER, *Connection charge guidelines for electricity retail customers*, June 2012. Clause 5.1.2 of this guideline specifies that 'A distribution network service provider may seek a capital contribution for standard control connection services from a connection applicant, if the incremental cost of the standard control connection services exceeds the estimated incremental revenue expected to be derived from the standard control connection services.'

The export charge revenue for projected future generator connections is proposed to be over a 15-year period for non-residential customers compared with 30 years for residential customers.

Proposed clause 7A.1.12 describes how the export charge revenue stream is to be calculated.

Proposed clause 7A.1.13 notes that clauses 7A.1.10 (residential connections) and 7A.1.11 (non-residential connections) do not apply if the relevant distribution service is not classified as an alternative control service in the relevant distribution determination.

2.9 An emissions objective to be included in the NEO

The communique following the energy ministers meeting of 12 August 2022 announced that Ministers agreed to fast track an emissions objective into the National Energy Objectives.¹⁴

This change will have an effect on how we assess distributors' capital and operating expenditure requirements. Hence, we have added to the Connection Charge Guideline that the economic consideration on whether to impose a static zero limit must be undertaken in accordance with the NEO prevailing at the time.

¹⁴ <https://www.energy.gov.au/government-priorities/energy-ministers/meetings-and-communiques>

3 Next steps

We are seeking feedback on the accompanying draft Connection Charge Guideline, with submissions due by close of business 21 November 2022.

Attachment A

Relevant clauses of the NER

The NER specifies that the purpose of the Connection Charge Guideline is to ensure that connection charges:¹⁵

- (1) *are reasonable, taking into account the efficient costs of providing the connection services arising from the new connection or connection alteration and the revenue a prudent operator in the circumstances of the relevant Distribution Network Service Provider would require to provide those connection services; and*
- (2) *provide, without undue administrative cost, a user-pays signal to reflect the efficient cost of providing the connection services; and*
- (3) *limit cross-subsidisation of connection costs between different classes (or subclasses) of retail customer; and*
- (4) *if the connection services are contestable – are competitively neutral.*

New Rule 5A.E3(c)(8) requires that the connection charge guideline must:

describe the circumstances (or how to determine the circumstances) under which a Distribution Network Service Provider may offer a static zero export limit to a micro embedded generator for the purposes of clause 5A.F.1(c)(2).

Notes:

Micro embedded generation connection means a connection between an embedded generating unit and a distribution network of the kind contemplated by Australian Standard AS 4777 (Grid connection of energy systems via inverters).

Predominantly micro embedded generators are solar panels on residential properties but also include battery systems.

New 5A.E.3(d1) requires that:

In developing guidelines dealing with static zero export limits for the purposes of paragraph (c)(8), the AER must ensure that static zero export limits are offered only where consistent with the purpose in clause 5A.E.3(b1), which may include where reasonably required due to:

- (1) *system limitations, whether in particular circumstances or at particular locations or otherwise; or*
- (2) *limitations on the capabilities of plant or equipment of Distribution Network Service Providers or retail customers.*

New 5A.F.1(c) prescribes that:

Where the connection applicant is a micro embedded generator, the connection offer must not specify a static zero export limit except:

- (1) *where the connection applicant requests the static zero export limit; or*
- (2) *in circumstances permitted by the connection charge guidelines.*

¹⁵ Rule 5A.E.3(b) of the NER