Incentivising and measuring export service performance

Draft report

November 2022

AUSTRALIAN ENERGY REGULATOR

Inquiries about this publication should be addressed to:

Australian Energy Regulator
GPO Box 3131
Canberra ACT 2601
Tel: 1300 585 165

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1 Executive summary

In August 2021, the Australian Energy Market Commission (AEMC) published its Access, pricing and incentive arrangements for distributed energy resources final determination (the Rule change). The Rule change amended the National Electricity Rules (NER) and National Energy Retail Rules and tasked the AER with delivery of a package of reform workstreams to strengthen customer protections and our regulatory oversight of distribution network service providers (DNSPs) provision of export services. These reforms will also provide stakeholders with useful information and insight about the quality of their export services.

1.1 Export service reforms subject to consultation

In August 2022 we published a consultation paper and sought stakeholder views on the following three interrelated reform workstreams:

- whether incentive arrangements for export services are fit for purpose. The AEMC found that incentive frameworks in the NER, if left unchanged, could incentivise DNSPs to reduce costs at the expense of export service quality. The Rule change requires the AER to undertake a review to consider arrangements (which may include a service target performance incentive scheme) to provide incentives for DNSPs to provide efficient levels of export services.
- the development of performance metrics to include in our first annual DNSP export service performance report. These reports will consider, among other things, the relative performance of each DNSP in providing export services, DNSPs use of static zero export limits and performance relative to export tariff offerings.
- how to best incorporate export services into our annual benchmarking report. The efficient provision of export services may see DNSPs invest to increase network hosting capacity. While the expenditures to provide export services are counted as inputs in the benchmarking models, the outputs associated with export services may not be fully recognised.

In this draft report we commit to several future actions and make recommendations for each workstream that we consider will best achieve the desired outcomes of the Rule change. These actions and recommendations are summarised below.

Actions and recommendations

Incentive arrangements

- We will not extend the Service Target Performance Incentive Scheme (STPIS) to export services in the immediate term. This is due to differences in underlying incentives and network conditions and limited evidence across distribution networks that customers are receiving export services that do not meet their expectations. These factors make it difficult to develop an incentive scheme that accounts for different network circumstances. We agree with stakeholders that there is also a lack of robust data necessary to implement a standardised incentive scheme that places revenue at risk.
- We will use reputational incentives to encourage networks to improve their delivery of export services. We will require DNSPs to collect and report information about export

service performance, and commencing in 2023, will report this information as part of our annual network performance report.

- We intend to introduce a new small-scale incentive scheme (SSIS) to permit DNSPs to propose bespoke incentive schemes in their regulatory proposals. A SSIS will provide flexibility for DNSPs to demonstrate that their own network conditions and customer expectations warrant a financial incentive to improve export service quality. Consultation on the new SSIS will commence when we publish our final report in March 2023.
- We will initiate a future review of incentive arrangements for export services by 2027. We consider that this timing will allow us to consider the effects of export tariffs and flexible export limits on export service quality and monitor DNSP performance against any bespoke incentive measures. It will also allow DNSPs to collect and report on a consistent performance metrics, which could inform a common financial incentive scheme in the future.

Performance reporting

- We intend to report on a range of contextual and performance metrics (provided in **Attachment B** and the **strawman information request** published alongside this draft report). Although 'involuntary export curtailment due to network constraints' represents an ideal metric, this is not currently measurable or cost effective to measure.
- For most metrics we consider that 2020-21 is a reasonable base year for DNSPs to report data, however we propose to collect some metrics from 2022-23 onwards due to limited data availability. We will complement our analysis of export service performance metrics in the inaugural report with qualitative analysis, to provide further context.
- We will continue consulting with stakeholders on the development of the inaugural report and issue an information request in early 2023 to collect 2020-21 and 2021-22 data. We will issue a separate information request to collect 2022-23 data to include in the inaugural report. We propose to publish the inaugural report in late 2023 as a version update of the 2023 electricity network performance report.

Benchmarking

- We will not develop an interim export services operating environmental factor (OEF) as there is insufficient data available to do so. We may reconsider this position in the future when more robust export services expenditure data is available.
- We consider that there is insufficient evidence to determine if export services are materially affecting DNSP productivity scores. We propose 'materiality checks' to test the effect of export services on benchmarking results, as well as the collection of new data to enable this testing and any future adjustments to the models that may be necessary.
- We propose to initiate a full review of the benchmarking models by 2027 to determine the materiality of export service impacts on the productivity results, the types of model adjustments need to account for these impacts, and the feasibility of successfully implementing the adjustments.

Review of AER guidelines

The Rule change also requires us to review and amend where necessary the Distribution Reliability Measures Guidelines (DRMG), demand management incentive scheme (DMIS) and demand management innovation allowance mechanism (DMIAM) (by 1 July 2023). Given our decision not to extend the STPIS to export services, we do not propose to amend the DRMG at this stage. We also consider that the DMIS and DMIAM remain fit for purpose and do not require amendments to account for export services. This draft report formally signifies the commencement of required consultation (under the distribution consultation procedures) on our reviews of these guidelines.[1]

1.2 Issues for stakeholder consideration

Incentive arrangements	Performance reporting	Benchmarking
• Timing of, and factors prompting, a future review of incentive arrangements • Reporting metrics to enhance reputational incentives • Developing a small-scale incentive scheme to allow for bespoke incentives • Amendments to demand management incentives	• Types of export service performance metrics • Process for developing the inaugural export service performance report	• Options for adjusting the benchmarking framework to account for export services • Testing the materiality of export services on benchmarking models • Accessing comparable data to enable testing and adjustments to models that may be necessary (longer term)

1.3 Next steps

We invite feedback from interested parties in response to the matters addressed in this draft report by **30 January 2023**. This feedback will support the development of our final report and our proposed approaches to incentive arrangements, performance reporting and benchmarking for export services.

We also intend to hold a workshop with stakeholders on the material covered in this paper on **6 December 2022**. Please register your interest (by 'purchasing' a free ticket) on Eventbrite to attend by **29 November 2022**.

[1] NER, cl. 11.141.2(b).

2 Introduction

2.1 Scope of review process

The Rule change aims to integrate more distributed energy resources (DER[2]) such as small-scale solar, batteries and electric vehicles into the grid. It requires distribution network service providers (DNSPs) to plan for providing export services. It also strengthens customer protections and our regulatory oversight.

In the consultation paper we published in August 2022 we noted that the scope of this review process is limited to the following workstreams:

- Review of incentive arrangements for export services – The AEMC found that incentive frameworks in the NER, if left unchanged, could incentivise DNSPs to reduce costs at the expense of export service quality. The Rule change requires the AER to undertake a review to consider arrangements (which may include a service target performance incentive scheme) to provide incentives for DNSPs to provide efficient levels of distribution services provided to retail customers for supply from embedded generating units into the distribution network.
- Developing performance metrics to include in the inaugural export service performance report – The AEMC considered enhanced transparency of export service performance would support more informed regulatory and policy decisions as well as more informed investment and operating decisions. To that end, the Rule requires us to prepare and publish annual reports on the performance of each DNSP in providing export services to customers over the previous year.
- Incorporating export services into the AER's annual benchmarking report – To the extent export services are not adequately captured in the productivity benchmarking, some DNSPs may receive relatively lower productivity scores than would be the case if export services were better reflected in the benchmarking models. This could impact how we assess the efficiency of their operating expenditure (opex) as part of the revenue determination process.

In addition to the matters under consultation, the Rule change also tasked us with:

- reviewing relevant guidelines to incorporate export services – we have reviewed and consider no amendment is necessary to the:
  - Distribution Service Classification Guideline
  - Cost Allocation Guideline
  - Expenditure Forecast Assessment Guideline.

[2] Where appropriate n this draft report, and more generally, we are seeking to replace the term 'distributed energy resources' (DER) with 'consumer energy resources' (CER), in recognition of the engagement from consumer groups on the rapidly growing energy ecosystem. CER includes devices and systems (such as solar PV, batteries and electric vehicles) located on the customer's side of the network connection (behind the meter), that are connected to the electricity distribution network and capable of exporting electricity to the grid and/or responding to price and remote-control signals to change export or consumption patterns. These can include both residential and commercial/industrial devices. The NER refers to these devices as embedded generating units.

- reviewing the Connection Charge Guideline – the AEMC determined that a DNSP will not be able to offer a static zero export limit to a small customer who is seeking to connect consumer energy resources (CER) to the network, unless it is requested by the customer, or an exception listed in the AER's connection charge guidelines applies. Our review of this guideline exploring the appropriate exceptions to this restriction commenced in August 2022 and we published draft guidelines in October 2022.[3]
- publishing export tariff guidelines – the AEMC found that price signals are an effective potential tool to promote efficient use of and investment in export services. The aim of the Rule change was to smooth demand for consumption and export services using pricing along with other regulatory control measures (e.g., investment tests) to reward customers for actions that better use existing infrastructure or improve network operations, benefiting all customers. We published our Export Tariff Guidelines in May 2022.[4]
- publishing the customer export curtailment value (CECV) methodology and associated values – The Rule change requires the AER to develop customer export curtailment CECVs. These values will help guide the efficient levels of network expenditure for providing export services and input into network planning, investment and incentive arrangements for export services. We published our CECV methodology and associated values in June 2022.[5]

We also published our DER integration expenditure guidance note in June 2022.[6] Consultation on that guidance commenced before the AEMC's Rule change process but forms an important component of stakeholder guidance about how DNSPs provide efficient levels of export services on their networks.

Figure 1 provides a graphical representation of these various Rule change-driven workstreams in the context of the distribution network regulatory framework, highlighting the projects that are the subject of this consultation paper. As Figure 1 demonstrates, there are synergies and inter-relationships between each of the workstreams being explored in the current consultation process but also the key interlinkages with each of the other workstreams outside the scope of this consultation. For example, consideration of a financial incentive for export services could use the CECV methodology and associated values as the basis for the value of any applicable financial incentive payment or penalty. Furthermore, the annual performance reports could report on a network's performance with respect to the number of customers that are subject to a static zero export limit.

[3] AER, *Connection Charge Guideline review 2022*, October 2022.

[4] AER, *Export tariff guidelines*, May 2022.

[5] AER, *Final CECV methodology*, June 2022.

[6] AER, *DER integration expenditure guidance note*, June 2022.

Figure 1: Graphical representation of inter-relationships between work streams

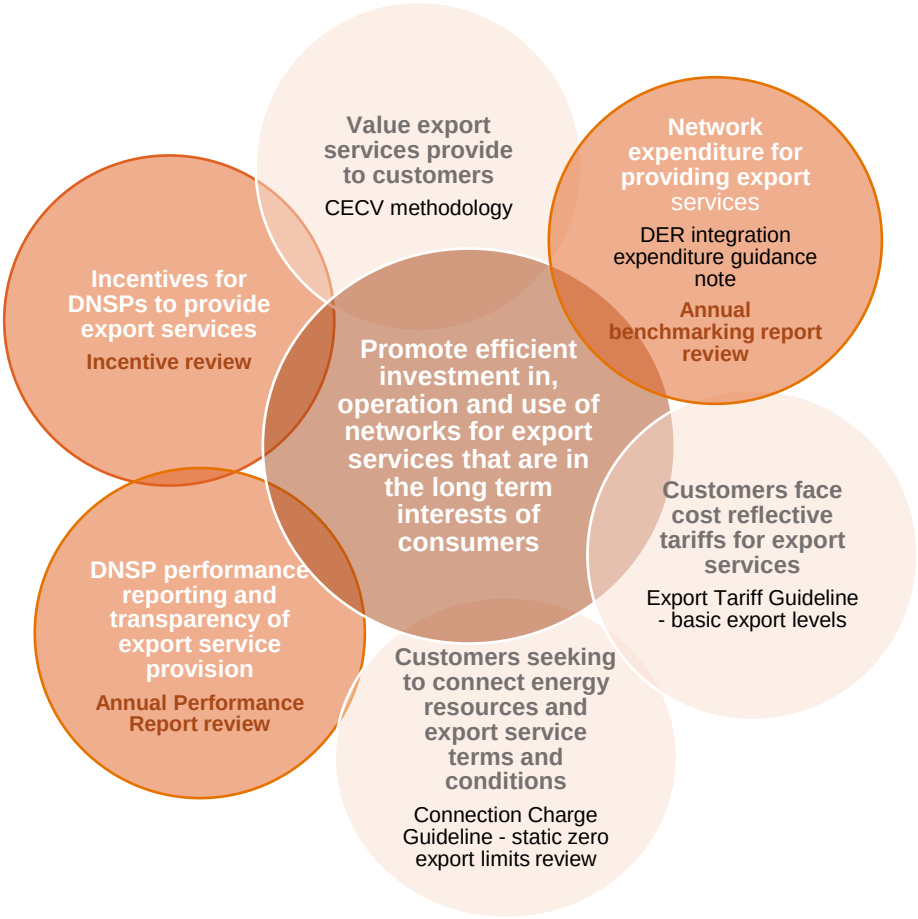

Table 1: Project timeline

Project step	Date
Consultation paper published	5 August 2022
Stakeholder workshop	22 August 2022
Submissions to the consultation paper close	30 September 2022
Draft report published	18 November 2022
Stakeholder workshop	6 December 2022
Submissions to the draft report close	30 January 2023
Publish final review report	Early March 2023

2.2 Request for submissions

This draft report discusses the key issues on which we seek feedback and includes questions for stakeholders to consider. For convenience, we have included a summary list of these questions in **Attachment A**.

We request all submissions be in Microsoft Word or another machine-readable document format.

We invite stakeholder submissions on this draft report by **30 January 2023** and will consider all submissions received by that date.

Please email submissions to exportservicesreview@aer.gov.au.

We prefer that all submissions are publicly available to facilitate an informed and transparent consultative process. Submissions will be treated as public documents unless otherwise requested. All non-confidential submissions will be placed on our website. Parties wishing to submit confidential information should:

- clearly identify the information that is the subject of the confidentiality claim
- provide a non-confidential version of the submission in a form suitable for publication.

3 Incentive review for export services

3.1 Background

The incentive frameworks in the NER, if left unchanged, could incentivise DNSPs to reduce expenditure, through the application of incentive schemes such as the capital expenditure sharing scheme (CESS) and the efficiency benefit sharing scheme (EBSS), without providing effective incentives for DNSPs in relation to export service performance. While the STPIS incentivises import service performance, it does not include performance measures related to export services, such as the frequency and volume of export curtailment.

Demand for export services is currently constrained in some locations across distribution networks. Moreover, constraints are projected to increase with higher demand for export services. Currently, around 30% of homes in the NEM have rooftop solar PV. AEMO forecasts that this will increase to over 50% in 2032 and will reach 65% of homes by 2050 (with most systems complemented by battery energy storage).[7] Network constraints will be amplified if the uptake of batteries and electric vehicles is not actively managed so that consumption aligns with passive rooftop generation. However, current evidence suggests that even within networks where CER uptake is high, export constraints are limited.[8]

In theory, the STPIS could be amended to provide a financial reward or penalty for DNSPs that improve or worsen their export service performance. While network export curtailment is an ideal metric for understanding export service performance, it faces several measurement and interpretation difficulties. In addition, many DNSPs have limited access to this data as visibility of low voltage network performance is lacking (due to a lack of smart meters and other voltage measurement devices). Noting that data quality is an essential element of a financial incentive mechanism such as the STPIS, and that it will be some time before DNSPs collect and report this type of data in a consistent manner, we should consider whether the implementation of short-term or interim incentive arrangements is suitable. We previously noted that there will be challenges in extending the STPIS to exports and we discussed a range of potential alternative or complementary options for incentivising improvements in export service performance in our consultation paper.

In the consultation paper we also sought stakeholder views on:

- the underlying incentives for DNSPs to provide export services and whether further incentives were needed to ensure that DNSPs provide efficient levels of export services
- our proposed objectives for assessment of the merits of enhancing incentives for export services
- the current low level of export constraints experienced by customers and whether this impacts the need to enhance incentives for the provision of export services

[7] AEMO, *2022 Integrated System Plan*, June 2022.

[8] See for example: Collaboration on Energy and Environmental Markets at UNSW, *Curtailment and Network Voltage Analysis Study Project Report*, August 2021, & Heslop, S. et al. (UNSW), *Voltage Analysis of the LV Distribution Network in the Australian National Electricity Market*, May 2020.

- the accuracy of potential data metrics necessary to support a financial incentive mechanism, how to value changes in service levels, whether a STPIS could feasibly apply and whether the AER should establish a paper trial to test potential export service metrics
- other options to incentivise improvements in export service performance, including guaranteed service levels (GSLs) for export services, bespoke export service incentive mechanisms, and allowance and margin mechanisms (like the DMIA and DMIS)
- the types of reporting measures likely to impose reputational incentives on DSNPs and whether these are sufficient.

In the following sections we summarise stakeholder views and provide our draft position on appropriate incentive arrangements for export services.

3.2 Stakeholder views

3.2.1 Underlying incentives

Some stakeholders submitted that further incentive measures are required to ensure that DNSPs provide efficient levels of export services. SA Power Networks submitted that there remains a clear role for service incentives in guiding the level of service that distributors should seek to achieve, across its customer base and over time. It noted that it has developed innovative capabilities to flexibly manage exports, and guidance is needed on the right level of curtailment that will best align expenditure with customer expectations.[9] CitiPower, Powercor and United Energy submitted that its customer values research identified that enabling export services is important to its customers as it delivers flexibility in how they use their energy resources and reduces carbon emissions. In line with these expectations, considered design of export service incentives is critical, and implementing a combination of different forms of incentives where they target different outcomes is appropriate.[10]

Other stakeholders did not support the introduction of further incentive measures at this time. The Public Interest Advocacy Centre (PIAC) noted that it is more concerned about the material possibility that DNSPs will maximise the size of the regulated asset base rather than seek an efficient level of curtailment. It saw no compelling evidence to recommend the use of financial incentives and suggested that investigations into financial mechanisms be deferred until export services are better established.[11] Similarly, the Australian Energy Council (AEC) suggested that once export price signals are in place, an incentive mechanism for export performance could be considered if export price signals fail to elicit a response.[12] TasNetworks highlighted that the characteristics of its network (where there is

[9] SA Power Networks, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[10] CitiPower, Powercor & United Energy, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[11] Public Interest Advocacy Centre, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[12] Australian Energy Council, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

less than 15% penetration of solar PV and therefore poor customer outcomes are unlikely) suggest that regulatory intervention is questionable.[13]

3.2.2 Objectives of incentivising export services

Stakeholders largely agreed with our suggested objectives of incentivising export services, and some suggested we consider additional objectives. The Consumer Challenge Panel (CCP) submitted that we must be careful not to encourage investment in export capacity at all costs. It also suggested that utilisation of assets is an important objective.[14] Evoenergy submitted that export service incentives should recognise and accommodate the fact that smaller DNSPs face a proportionally higher level of expenditure to provide export services.[15] Ergon Energy and Energex specifically supported the "enhance information disclosure" objective as the information is useful for customers and assists in making informed decisions. However, it noted that there is a risk that customers may be confused or overwhelmed with information if it's provided out of context.[16]

On a more general note, Energy Networks Australia (ENA) highlighted the importance of ensuring that export service incentives are flexible to accommodate the differing starting points of DNSPs (data quality, network visibility, network constraints etc.), different jurisdictional programs and future technology changes.[17]

3.2.3 Materiality of concern with incentives

Stakeholders largely agreed that, based on current evidence, the low level of export constraints suggests that the need to enhance incentives for the provision of export services is not urgent at this time. However, they recognised that more data is needed to validate current evidence. The CCP noted that, based on current evidence, there is a high degree of heterogeneity across consumers in different locations – some consumers do not suffer significant export curtailment, while others do.[18] ENA noted that DNSPs are proposing expenditure to support greater levels of exports on their networks, and so the materiality of any residual incentive concern is currently low. It suggested that despite this, there remains a role for export service performance incentives.[19]

AusNet Services submitted that without sufficient funding, or a financial incentive, to prioritise export service outcomes as the penetration and size of CER inevitably grows, the

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[13] TasNetworks, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[14] Consumer Challenge Panel, *Submission on incentivising and measuring export service performance consultation paper*, October 2022.

[15] Evoenergy, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[16] Ergon Energy & Energex, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[17] Energy Networks Australia, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[18] Consumer Challenge Panel, *Submission on incentivising and measuring export service performance consultation paper*, October 2022.

[19] Energy Networks Australia, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

average customer experience around export services is only likely to worsen over time.[20] Evoenergy submitted that constraints currently experienced by exporting customers, in most jurisdictions, are not a good representation of potential constraints exporting customers may experience in the future as exports start to exceed the intrinsic hosting capacity of the network.[21]

3.2.4 Options for providing incentives

Stakeholders provided a range of views on the best options (or combination of options) to incentivise DNSPs to provide export services. These options and associated issues are discussed in the following sections.

Extending the STPIS to export services

Stakeholders did not support extending the STPIS to export services at this time, citing differences in the levels of service experienced by customers and a lack of robust data to measure export service performance. CitiPower, Powercor and United Energy noted that levels of export curtailment among networks are currently low, and the customer detriment from export curtailment is less impactful than interruptions to consumption services. Further, a one-size fits all incentive scheme would not account for the varying circumstances between networks that could influence export service delivery, such as customer preferences on export limits and expenditure, the level of intrinsic hosting capacity, and data availability.[22] ENA submitted that a financial incentive mechanism requires accurate and robust metrics for setting the baseline performance and for measuring and valuing changes in performance. It also suggested that a one-size fits all financial incentive mechanism is not appropriate at this stage, as although a range of metrics are available, these currently lack accuracy and robustness on a national level, with clear differences in DNSPs' access to quality granular data.[23] PIAC noted that constraints are felt disproportionately by a small number of exporting customers, meaning the average quality of service measures within a STPIS are unlikely to target improvements in the quality of export services where they are most needed.[24]

Stakeholders recognised that data availability differs across distribution networks and collecting a consistent set of data is challenging. Endeavour Energy noted some of these challenges, including that several DNSPs had poor visibility of their low voltage networks and faced higher costs to acquire export information from third-party data providers. It also highlighted that metering and/or inverter data does not provide sufficient granularity to allow the reason for curtailment to be determined (e.g. whether curtailment is due to a constraint on the network or as a result of a change on the customer's side of the connection point

[20] AusNet Services, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[21] Evoenergy, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[22] CitiPower, Powercor & United Energy, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[23] Energy Networks Australia, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[24] Public Interest Advocacy Centre, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

such as equipment fault, change of load or self-consumption, or inclement weather).[25] Jemena noted for the STPIS, the NSW DNSPs collected data for one regulatory control period before the scheme came into operation. This highlights that the traditional approach to applying incentives is to have a robust historical dataset.[26]

The CCP did not accept the argument that information such as curtailment ratios and the volume of curtailment across peak is not available or too challenging. It noted that the information is critical to understand the quantum of the problem and to track the success of any changes to the incentive scheme. It also suggested potential options for resolving data issues, including networks acquiring inverter data from third parties, or the AER estimating curtailment volumes based on AEMO's methodology of calculating large-scale variable renewable energy (VRE) curtailment.[27]

Despite identifying significant challenges at the present time, stakeholders were supportive of establishing the fundamentals of measuring export service performance and developing a framework for a nationally consistent incentive scheme in the future. SA Power Networks suggested that factors that may inhibit such a scheme now may be transitional in nature, and there will in any case be long lead-in times in designing and implementing new incentives.[28] Endeavour Energy suggested that DNSPs should be given an opportunity to develop a robust and consistent dataset capable of measuring and monitoring export service performance to inform future baseline levels and service standards that align to the preferences of its customers.[29]

Valuing improvements in service quality

Stakeholders commented that using customer export curtailment values (CECVs) to value improvements or decrements in export service performance could be challenging in practice. Evoenergy submitted that, in principle, CECV would be appropriate, but is not a fixed value and may introduce unnecessary complexity to an export service incentive scheme.[30]

Ausgrid noted CECVs exclude potential customer's benefits such as avoided network investment and generation capacity investment[31] and observed that CECVs are zero for many 30-minute dispatch intervals. It suggested that this could create the implication that there is no reward or penalty at these times and is therefore likely to materially understate the actual value customers place on being able to export energy back to the grid.

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[25] Endeavour Energy, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[26] Jemena, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[27] Consumer Challenge Panel, *Submission on incentivising and measuring export service performance consultation paper*, October 2022.

[28] SA Power Networks, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[29] Endeavour Energy, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[30] Evoenergy, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[31] Ausgrid, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

Conversely, the CCP supported the notion that future declining CECVs mean that the value of improvements in export services are also likely to decline.[32]

Guaranteed service levels

Stakeholders were generally cautious about the potential use of GSLs for export services. CitiPower, Powercor and United Energy and SA Power Networks submitted that current GSL arrangements are inconvenience payments that are not intended to reflect the full economic compensation to customers for the failure to provide service delivery in recognition that it would not be economic for networks to invest to offset GSL costs. It suggested that a GSL scheme for export services (if enacted) should provide for cost recovery through opex allowances, acting as an equity transfer between customers.[33] [34] SA Power Networks further noted that in designing GSL eligibility criteria, a key consideration is likely to be whether some customers experience service performance below the deemed intrinsic hosting capacity of the distribution network, as this is intended to be the basic service offering that distributors must provide and which customers have paid for via their consumption service network tariffs. AusNet Services noted that providing GSL payments to small customers would not be consistent with the treatment of larger renewable generators, which are not compensated at times of network constraints.[35]

The CCP submitted that we should consider the extent to which GSL payments to exporting consumers effectively creates a cross subsidy through which non-CER customers incur welfare losses, as these payments will put upward pressure on energy bills for all consumers.[36]

Reputational incentives

Stakeholders were generally supportive of the AER enhancing reputational incentives. PIAC submitted that a reputational incentive could be delivered through the annual performance report for export services. It suggested that we develop the report with a view to informing customers on the presence and location of export constraints and increasing transparency on system limitations and their impact on the availability or use of distribution services.[37]

Ergon Energy and Energex submitted that, based on the current low level of constraint experienced and the low value of the CECV, a conservative approach to the introduction of export service-related performance incentives is warranted and reputational incentives are

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[32] Consumer Challenge Panel, *Submission on incentivising and measuring export service performance consultation paper*, October 2022.

[33] CitiPower, Powercor & United Energy, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[34] SA Power Networks, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[35] AusNet Services, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[36] Consumer Challenge Panel, *Submission on incentivising and measuring export service performance consultation paper*, October 2022.

[37] Public Interest Advocacy Centre, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

recommended in the short term.[38] AusNet Services suggested that data used for performance reporting should be contextualised for network or jurisdictional policies, e.g., network-specific basic export limits or jurisdictional voltage regulations. Without the context around factors that influence export performance reporting is likely to be positively biased towards networks with low CER connection activity and less stringent voltage regulations.[39]

Bespoke incentive schemes

Stakeholders were generally supportive of DNSPs having the freedom to develop their own bespoke incentive schemes. ENA submitted that it supports further exploration of a bespoke export service incentive scheme, which would allow DNSPs to design, in collaboration with customers, an incentive mechanism that aligns with the specific priorities of their customers. It suggested that, importantly, this will allow for an incentive scheme design that takes into account the different circumstances of distributors, including levels of data quality, network visibility, network constraints and customer preferences. It also suggested that we could use the learnings from any bespoke incentives to inform the design of any national standardised scheme over the longer term.[40]

SA Power Networks suggested that, in the short term, there is greater merit in allowing flexibility for distributors to consider designing bespoke incentives customised to their circumstances, in order to:

- work with the data that is available to them, rather than having to try and develop a NEM standardised set of performance data and metrics
- engage with their customers and customer panels on the design of incentives and the service performance outcomes and metrics that they most value
- ensure that incentives are compatible with their connection, tariff and export service offers to customers, particularly any flexible export service offers they may be providing customers.

SA Power Networks also suggested that, in applying any bespoke incentives:

- we could adopt a similar framework to its Customer Service Incentive Scheme (CSIS), where a shell was created by the AER to set the basic parameters, reporting and auditing requirements, but otherwise flexibility was provided to distributors to design their metrics and approach
- the financial revenue at risk/reward should be material enough to drive network decisions on hosting capacity, and the financial incentive should be in addition to/separate from the current CSIS and STPIS for consumption services to avoid weakening incentives to maintain/improve service performance for consumption services

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[38] Ergon Energy & Energex, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[39] AusNet Services, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[40] Energy Networks Australia, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

- each distributor should have the option to propose or not propose a bespoke incentive, and consider their respective circumstances, when that incentive could apply in a financial sense versus applying in a paper trial form for a period of time
- the learnings observed from transparent reporting against bespoke incentives could be used by the AER to inform the design of any NEM-wide standardised service incentive over the longer term.[41]

AusNet Services noted that it had already successfully developed the Customer Service Incentive Scheme (CSIS), which includes specific measures, baselines, and targets, through collaboration and co-design with its Customer Forum. It proposed two potential bespoke incentive schemes for export services:

- Incentivising a faster take-up of flexible export limits, where DNSPs are rewarded for increasing the number of customers connected to flexible exports.
- Incentivising export enablement for existing customers with constraints, where DNSPs are rewarded for reviewing and unlocking hosting capacity for customers that are on static export limits.[42]

The CCP submitted that it generally supports the introduction of a bespoke export incentive mechanism as it has the potential of encouraging a fair level of export capability with a greater level of transparency than inclusion in regulatory investment proposals. It cautioned that this option will likely face the same problems of defining appropriate parameters that are measurable, that reflect customer needs and are efficient. However, it also suggested potential parameters could include network utilisation, progress towards net-zero targets, and the take-up of flexible export schemes by consumers. [43]

Allowance and margin mechanisms

Stakeholders generally supported the use of mechanisms such as the DMIS and DMIA, whereby DNSPs could propose funding for specific projects associated with improving export capacity. Ergon Energy and Energex suggested that targeted projects may provide a better outcome for all customers and allow for consumer preferences and performance expectations to be more appropriately considered.[44] SA Power Networks suggested that several incentive mechanisms could be applied together to achieve differing but complementary goals, with the bespoke incentive serving as the primary financial incentive guiding service performance and an allowance/margin mechanism seeking to drive networks to identify and pursue new and innovative ways of maximising hosting capacity for DER. It submitted that both the DMIAM and DMIS should apply to export services, but that the maximum funding allowance of the DMIAM be reviewed on the basis that it is currently immaterial and has consistently been fully utilised. It also suggested that the DMIAM and

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[41] SA Power Networks, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[42] AusNet Services, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[43] Consumer Challenge Panel, *Submission on incentivising and measuring export service performance consultation paper*, October 2022.

[44] Ergon Energy & Energex, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

DMIS could potentially apply to fund trials and projects that may seek to target service improvements to specific network areas or customer segments that may not be addressed via the primary bespoke incentive (such as community energy initiatives supported by customers).[45]

PIAC submitted that allowance and margin mechanisms like the DMIA and DMIS are able to better target specific export service concerns than a STPIS adjustment approach but face similar data challenges. It also expressed its concern that financial incentives such as the STPIS, DMIA and DMIS will be duplicative as DNSPs are already able to fund improvements to export services through expenditure allowances. It noted that the current regulatory reset process suggests that further financial incentives for export services are unnecessary given that many DNSPs are proposing significant uplifts in investment to deliver a level of export service that meets customers' expectations.[46]

Paper trials

There was general support for the AER undertaking paper trials to test the robustness of potential export service metrics. However, there is currently no consensus on the performance metrics that should be tested. AusNet Services suggested that we further workshop proposed metrics for performance reporting with distributors and the industry, including any potential paper trial metrics for future updates to the STPIS.[47]

Ausgrid referred to the collaborative research by SA Power Networks, Essential Energy and the University of Sydney on export service performance,[48] and recommended that we explore a combination of different performance measures as part of a paper trial, instead of exploring measures individually, to mitigate perverse incentives or service outcomes and to better reflect the level of export service provided to customers.[49]

3.3 Draft position

Currently there are several related factors effecting the underlying incentive concern and its materiality across distribution networks. These factors stem from differences in the demand for export services, both at the network and sub-network level, which influences the extent of network constraints and consequent DNSP approaches to managing export constraints.

The level of PV penetration varies across jurisdictions and distribution networks. The estimated percentage of dwellings with solar PV installations ranges from around 18% in Tasmania to around 43% in Queensland and South Australia.[50] Exporting customers of distribution networks in areas with greater rates of solar PV are more likely to experience

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[45] SA Power Networks, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[46] Public Interest Advocacy Centre, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[47] AusNet Services, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[48] RaceFor2030, *Measuring and communicating network export service quality*, accessed 2 November 2022.

[49] Ausgrid, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[50] Australian Photovoltaic Institute, *Mapping Australian Photovoltaic Installations*, accessed 2 November 2022.

export constraints, either via the imposition of static or zero export limits, voltage-related curtailment, or dynamic export limits.[51]

In most cases, when a customer installs solar PV, they are provided with a static export limit by their DNSP. This limit sets the maximum level of export that the customer is allowed. The average size of a small-scale solar PV installation in Australia is increasing and has passed 8kW.[52] However, the standard export limit for a customer in most distribution networks has remained relatively static at 5kW for many years now. In some locations, DNSPs are applying limits that are lower than 5kW or even zero in some locations (to protect network assets). At present, static export limits are the primary source of export curtailment.[53]

Voltage-related curtailment automatically occurs due to standard grid support settings on PV inverters in response to high distribution network voltages. When this occurs, along with being unable to export electricity to the grid, customers are unable to self-consume their own generated electricity. Distribution networks in Australia generally have poor visibility of customer voltage, except in Victoria where there is a very high penetration of smart meters. Therefore, most DNSPs have historically relied on simple measures such as customer complaints (in response to quality of supply issues) to understand whether customers are experiencing voltage-related curtailment. More recently, and in response to these complaints, DNSPs have invested in low voltage monitoring programs to estimate network hosting capacity and the impacts of voltage-related curtailment. However, low voltage network visibility and understanding of network hosting capacity remains varied across distribution networks.

Dynamic export limits (or flexible export limits) can allow for more electricity to be exported to the grid by consumers, providing the opportunity for consumers to realise greater value from CER investments. DNSPs are in the process of developing or implementing flexible export limits. These limits are determined by a combination of prevailing conditions, power flow, and the available capacity of the local network. We are currently developing policy direction and advice to the Energy Security Board in relation to flexible export limits and their implementation in the NEM.[54] We expect that flexible export limits will reduce the potential for export constraints via both static export limits and voltage-related curtailment.

In summary, depending on their geographic location, customers are experiencing different export service levels and may have different expectations about the level of export service they should receive. Customers are guiding the investment decisions of their DNSPs, which are investing in additional network hosting capacity to allow:

- a greater number of customers to connect CER and export electricity to the grid, and
- greater export limits for all exporting customers (noting that customers may pay export tariffs to recover the costs of additional investments).

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[51] Currently most customer-exported electricity is sourced from solar PV, however exports from home batteries and electric vehicles are expected to become more prominent.

[52] Australian Photovoltaic Institute, *Market Analyses*, accessed 2 November 2022.

[53] Cadency Consulting, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[54] AER, *Flexible Export Limits – Issues paper*, October 2022.

However, because of differences in network characteristics (such as the availability of smart meter data) and DNSP strategies to manage network hosting capacity (ranging from static to flexible export limits), there is a lack of consistency in the data that could be used to measure service quality. There is no common method for assessing network hosting capacity, and we have previously noted that there are a range of modelling and analysis methods available to DNSPs.[55]

In deciding on the best current options for incentivising DNSPs to provide an efficient level of export services, we have considered the differences in customer experiences and expectations across distribution networks, how DNSPs intend to manage network constraints and improve export service quality, and the data DNSPs will require to demonstrate improvements in performance. In the following subsections we provide our draft positions for each option.

3.3.1 Extending the STPIS to export services

We do not intend to extend the STPIS to export services at this stage. In coming to this position, we have considered stakeholder submissions highlighting:

- differences in underlying incentives, network conditions and the materiality of concern across distribution networks. This makes it difficult to develop an incentive scheme that accounts for different network circumstances.
- a lack of robust data to support the implementation of a standardised scheme. This makes it very hard to objectively measure export service performance, and therefore rewarding or penalising networks would be inappropriate. We recognise that there are significant challenges in measuring voltage-related export curtailment. However, we do not consider that estimating curtailment volumes based on AEMO's large-scale VRE curtailment calculations would accurately reflect the varied characteristics of distribution networks.
- export tariffs and flexible export limits are at a nascent stage, and their impacts on export service quality are yet to be established.

Since we do not intend to commence developing a STPIS at this time, we also do not intend to consider the appropriateness of GSLs or the approach to calculating rewards and penalties. Relatedly, in our recent issues paper on flexible export limits we discussed the role of connection agreements in setting out the terms and conditions of network access for CER customers, and how these may change to provide flexible export capacity. We suggested that we should seek changes to connection agreements to establish sufficient consumer protections that apply consistently across the NEM. We also suggested that connection agreements should set out information to customers, such as operating parameters, conditions for the revision of flexible export limits, communication processes for changes to flexible export limits, consumers' compliance obligations and related commercial implications, including direct compensation or rebates on network charges if service levels are not achieved. [56]

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[55] AER, *Final DER integration expenditure guidance note*, June 2022.

[56] AER, *Flexible Export Limits – Issues paper*, October 2022.

As noted in section 2, this draft report signifies the commencement of consultation on our review of the DRMG. The DRMG establishes a set of common definitions of reliability measures that can be used to assess and compare the performance of DNSPs for all jurisdictions of Australia. These measures are used to set performance targets under the STPIS. Based on our draft position that we do not extend the STPIS to export services, we do not consider amendments to the DRMG are necessary at this stage.

We intend to commence a future review of incentive arrangements for export services by 2027. We consider that this timeframe will allow the export service to develop further across distribution networks and allow us to consider the effects of export tariffs and flexible export limits on export service quality. Our future review will consider the need for financial incentives (including GSLs and the approach to calculating rewards and penalties), reporting against any bespoke incentives and data availability.

Question 1

Do you agree that no amendments to the DRMG are necessary?

Question 2

Do you agree with our proposed timeline for a future review of incentive arrangements for export services? What factors may prompt an earlier or later review?

3.3.2 Reputational incentives

We will require DNSPs to collect and report information about export service performance. Commencing in 2023, our annual network performance report will include our inaugural export performance report. We consider that these reports will provide transparency, accountability, and reputational incentives to DNSPs in providing export services to their customers.

Performance reporting may not immediately involve direct comparisons between DNSPs, since their export service offerings may be quite different (for example, in their approach to export tariffs and flexible export limits). However, in the short term, it should serve as useful information for customers in understanding how network investments are reducing export constraints and leading to better service quality outcomes. Over time, it may become more feasible to directly compare DNSP performance related to aspects of the export service.

In section 4 (and detailed further in Attachment B) we discuss the proposed metrics for inclusion in the export service performance report. Reporting on a DNSP's export service performance, where no revenue is at risk (as there would be in the case of a financial incentive mechanism), may be done using less robust data. We recognise there may be challenges in collecting and reporting some of these metrics, and so qualitative information may be useful in supporting the reporting of these metrics.

3.3.3 Bespoke incentive schemes

We consider that bespoke incentive schemes can support reputational incentives and provide DNSPs with opportunities to demonstrate improvements in services where they are valued by customers. We recognise that a one-size fits all approach to financial incentives is

not appropriate at this stage, however doing nothing may not be a viable option for all DNSPs and their customers. Bespoke incentive schemes could serve as an interim measure until it is possible to introduce a standardised scheme for all DNSPs via the STPIS.

Allowing DNSPs to propose bespoke incentive schemes recognises that service levels, the presence of network constraints, customer expectations and quality data to measure export service performance differ across distribution networks, and financial incentives can lead to better outcomes for customers. However, when assessing a proposed bespoke incentive scheme, we would also need to consider funded levels of capital and operating expenditure in the DNSP's revenue allowance, to ensure that financial rewards are not duplicative.

We consider that the most appropriate way to allow DNSPs to propose bespoke incentives is for us to develop a new small-scale incentive scheme (SSIS). A SSIS should provide DNSPs with incentives to provide standard control services in a manner that contributes to the national electricity objective (NEO).[57]

In developing and applying a small-scale incentive scheme for export services, the scheme:[58]

- should reward or penalise DNSPs for improvements or deteriorations in export services
- rewards and penalties should be commensurate with the improvements or deteriorations in export services, but a reward for improvements need not correspond in amount to a penalty for deteriorations in export services
- should deliver benefits to consumers that warrant the rewards provided under the scheme, and the detriments to consumers should warrant penalties provided under the scheme
- should harmonise with other incentives that DNSPs may have under the Rules and the capital expenditure (capex) and operating expenditure (opex) objectives.

A key issue for us to consider in developing and applying an incentive scheme is the power of the incentive, as reflected in the level of revenue at risk (the size of rewards and penalties). Where we apply a SSIS to a DNSP for a regulatory control period, the aggregate rewards or penalties for a regulatory year in that regulatory period that are imposed under that scheme and any other SSISs that apply to that DNSP must not exceed 0.5% of the annual revenue requirement for the DNSP for that regulatory year, unless the DNSP consents to the contrary, in which case the aggregate must not exceed 1% of the annual revenue requirement for the DNSP for that regulatory year.[59]

An alternative option would be for us to amend the existing CSIS. The CSIS (a type of SSIS) is designed to encourage DNSPs to engage with their customers and provide customer service in accordance with their preferences. It is a flexible 'principles based' scheme that can be tailored to the specific preferences and priorities of a DNSP's customers.[60] Therefore, DNSPs have flexibility under the CSIS to design an incentive scheme that considers

[57] NER cl. 6.6.4(a).

[58] NER cl. 6.6.4(b).

[59] NER cl. 6.6.4(d)(1).

[60] AER, *Customer Service Incentive Scheme explanatory statement*, July 2020.

customer preferences and its own network circumstances. However, the level of revenue at risk under the CSIS is currently capped at 0.5%, based on stakeholder feedback received when the scheme was designed. The cap could be increased to 1% to account for customer preferences related to export services, however if the DNSP is already proposing incentives related to consumption services the level of revenue at risk would be lower.[61]

Under both options we are required to comply with the distribution consultation procedures.[62] We intend to commence consultation on the new SSIS for export services when we publish the final report on incentivising and measuring export service performance (currently planned for March 2023).

Aside from the level of rewards and penalties, there would be several issues for us to consider in developing and applying a SSIS for export services and allowing DNSPs to propose bespoke incentives. We agree with the CCP that we would need to ensure that proposed parameters are measurable, reflect customer needs and are efficient. We would also need to consider whether the benefits of such schemes outweigh the costs and contribute to the overall achievement of the NEO. This includes the costs for us to administer and monitor DNSP performance, and for DNSPs to consult with customers and collect and report data on their performance. For example, the CSIS measurement methodology specifies that, for each performance parameter, the proposed measurement is sufficiently independent, in that it is either conducted by an independent third party or based upon and independently developed methodology.[63] Prior to developing a SSIS we should consider whether the costs of measuring performance are material or likely to erode the potential benefits.

For the avoidance of doubt, we consider that any new SSIS (or amended CSIS) may apply for the upcoming 2024-29 electricity distribution revenue determination processes.[64] Although a new or amended scheme would not be finalised prior to the submission of the initial regulatory proposals (due at the end of January 2023), it would be finalised prior to the submission of revised regulatory proposals and so may be included in these (due at the end of December 2023).

Question 3

Do you agree that developing a new small-scale incentive scheme is the best way to facilitate DNSPs proposing bespoke incentives?

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[61] Existing incentives related to consumption services could attract a reward/penalty of 0.5%, and new incentives related to export services could attract a reward/penalty of 0.5%. Alternatively, DNSPs could propose any other combination of rewards/penalties for consumption/export services up to the capped amount.

[62] This means that we must publish the proposed scheme (or proposed amendments to a scheme), an explanatory statement setting out the reasons for the proposed scheme (or proposed amendments to a scheme), and an invitation for written submissions. We must then allow no less than 30 business days for stakeholder submissions, and then publish a final decision on the proposed scheme (or proposed amendments to a scheme) within 80 business days of publishing the abovementioned documents.

[63] AER, *Final Customer Service Incentive Scheme*, July 2020.

[64] For the ACT, NSW, Tasmania and Northern Territory distribution networks.

Question 4

What level of revenue at risk (rewards and penalties) is appropriate for a small-scale incentive scheme for export services?

Question 5

Do you consider that the benefits associated with a small-scale incentive scheme for export services will outweigh the costs of measuring performance and administering the scheme?

Question 6

Are there any other factors we should consider when developing a new small-scale incentive scheme?

3.3.4 Allowance and margin mechanisms

The DMIAM and DMIS are designed to incentivise DNSPs to undertake demand management projects that are efficient and contribute to resolving network constraints. In this way, demand management projects can reduce, delay, or even avoid the need to install, replace or upgrade network assets. Recent changes to the NER confirmed that the DMIAM and DMIS do not apply exclusively to the management of demand for consumption services, and so DNSPs are permitted to propose projects and associated expenditures related to the management of demand for export services (referred to in the scheme objective as 'demand for use of distribution services to supply into a distribution network').[65]

We share PIAC's concern that financial incentives such as the DMIA and DMIS will be duplicative, as improvements to export services may be funded through expenditure allowances and potentially a SSIS. In our guidance for DER integration expenditure, we reinforce that DNSPs should demonstrate that they have considered all credible investment options, including non-network investment options.[66] Furthermore, curtailment of electricity exports represents a form of demand management for export services and is a preferable outcome to investing to increase hosting capacity when the costs of doing so outweigh the benefits.

We also consider that allowing DNSPs to propose bespoke incentive schemes provides them with a sufficient opportunity to demonstrate service improvements. Allowing bespoke incentive schemes *and* increasing the maximum funding allowance under the DMIAM would increase the potential for duplication and greater costs to consumers and increase administrative costs to both DNSPs and the AER in assessing the merits of individual projects. Therefore, we do not see a need to increase the maximum funding allowance under the DMIAM.

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[65] NER cl. 6.6.3.

[66] AER, *Final DER integration expenditure guidance note*, June 2022.

As noted in section 1, this draft report signifies the commencement of consultation on our review of the DMIAM and DMIS. However, based on our draft position, we do not see a need to amend the DMIAM and DMIS at this stage. That is, the DMIAM and DMIS will be available to DNSPs, however the maximum funding allowance will remain unchanged.

Question 7

Do you agree that no amendments to the DMIAM and DMIS are necessary?

3.3.5 Paper trials

Beyond enhancing reputational incentives and allowing DNSPs to propose bespoke incentive schemes, we do not intend to undertake paper trials to test the robustness of potential export service metrics. We agree with SA Power Networks' submission that the learnings observed from transparent reporting against bespoke incentives could inform the design of a standardised incentive over the longer term. We consider that this approach is preferable to us trialling "second-best" export performance metrics, simply because this data is available to us. Further, a comprehensive trial would involve the calculation of rewards and penalties, and these would be difficult to estimate given that CECVs are estimated at 30-minute intervals and may not capture the entire value of exports to the grid.

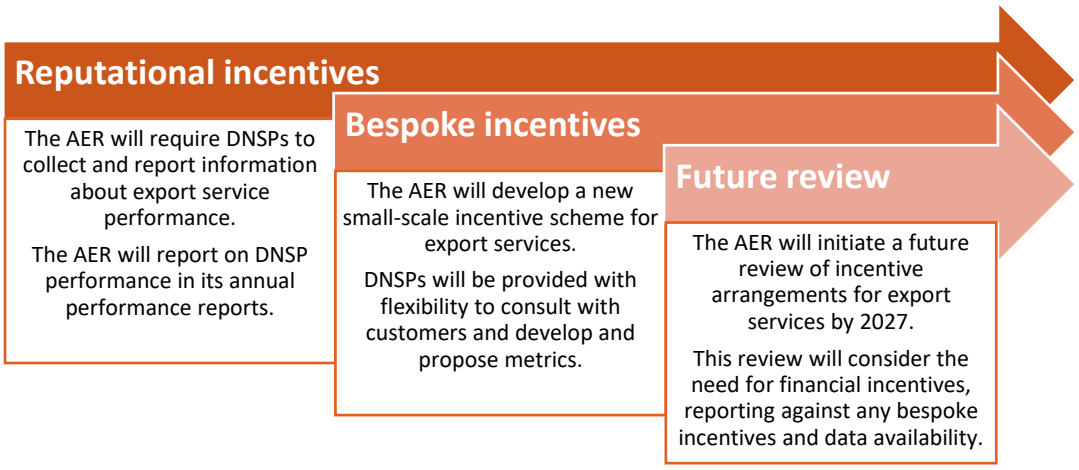
We also recognise that the costs associated with undertaking paper trials could be considerable, particularly if data is not readily available to DNSPs. Further, the benefits of undertaking paper trials at this stage are still largely unknown, noting that key aspects of the export service, such as export tariffs and flexible export limits, are still being developed by DNSPs.

Finally, we consider that our proposed enhancements to reputational incentives (our annual reports on export service performance) will improve our understanding of potential export service performance metrics over time and inform the design of a potential standardised incentive scheme in the future.

We may require a DNSP to participate in a trial of a small-scale incentive scheme under which, for the duration of that trial, the DNSP is not required to bear any penalty and is not entitled to earn any reward.[67] We intend to consult with stakeholders on this possibility when we develop the new small-scale incentive scheme (or alternatively amend the existing customer service incentive scheme).

[67] NER cl. 6.6.4(e).

Figure 2: Approach to incentive arrangements for export services



4 Export service performance reports

4.1 Background

We will publish annual reports on the performance of each DNSP in providing distribution services for embedded generators (such as residential solar) to export into the distribution network. The NER refer to these publications as 'DER network service provider performance reports' (which we refer to as 'export performance reports').[68] These reports will provide transparency for export service customers in understanding the services they are accessing and accountability for DNSPs in the quality of export service they are providing their customers. Our first export performance report will be published by the end of 2023 ('the inaugural report').

As discussed in section 3.3.2, export service performance reports can provide reputational incentives on DNSPs to provide efficient levels of export services. Further, reporting on a DNSP's export service performance, where no revenue is at risk (as there would be in the case of a financial incentive mechanism), may be done using less robust data.

In the consultation paper we sought stakeholder views on:

- the export service performance metrics we should report on in the short term (for the inaugural report) and longer term.
- the feasibility of reporting on involuntary export curtailment experienced by customers, noting the associated measurement challenges.
- the appropriate base year to collect and report data for export service performance metrics.
- the suitability of our suggested potential export service metrics, based on current data limitations and measurement challenges.
- our proposed approach to defining and collecting export service performance metrics, and then preparing the inaugural export performance report as part of the 2023 electricity network performance report.

The following sections set out our draft position on matters relevant to export service performance reports, having regard to stakeholder views. We seek stakeholder views on any of our positions set out in this section, however we are particularly interested in views on the proposed metrics set out in the strawman information request.

4.2 Measuring export service performance in an ideal world

We maintain the view expressed in our consultation paper that we would ideally measure export service performance by measuring involuntary export curtailment per exporting customer due to a network constraint. However, this ideal measure is not feasible to measure in practice, particularly in the short term.

[68] NER rule 6.27A.

This position is consistent with our view that we would ideally measure performance for exports and imports in equivalent ways. Network services are electricity transportation services rather direction-specific services. This position is also consistent with the AEMC's decision to remove references in the NER that are specific to the direction of energy 'so the regulatory framework will give clear guidance that 'distribution services' relate not only to sending energy to consumers, but also to customers exporting the energy they generate'.[69]

We continue to hold the view that key challenges undermine the feasibility of measuring involuntary export curtailment per exporting customer due to network constraints. This metric faces several measurement challenges that render it not currently measurable or cost effective to measure.

Both these views were supported by submissions.[70] Power and Water Corporation (PowerWater) also explicitly agreed with our position that the frequency of involuntary export curtailment should be considered alongside the duration of involuntary export curtailment and a normalisation metric to remove outliers.[71] Ausgrid was the one exception in not supporting the metric as ideal, but this view was on the basis that import and export performance could not be measured in equivalent ways.[72] We agree there are current measurement challenges which would need to be overcome before we decide to report on this measure in the future.

Some stakeholders added that if involuntary export curtailment due to a network constraint became measurable, it should be considered alongside contextual data (such as network or jurisdictional policies)[73] and other metrics to avoid incentivising DNSPs to limit consumer energy resource connections.[74] We agree with these additional views. We also acknowledge that on its own, this metric would give an incomplete picture of service quality as it would not capture curtailment planned through export limits set in connection agreements. It also would not capture certain export-related customer service metrics that DNSPs would have responsibility over, such as connection times for consumer energy resources.[75]

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[69] AEMC, *Rule determination: Access, pricing and incentive arranges for distributed energy resources) Rule 2021*, 12 August 2021, para 9, p. ii.

[70] Supportive submissions included Ergon and Energex, PowerWater, Endeavour Energy, Evoenergy, Public Interest Advocacy Centre (PIAC), AusNet Services and CitiPower, Powercor and United Energy. SA Power Networks considered this measure may be suitable in the long-term in *Submission on incentivising and measuring export service performance*, 29 September 2022, p. 6.

[71] Power and Water Corporation, *Incentivising and measuring export service performance – Consultation paper*, 30 September 2022, p. 9.

[72] Ausgrid, *Submission to the AER's incentivising and measure export services performance consultation paper*, 30 September 2022, p. 4.

[73] AusNet Services, *Incentivising and measuring export service performance – Submission to consultation paper*, 30 September 2022, p. 9.

[74] SA Power Networks, *Submission on incentivising and measuring export service performance*, 29 September 2022, p. 7.

[75] ECA favoured reporting on customer service metrics, including connection times, *Submission to the AER's consultation paper on incentivising and measuring export service performance*, 11 October 2022, p. 4.

4.3 Improving the suite of reported data

Our consultation paper discussed how we might find feasible ways to overcome reporting limitations. Submissions that commented on limitations expressed in the consultation paper agreed or added to the list.[76] The limitations discussed in the consultation paper included the following:

- Limited access to smart meter data outside of Victoria, which limits DNSPs' ability to get observed voltage data at the connection point. AusNet Services agreed that such limitations are different in Victoria given the availability of smart meters.[77] Limitations resulting from low smart meter penetration will diminish as more smart meters are rolled out to consumers – and this is something the AEMC is currently exploring how to accelerate.[78] In the meantime, many DNSPs will need to model this using a sample of voltage levels they can observe. PowerWater recognised this by noting that 16 per cent of its customer base have smart meters and voltage data availability can be estimated to an extent.[79] We agree that current smart meter penetration, along with other voltage estimation methods, are sufficient to allow this data to at least be reasonably estimated at this time. We intend to include this data in our inaugural report.
- Export curtailment cannot be directly observed by networks as it is generated on the customer's side of the meter and its estimation requires modelling customer generation. While inverter data, if acquired, can provide DNSPs better visibility of exports, Evoenergy observed that additional data and analysis would still be required to estimate involuntary export curtailment.[80] We have not identified a way to 'solve' this limitation and we do not intend to collect involuntary export curtailment data for our inaugural report. However, if we collect more modelled data in the future, we consider the negative impact can be mitigated by having common modelling assumptions that allow metrics to be comparable and transparent. In response:
  - several stakeholders commented on the importance of us specifying common definitions and estimation tools to make estimated data relatively accurate and comparable.[81]
  - Ergon Energy and Energex noted the importance of documenting any estimation so we can account for any potential variability.[82]

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[76] AusNet Services, *Incentivising and measuring export service performance – Submission to consultation paper*, September 2022, p. 10; Power and Water Corporation, *Incentivising and measuring export service performance – Consultation paper*, September 2022, p. 10.

[77] AusNet Services, *Incentivising and measuring export service performance – Submission to consultation paper*, September 2022, p. 10.

[78] AEMC, *Review of the regulatory framework for metering services*, accessed 25 October 2022.

[79] PowerWater, *Incentivising and measuring export service performance – Consultation paper*, September 2022, p. 10.

[80] Evoenergy, *Re: Submission to AER's consultation paper on incentivising and measuring export services performance*, September 2022, p. 4.

[81] See submissions from ENA, Ergon Energy & Energex, Endeavour Energy.

[82] Endeavour Energy, *AER consultation paper: Incentivising and measuring export service performance*, September 2022, p. 4.

  - AusNet Services considered estimation and modelling techniques should only be used where robust and necessary and should complement actual auditable data, which should be relied on where possible.[83]

- Various connection agreement processes create difficulties in measuring customer requested versus approved export capacity. For example, many customers have a 5kW static export limit by default and may not have had their preferred export capacity recorded. We will endeavour to improve connection agreement data over time, noting we approve connection policies under NER clause 6.12.1. We still intend to report this measure in our inaugural report as we consider it provides the best indicator available on planned export curtailment. However, we will also contextualise this metric by discussing how data limitations have likely influenced the results.
- Historic expenditure data on export services is of limited use for comparison purposes as it is not universally separately identified. However, we do not intend to use this data to assess comparative performance in our inaugural report, but rather to provide context around activities being undertaken to integrate consumer energy resources. We also expect these data imitations will diminish in future years now that this data will be collected more systematically.
- Limitations in the quality of current data on export customer complaints and overvoltage complaints. It is difficult to resolve legacy data issues, which has informed our review to request DNSPs provide this data only where available for previous years. However, legacy data issues can be resolved if we specify how complaint data should be defined and collected going forward.
- Customer behaviour (such as decisions to self-consume rather than export) influences the delivery of export services. This will cause enduring measurement challenges that can be mitigated by interpreting performance measures with caution, triangulating evidence where possible and specifying common modelling approaches where applicable.

Some stakeholders added other considerations to the data limitations discussed in the consultation paper. Our position is that it is valuable for us to bear these limitations in mind and consider how we can account for them. However, we have little reason to remove or adjust any of the currently proposed metrics without further information on the effect and materiality of these stated limitations, which include:

- AusNet Services noted that customer non-compliance with connection agreements can result in inaccurate estimates of export activity and hosting capacity.[84] This could result in lower estimates of export activity if exports were modelled based on export limits rather than directly measured. We would require further information of the materiality of this non-compliance and a better understanding of how DNSPs are approaching compliance with their own policies.

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[83] AusNet Services, *Incentivising and measuring export service performance – Submission to consultation paper*, 30 September 2022, p. 9.

[84] Ausnet Services, *Incentivising and measuring export service performance – Submission to consultation paper*, 30 September 2022, p. 10.

- AusNet Services observed that customers often have a limited understanding of their appetite and expectations around exports when deciding what size of PV unit to install.[85] The overall effect of this limitation is unclear. For instance, this limitation could lead customers to request more export capacity than they intend to use. However, it could also lead customers to accept a default static export limit when it would be ideal to request more export capacity.
- CitiPower, Powercor and United Energy were unable to guarantee whether all of their data relating to consumer energy resources was accurate as contractors provide them with this physical data.[86] We expect CitiPower, Powercor and United Energy to make prudent decisions when procuring data collection services from contractors, such that any lost accuracy would be immaterial.
- The tendency for residential customers to only request export capacity specified as a standard export limit was raised by Evoenergy.[87] Similarly, SA Power Networks submitted that small customer applications typically get 5kW of export capacity by default rather than being assessed on an individual basis.[88] We consider this would result in underestimates of planned curtailment, which will need to be recognised in our inaugural report. We can build a more complete picture around this dynamic by collecting separate data on customers that request export capacity and what static export limits are applied. Such an understanding is important to build, particularly if default export limits are resulting in unnecessary export curtailment.

A currently open question concerns how DNSPs are resourced to improve their capacity to capture and collect certain data measures. PowerWater mentioned the cost of data acquisition and building system capabilities, and Endeavour Energy mentioned the cost of ensuring data consistency among DNSPs.[89] AusNet Services, Ergon and Energex acknowledged that we need to weigh up the costs and benefits of data procurement.[90]

As DNSPs put forward specific proposals around costs and funding, we will consider this information on its merits. We will need to consider proposals for additional funding within the context that DNSPs are already remunerated for undertaking a range of business activities, which include data collection. The Australian Energy Council noted this when advising us not to provide specific funding to procure or gather data, which can be funded from existing

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[85] AusNet Services, *Incentivising and measuring export service performance – Submission to consultation paper*, 30 September 2022, p. 10.

[86] CitiPower, Powercor and United Energy, *Response to incentivising and measure export service performance consultation paper*, 29 September 2022, p. 6.

[87] Evoenergy, *Re: Submission to AER's consultation paper on incentivising and measuring export services performance*, 30 September 2022, p. 5.

[88] SA Power Networks, *Submission on incentivising and measuring export service performance*, 29 September 2022, p.6.

[89] PowerWater, *Incentivising and measuring export service performance – Consultation paper*, 30 September 2022, p. 10; Endeavour Energy, *AER consultation paper: Incentivising and measuring export service performance*, 30 September 2022, p. 4.

[90] Endeavour Energy, *AER consultation paper: Incentivising and measuring export service performance*, 30 September 2022, p. 3; AusNet Services, *Incentivising and measuring export service performance – Submission to consultation paper*, 30 September 2022, p. 10.

capital expenditure (capex) budgets and revenue from export tariffs should fund visibility.[91] While additional data requirements may put pressure on existing budgets, this will need to be considered along other factors, such as if the AER has eased data requirements in other areas.[92]

CitiPower, Powercor and United Energy suggested we minimise reporting duplication by using publicly available data.[93] We agree with this approach where publicly available data is relevant and sufficiently reliable. We have therefore endeavoured to minimise reporting costs where possible by collecting data that is already reported (for example, data provided to AEMO for its DER register). We will continue to engage with stakeholders to find other opportunities to leverage off data that is already available.

Question 8

Is there any data we are missing that should be included in our key metrics?

Question 9

Do you foresee any challenges in collecting the new data for the key metrics? Can you identify any additional costs associated with data collection?

4.4 Content to include in the inaugural report

When consulting on what content to include in the inaugural report, we sought stakeholder views on the following:

- The breadth of content
- The base year for reporting purposes

The specific contextual and performance metrics we have considered for inclusion in the inaugural report are summarised in **Attachment B**, along with stakeholder views and our draft position. The specific metrics for inclusion in the inaugural report are set out in a strawman information request published alongside this draft report.

4.4.1 Breadth of content

We propose to include a combination of performance and contextual measures in the inaugural report. These are discussed in **Attachment B** and include the following:

- Export customer numbers
- Installed capacity
- Customers with compliant inverters

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[91] Australian Energy Council, *Incentivising and measuring export services performance*, 2 September 2022, p. 1.

[92] For example, the AER is currently consulting on streamlining its reporting requirements under its *Networks information requirements review*, accessed 31 October 2022.

[93] CitiPower, Powercor & United Energy, *Submission on incentivising and measuring export service performance consultation paper*, September 2022, p. 6.

- Customers receiving overvoltage
- Estimated capex and opex for the primary purpose of consumer energy resource integration by reason
- Customer complaints relating to export services, complemented by complaints relating to overvoltage
- Net metered volume of energy exported
- Total utilised consumer energy resources generation
- Approved to requested export capacity, complemented by export customers provided with export limit below requested
- Approved export capacity to installed capacity
- Percentage of export customers with (a) static zero export limits, (b) non-zero static export limits, (c) dynamic/flexible export limits, including information on the magnitude of those limits.
- Duration customers experience uncurtailed access up to their set limit
- Duration of no export access
- Connection time for consumer energy resources

Submissions supported the approach of using a combination of contextual and performance measures for the following reasons:

- SA Power Networks considered a combination of measures would recognise that different measures have different use cases.[94]
- Ausgrid and Endeavour Energy submitted that since we must currently rely on imperfect data, reporting a combination of measures would mitigate against perverse outcomes. For example, focusing on export-based measures would not appropriately capture self-consumption.[95] PowerWater provided a similar view, suggesting we could complement partial performance indicators with a qualitive assessment of DNSP's approaches to export-related planning and investment.[96]
- Several stakeholders supported publishing contextual data to understand whether or how operating factors influence exports and export capacity as this information will often affect our ability to compare performance.[97]

We also intend to complement our analysis in the inaugural report with qualitative analysis for added context and nuance. We will consult on the specifics around this qualitative

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[94] SA Power Networks, *Submission on incentivising and measuring export service performance*, 29 September 2022, p. 2.

[95] Ausgrid, *Submission to the AER's incentivising and measure export services performance consultation paper*, 30 September 2022, p. 4; Endeavour Energy, *AER consultation paper: Incentivising and measuring export service performance*, 30 September 2022, pp. 3–4.

[96] PowerWater, *Incentivising and measuring export service performance – Consultation paper*, 30 September 2022, p. 2.

[97] See submissions from ENA, CitiPower, Powercor & United Energy, Endeavour Energy and Ausnet Services.

analysis as we develop our inaugural report as part of our electricity network performance report in 2023.

4.4.2 Base year

While export performance reports must cover a 12-month period,[98] we expect each report would compare that 12-month period against a longer time series to analyse changes over time. We also appreciate that acceptably reliable data relating to export service only became available in recent years, and that we must balance the value of having a longer time series against the value of performing comparative analysis with higher-quality data.

We continue to hold our view in the consultation paper that 2020-21 would be a reasonable base year for most data relating to export service performance. We have also since proposed to collect additional measures from 2022-23 that are less likely to be available earlier. These additional measures are included in sheet 11.0 of the strawman information request and include 'duration of full export access', 'duration of no export access' and 'total utilised consumer energy resources generated'.

We understand that most of the data we are seeking to collect from 2020-21 (summarised in **Attachment B** and the strawman information request) is available. To the extent that some measures are unavailable for some DNSPs in 2020-21, we will use the information request to signal future data requirements and will accept an 'N/A' response in the meantime.

In response to the suggested base year in the consultation paper, stakeholders expressed a range of views:

- Ergon and Energex supported using 2020-21 as the base year for most export performance metrics.[99]
- PowerWater considered it possible to use 2020-21 as a base year, but also noted that some of the data we had proposed to collect would not be available.[100] In light of this submission, we are proposing to specify that DNSPs provide data only where available for specific fields.
- AusNet Services does not support using 2020-21 as a base year due to COVID-19 effects, where it had a limited ability to service its increased demand for PV installations. AusNet Services advised that if this data is used, it should be contextualised.[101] We previously analysed the effects of COVID-19 on Victorian DNSPs and found this had a limited impact on DNSP revenues, expenditures and returns – notwithstanding there was a material shift from business to residential consumption.[102] We therefore do not have material concerns with using this data more broadly. The reasoning provided in

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[98] AEMC, Rule determination: National Electricity and Energy Retail amendment (access, pricing and incentive arranges for distributed energy resources) Rule 2021, 12 August 2021, p. 48, NER 6.27A.

[99] Ergon Energy and Energex, *AER consultation – Incentivising and measuring export service performance*, 30 September 2022, p. 6.

[100] PowerWater, *Incentivising and measuring export service performance – Consultation paper*, 30 September 2022, p. 9.

[101] Consumer Challenge Panel, *Incentivising and measuring export service performance for distributed energy responses: Response to the AER consultation paper*, October 2022, p. 14.

[102] AER, *Electricity network performance report*, September 2021, p. 31–45.

AusNet Services' submission implies COVID-19 would have had a material and negative impact on PV installation times. AusNet Services' point is therefore relevant as we are proposing to report this measure following ECA's submission to our consultation paper.[103] However, we consider this data still valuable and intend to contextualise 2020-21 measures of installation times in context of COVID-19.

- SA Power Networks noted the performance metrics must be agreed on first with consideration to data availability before the base year can be determined.[104] We agree that several performance metrics, particularly those supported by SA Power Networks, will not be available in 2020-21 for most DNSPs. However, we do not consider it harmful to have different data series start in different years to balance the benefits of having a longer timeseries as well as more reliable data. As such, our draft position is to collect data for a base set of metrics from 2020-21 where it is available, and to collect data for other relevant metrics as it becomes available.
- The CCP preferred to start with the current round of regulatory proposals (forecast curtailment for 2023). However, that base year may be more appropriate for a potential incentive scheme rather than the inaugural report in 2023.

Question 10

Do you agree with the proposed base year for 2020-21 for most metrics and 2022-23 for metrics where data may be less available? Please suggest an achievable timeframe for metrics where the proposed reporting date is not feasible.

Question 11

Do you agree with the level of data disaggregation in the strawman information request (typically disaggregated by customer type and feeder classification, with some exceptions)? Please provide your views and reasons if you consider specific data should be disaggregated at a different level to that proposed.

Question 12

Is any of the proposed data ambiguous? If the information request would benefit from additional definitions or specification, please provide your suggestions.

4.5 Steps for developing the inaugural report

Our position is to broadly maintain the steps for developing our inaugural report as proposed in the consultation paper. Any revisions include steps to accommodate the revised timelines

[103] AusNet Services, *Incentivising and measuring export service performance – Submission to consultation paper*, 30 September 2022, p. 10; ECA, Submission to the AER's consultation paper on incentivising and measuring export service performance, 11 October 2022, p. 4.

[104] SA Power Networks, *Submission on incentivising and measuring export service performance*, 29 September 2022, p. 6.

for this review and stakeholder requests for further consultation on data requirements. Specifically, we propose to:

- as part of the broader stakeholder workshop on the draft report on 6 December 2022, hold a session to discuss the strawman information request in **Attachment B** of this report. This recognises that some stakeholders:
  - supported further engagement or workshops on an initial set of export service metrics and estimation methods that could be cost-effectively measured.[105]
  - requested further consultation on new performance measures that were suggested by other stakeholders in response to the consultation paper. Specifically, SA Power Networks suggested including performance measures identified through RACE for 2030 work,[106] which AusNet Services considered should be open for further consultation to test customer appetite and network-specific challenges for such reporting.[107]
- issue an information request to collect 2020-21 and 2021-22 data around early 2023 rather than shortly after the release of this draft report.
- maintain our proposal to incorporate the inaugural report into our 2023 electricity network performance report. Several stakeholders explicitly supported this approach, and none raised concerns.[108]
- rather than releasing the inaugural report early (mid-2023), use the entire time available to release it as a version update of the 2023 electricity network performance report in December 2023. This aligns with submissions that either preferred a December 2023 release[109] or supported whichever approach would produce the best results.[110] In doing this, we propose to:
  - use the data received from the information request in early 2023 and other relevant information we have available to develop an export service performance chapter as a focus area. This chapter will form the shell for the inaugural report, although it will not incorporate the full dataset.

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[105] Endeavour Energy, *AER consultation paper: Incentivising and measuring export service performance*, 30 September 2022, p. 4; AusNet Services, *Incentivising and measuring export service performance – Submission to consultation paper*, 30 September 2022, p. 10.

[106] SA Power Networks, *Submission on incentivising and measuring export service performance*, 29 September 2022, p. 6. See the project, Race for 2030, *Measuring and communicating network export service quality*, accessed 25 October 2022.

[107] Ausnet Services, *Incentivising and measuring export service performance – Submission to consultation paper*, 30 September 2022, p. 9.

[108] See for example, Ergon Energy & Energex, *AER consultation – Incentivising and measuring export service performance*, 30 September 2022, p. 1.

[109] Ausgrid preferred a December release to avoid overlapping with their regulatory proposal – see *Submission to the AER's incentivising and measure export services performance consultation paper*, 30 September 2022, p. 5. PowerWater preferred a December release to have more comprehensive data – see *Incentivising and measuring export service performance – Consultation paper*, 30 September 2022, p. 11.

[110] CitiPower, Powercor & United Energy, *Submission on incentivising and measuring export service performance consultation paper,* September 2022, p.7; Ergon Energy & Energex, *AER consultation – Incentivising and measuring export service performance*, 30 September 2022, p. 7.

- issue an information request before the 2022-23 year's end to collect data for that year. Responses will be due in September 2023.
- use 2022-23 data collected in September to develop the inaugural report as a comprehensive chapter under version 2.0 of the 2023 electricity network performance report.

5 Update to benchmarking reports

5.1 Background

To the extent export services are not appropriately captured in our productivity benchmarking, some DNSPs may receive lower productivity scores than would be the case if export services were better reflected in the benchmarking models. This is because while inputs such as opex increase, the outputs associated with export services may not be recognised. Where there are material impacts on the models' productivity results, this could lead to perverse reputational incentives for DNSPs around providing export services and affect how we assess the efficiency of their opex as part of the revenue determination process.

In the consultation paper we considered whether changes to our productivity benchmarking were necessary and sought stakeholder views on:

- the extent to which existing benchmarking model inputs and outputs account for, and / or do not account for export services, and the materiality of any impact this has on the productivity results
- the range of options we could consider for adjusting the benchmarking framework to account for export services, and the data requirements and implementation obstacles for each of these options
- our proposed two-staged approach for considering options to change the benchmarking framework, which included:
  - first, developing an export services OEF as an interim way to account for export service costs in the benchmarking while also establishing the type and materiality of any impacts on the benchmarking results from the provision of export services and possible options for addressing these impacts through changes to the benchmarking model specifications.
  - then, in 2023-24, subject to fully establishing the nature and materiality of any problems, undertaking an 'implementation' review of the benchmarking models to determine if and how the model specifications could be updated to address these impacts.

5.2 Stakeholder views

This section outlines stakeholder submissions to the consultation paper in relation to the impact of export services on the benchmarking models. These covered the following three key areas: defining the problem with the benchmarking models not incorporating export services, options for adjusting the benchmarking models and challenges to doing this. We have summarised stakeholders' views in relation to these key areas below. We found these submissions useful at a high level, but note we received limited feedback at the more detailed level, and that a key theme throughout the submissions was that further work is required in considering the relevant inputs, outputs and associated data that will be required to inform any changes in the future.

5.2.1 Defining the problem with the existing benchmarking models

Stakeholders agreed that the current benchmarking models did not fully account for export services

Most DNSPs submitted that there is a problem with the way the current benchmarking models account for export services. At a high level this was described as the models accounting for export service inputs, but not outputs, meaning distribution networks that provide higher levels of export service outputs would be disadvantaged to some degree through relatively lower productivity scores.[111]

SA Power Networks noted that its productivity scores are underestimated under current model specifications as the costs it incurs to provide export services adds to their benchmarking inputs while the export services provided are not recognised as a separate output in the benchmarking models nor accurately captured in the existing energy throughput output.[112] SA Power Networks stated that using the current benchmarking results to forecast opex growth under the AER's base-step-trend approach also under-estimates its costs of service provision and provides a disincentive to provide additional export services.[113]

Ausgrid noted that the current benchmarking techniques do not account for export services as none of the existing outputs takes into account exported energy flows, which is a key measure of how much exported energy is being facilitated.[114]

Ergon Energy and Energex and AusNet Services expressed the view that this type of impact on productivity results is likely to increase over time as demand for export service increases.[115]

The materiality of any current impacts on the benchmarking results was not established with calls for better data and further research to better understand the size of any impacts ahead of a full review

Submissions, in general, did not make the case that the benchmarking models and productivity scores are currently being materially impacted by the provision of export services, although some noted that the size of any impacts is likely to increase over time as the level of export services increases. In this regard, there was no quantitative analysis presented in terms of the impacts of export services or their materiality.

Ergon Energy and Energex stated that while the existing benchmarking models do not adequately cater for export services, the current impact on the productivity scores is likely to

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111 SA Power Networks, Ausgrid, Ergon Energy & Energex, CitiPower, Powercor & United Energy, Endeavour Energy, AusNet Services, PowerWater, TasNetworks submissions.

112 SA Power Networks, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

113 SA Power Networks, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

114 Ausgrid, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

115 Ergon Energy & Energex, AusNet Services submissions.

be immaterial. It added that there is potential for this to change over time as demand for export services increases.

PowerWater noted that historically, it has 'spent negligible capital on export specific programs, instead relying on the inherent capability of the network to facilitate exports for our customers'.[116]

Other DNSPs, without commenting on the current level of materiality of any impacts on the benchmarking models, noted that any impacts are likely to increase over time. TasNetworks stated that changes to benchmarking would be required in the future as export services increase but urged caution in attempting to make any changes in the short term.[117] AusNet Services noted that it expects export service expenditures to become more material over time as the number of customers demanding export services increases.[118]

A number of DNSPs emphasised the need for further research into materiality to inform options for changing the current models. SA Power Networks proposed that the AER should undertake a materiality assessment of the impact of export services on the benchmarking results 'as a first and urgent step',[119] while CitiPower, Powercor and United Energy supported further analysis by the AER to better understand materiality prior to implementing any model updates. Jemena supported the collection of more data to allow us to better understand the materiality of export service cost drivers with a focus on understanding changes over time for DNSPs rather than to inform relative comparisons.[120] AusNet Services noted that it is difficult to form a view on the impact on productivity results and the materiality without sufficient information and analysis and recommended that the AER undertake (as part of a holistic review) further analysis to assess what output measures are the best fit for the benchmarking model.[121] Evoenergy, without commenting on the current level of materiality directly, noted that better data and more work is required to ensure any changes to models are fit for purpose before they are made and used to generate updated scores.[122]

5.2.2 Options for adjusting the benchmarking framework to account for export services

DNSPs did not support development of an interim OEF

Submissions did not support developing an export services OEF as an interim approach to account for export services in the benchmarking framework, with several distribution

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[116] PowerWater, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[117] TasNetworks, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[118] AusNet Services, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[119] CitiPower, Powercor & United Energy, SA Power Networks submissions.

[120] Jemena, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[121] AusNet Services, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[122] Evoenergy, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

networks noting that the opex data required is not available or is not sufficiently comparable or reliable.

Jemena stated that it cannot report export services opex because historically this type of data has not been separately defined and recorded in its internal systems or required by the AER in its reporting framework.[123] Jemena noted for similar reasons, that it is unclear whether export services opex can be consistently reported across all DNSPs to enable meaningful comparisons. CitiPower, Powercor and United Energy stated that the historical opex needed to calculate an OEF is not likely to be available from all networks, will only be available for more recent years and may not be reported on the same basis.[124] AusNet Services noted that errors in the opex data could be amplified by the use of unaudited historical expenditure.[125]

Some submissions highlighted that an export services OEF would be a partial adjustment that would not consider wider issues. Ausgrid and Evoenergy noted that while an OEF aims to adjust for materially higher export service costs incurred by a network when comparing the business's performance to that of the 'comparator group' of efficient network businesses, it does not account for potential export service impacts in determining the comparator group itself.[126] Energy Queensland noted the potential for opex-capex trade-offs in providing export services and that this could result in an export services OEF, which would be based on opex costs only, being calculated using non-comparable cost data.[127] CitiPower, Powercor and United Energy highlighted that an OEF would be a less accurate approach to factoring export services into the benchmarking framework than updating the model specifications, which can better account for interrelationships between network inputs and outputs.[128]

Other reasons raised against the development of an interim OEF included:

- the approach may not be appropriate where expenditure has been historically small but is increasing[129]
- export services costs may not be fully exogenous (a required criteria under the AER's OEF framework) as networks may have some control over the level of export services costs provided[130]

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[123] Jemena, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[124] CitiPower, Powercor & United Energy, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[125] AusNet Services, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[126] Evoenergy, Ausgrid submissions.

[127] Ergon Energy & Energex, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[128] CitiPower, Powercor & United Energy, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[129] AusNet Services, Evoenergy submissions.

[130] Evoenergy, Ausgrid and AusNet Services submissions.

- OEFs do not change the AER's headline multilateral total factor productivity (MTFP) and opex partial factor productivity (PFP) productivity results, which stakeholders such as customer advocates and investors place significant weight on.[131]

Two distribution networks offered qualified support for developing an export services OEF. Power and Water supported its development in principle,[132] while SA Power Networks supported future consideration of an OEF, but only after a full review of options for amending the benchmarking model specifications.[133]

There was strong stakeholder support for further work on possible options to update model specifications but with varying degrees of urgency and some caution urged

Submissions included widespread support for further consultation on updating the benchmarking model specifications and called for, with varying degrees of urgency, a full review of how to account for export services in the benchmarking models.

SA Power Networks stated that, following urgent work to first assess the materiality of the impact of export service enablement on benchmarking outcomes, the AER should undertake a 'fulsome and holistic' review of the benchmarking models that included consideration of:

- potential metrics for a new export service output that could include 'CER energy kW' as a shorter-term proxy and 'total utilised Customer Energy Resource (CER) generation' in the longer-term
- the continued relevance of existing metrics including energy throughput and ratcheted maximum demand and whether energy that is self-consumed and energy exported to the transmission network should be added back in
- the interrelationships between export services and other benchmarking variables
- the suitability of existing benchmarking models to accommodate export services.[134]

CitiPower, Powercor and United Energy proposed that, following work to first understand the materiality of the impacts of export services on benchmarking outcomes, 'the AER begin consultation to develop holistic adjustments to the benchmarking models', noting that any review should consider interrelationships between export services and other benchmarking variables, adjust the models where necessary and consider developing export service cost category partial productivity indicators.[135]

Jemena highlighted that a lack of consistent and reliable time series export services data means the AER's benchmarking models cannot be reviewed and updated at this stage.

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[131] AusNet Services, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[132] PowerWater, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[133] SA Power Networks, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[134] SA Power Networks, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[135] CitiPower, Powercor & United Energy, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

Jemena recommended a focus on collecting adequate data to understand the materiality of export service cost drivers and to revisit further consultation on updating models once export services have matured and DNSPs have collected an appropriate time series of data.[136]

Energy Queensland supported the AER's proposed stage two approach to reviewing the benchmarking models and noted that 'a considered assessment of any complex changes over the longer-term is required'. Energy Queensland agreed in principle with the possible options identified by the AER for adjusting the benchmarking framework to better account for export services and noted that a specific measure that identified customers with export services should also be considered as part of any review.[137]

Ausgrid also supported the two-stage review of model specifications as we described in the consultation paper (but not the development of an OEF in the first stage), noting that any review should consider either adding one or more new output variables to the existing model specifications to better reflect the export services being provided by DNSPs, or alternatively, excluding export services costs from the benchmarking models. Ausgrid noted that this second approach would ensure that only costs contributing to the existing model outputs are accounted for in the benchmarking results, and that export services opex could be 'benchmarked or efficiency-tested separately' through partial productivity indicators or other benchmarking analysis.

Ausnet Services, Endeavour Energy and Evoenergy also supported the option of excluding or 'carving out' exports services costs from the existing benchmarking models. Evoenergy noted this approach could be an alternative to incorporating export services into the existing benchmarking models noting that reliable data required to do this, particularly the international data needed for the econometric models, may not be available.[138] AusNet Services and Endeavour Energy both stated that carving-out export service costs from the existing models would avoid DNSPs with materially higher levels of export service inputs and outputs from being disadvantaged under current model specifications. Endeavour Energy noted that a significant obstacle to this approach would be accessing robust estimates of DNSPs historical costs.[139] AusNet Services stated that exports services opex and capex would need to be captured and that the AER would need to consult and provide guidance on how to collect and report export services-related costs to ensure the data is comparable between businesses.[140]

Offering a contrasting view, CitiPower, Powercor and United Energy did not support the option of removing export service inputs (or outputs) from the benchmarking model specification stating that the approach would remove 'any ability for the benchmarking

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[136] Jemena, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[137] Ergon Energy & Energex, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[138] Evoenergy, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[139] Endeavour Energy, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[140] AusNet Services, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

models to assess the efficiency of export service delivery and would reduce the accuracy of network benchmarking overall'.[141]

AusNet Services supported a broader review of benchmarking model specifications that considers exports service issues as part of a wider, holistic review of the current benchmarking models, partial productivity indicators and OEFs. It noted that the export services component to this review should assess the need for a new export service output and or new export service input provided they are relevant and statistically significant and weighted appropriately. More specifically, that the AER assess the appropriateness of capturing self-consumption in the output measures (energy delivered and ratcheted maximum demand, and reliability) acknowledging it would require estimation techniques or purchasing data from inverter aggregators/manufacturers.[142]

The CCP supported a full review of model specification with a focus on how network utilisation is measured noting that networks should be incentivised to improve the utilisation of their assets as growth in energy exports drives falling energy loads.[143] The CCP suggested the review should consider a new definition of the energy throughput output to ensure it reflects two-way energy flows.

5.2.3 Obstacles to fuller future review and implementation

Accessing comparable expenditure data is an obstacle to developing an OEF and updating model specifications more generally – the costs of data collection were also raised

Submissions raised concerns about how robust and consistent expenditure data can be reported. AusNet Services noted that its systems, and likely that of other DNSPs', are not designed to disaggregate import and export expenditure and that attempting to do so is complicated by the fact that much of the expenditure delivers both import and export services.[144] The CCP noted that it would be very difficult to remove costs exclusively related to export services as most export service-related investment and opex also has a close relationship to capacity and load capability.[145]

Jemena and Endeavour Energy stated that the export service expenditure sought in the consultation paper has not been explicitly defined and that, to date, it has not been separately captured in their internal systems. As a result, Jemena noted it is not possible to provide this data to the AER, and it is unclear that this data could be consistently reported across all DNSPs to enable robust or meaningful comparisons.[146]

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[141] CitiPower, Powercor & United Energy, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[142] AusNet Services, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[143] Consumer Challenge Panel, *Submission on incentivising and measuring export service performance consultation paper*, October 2022.

[144] Ausgrid, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[145] Consumer Challenge Panel, *Submission on incentivising and measuring export service performance consultation paper*, October 2022.

[146] Jemena and Endeavour Energy submissions.

Some DNSPs supported further consultation on export services expenditure data collection and asked for AER guidance on any data required to review and update the benchmarking models. Ausgrid emphasised that the AER should consult with DNSPs on how export services-related costs should be defined and reported, and then publish clear guidelines to ensure the data is comparable. Similarly, AusNet Services noted it would be useful 'to get guidance around what constitutes exports-related expenditure and if related costs such as overheads can be classified as exports related and if so, how would the quantum be determined.'

AusNet Services also highlighted the potential costs and regulatory burden associated with updating its internal processes and data reporting systems and stated that the AER should investigate and consult widely on data requirements for reviewing and updating the benchmarking models before imposing any new data reporting requirements on networks. Concern for potential costs was also expressed by the CCP and PowerWater, with PowerWater noting that it does not capture this data and would need to investigate the most efficient method and system to do so and that any new reporting requirements should be targeted and proportionate to the benefits they would provide.[147]

Lack of reliable and comparable time series and international data more generally is a major obstacle to implementing model specification changes

Many DNSPs emphasised a need for caution and further work due to lack of availability of reliable and comparable export services-related data (beyond expenditures). DNSPs considered this a significant obstacle to updating the benchmarking models, particularly the time series data back to 2006 needed to update the productivity index number and econometric models, and the international data required for the econometric models.

Jemena noted that the data required to review and update the model specifications for exports services (i.e., historical time series data that is consistent across Australian and international DNSPs) is not currently being collected or reported. Jemena recommended that the AER first begin to collect adequate data to understand the materiality of export service cost drivers, then consult on updating the benchmarking models once export services have matured and DNSPs have collected needed time series of data.[148] TasNetworks urged caution in attempting to develop new approaches to benchmarking in the short term, advising that the AER should monitor developments and wait for international data to mature before making changes to existing benchmarking techniques.[149] Evoenergy likewise expressed concern around the availability of time series data noting that we have just begun to incorporate export services into the regulatory framework and that accurate and robust data, particularly for 'low network visibility' networks is likely not available. Evoenergy highlighted potential limitations with incorporating immature or inappropriate data into the

[147] PowerWater and Consumer Challenge Panel submissions.

[148] Jemena, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[149] TasNetworks, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

econometric models, especially data for international DNSPs that are subject to 'a different policy environment with different consumer preferences'.[150]

Endeavour Energy also expressed a need for caution noting that it is not clear how the AER's modelling specifications could be updated with appropriate export data from comparable overseas distributors given in their view it is unlikely that quality international data could be easily accessed.[151]

SA Power Networks also highlighted potential complexities from the use of international data, noting it may be difficult to find suitably comparable data on export service provision from the international DNSPs given that Australia is at the forefront of global change toward distributed energy.[152] Ausgrid noted it may not be practical to respecify the existing econometric models to account for export services because of their reliance on international data. Ausgrid noted that it would be important to ensure that any data required to update variables was reported in a consistent way by the New Zealand and Ontarian DNSPs, and that the AER may need to consider whether it is appropriate to continue the use of New Zealand and Ontarian DNSP data within its econometric opex benchmarking models.[153]

AusNet Services recognised that re-specifying all the benchmarking models would be a difficult task in that it would require 'data collection over a period of time, across a number of businesses including international networks'.[154]

5.3 Draft position

This section outlines our draft position in terms of the impact of export services on our benchmarking model and our views on:

- the development of an OEF as an interim measure to account for export service costs in the benchmarking framework.
- possible impacts export services may be having on the productivity results, and options for addressing these impacts and assessing the materiality the changes may have on the benchmarking results.
- our revised approach for determining if / how the benchmarking models can be adjusted to better account for export services.

We are now seeking stakeholder's views on the following positions we have taken in relation to these issues, including:

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[150] Evoenergy, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[151] Endeavour Energy, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[152] SA Power Networks, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[153] Ausgrid, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[154] AusNet Services, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

- not proceeding with developing an export services OEF at this time given there was no real support for this and there is insufficient data available to enable its development.
- focusing in the future on understanding the materiality of the impact of export services on our benchmarking results and how the benchmarking models may need to be modified in the future, with an initial focus on the Productivity Index Number (PIN) models.
- informing these considerations via data collection.
- initiating a full review of the benchmarking models by 2027 to determine the materiality of export service impacts on the productivity results, the types of model adjustments need to account for these impacts, and the feasibility of successfully implementing the adjustments changes.

5.3.1 An export services OEF cannot be developed at this time

Our draft position is to not proceed with the development of an interim export services OEF at this time as there is insufficient reliable data available to do so.

As noted in section 5.2, submissions generally did not support the development of an OEF with several DNSPs and the CCP highlighting that the expenditure data needed to calculate one is not currently available and not sufficiently comparable or reliable to be useful.[155] Given the joint nature of costs incurred for export and distribution services, the export services-related costs may not be separable from other costs and are not separately collected by the DNSPs. We agree with these views.

We note that our preliminary analysis of the incomplete and estimated export services expenditure data provided by distribution businesses in information responses over 2021-22 indicates that it is unlikely that an OEF would have been sufficiently material at this time to meet our criteria for use in our base opex assessment process.[156]

We are proposing in section 5.3.3, to consult on the types of export services data we will begin to collect to inform further work on whether there is a material issue with the benchmarking models and if and how the models might need to be updated for export services. As part of this, we propose to begin collecting export services opex and capex data as set out in section 5.3.3, Box 1. After consulting with stakeholders on this draft report, we will provide (in the final report) a list of the export services data we will seek to collect, including definitions and guidance to improve comparability across DNSPs. We note there will be some overlap with the data needed for the benchmarking review work and what is required for export service performance reporting, as set out in section 4 and in the straw man information request provided with this draft report.

As the time series of export services expenditure data matures, we leave open the option of developing an export services OEF in the future, particularly if the work outlined in section 5.3.3 concludes that updates to the benchmarking model specifications to incorporate export services are not feasible.

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[155] CitiPower, Powercor & United Energy, Jemena, AusNet Services, Evoenergy, Ergon Energy & Energex submissions.

[156] The OEF materiality criteria typically requires typically that an OEF is material enough to applied in the base opex assessment process where a DNSP's OEF-related period average opex is greater than 0.5 per cent of total opex. See criteria for identifying OEFs in AER, *Annual benchmarking report: Electricity DNSPs*, November 2021, p. 46.

Question 13

Do you agree that we should not proceed with developing an export services OEF at this time?

5.3.2 Draft views on possible impacts of export services on the benchmarking models and options to address and assess these impacts

We have considered stakeholders' feedback on the issues raised in the consultation paper and updated our assessment of the possible impacts export services could be having on the benchmarking models, the possible materiality of these impacts and future options to address these impacts. Table 2 summarises our draft views on:

- potential impacts of export services on the benchmarking models
- possible options for addressing these impacts and an early 'indicative' view of the materiality of the impact, as gauged by possible changes to the models and the impact this may have to the productivity results
- options for more fully testing materiality when better data is available
- key issues that would need to be resolved before any changes to the models could be implemented, including how the conceptual merits of any change could be established, the types of data and assessments needed, and the criteria for making a final assessment to proceed to implement a change or not.

The draft views provided in Table 2 are refinements to those outlined in the consultation paper. We note that as there is limited data or information available on export services at present, the views in column two '*Possible options for change / materiality checks'* are a next step in the process of seeking to determine the impact of export services on benchmarking. In particular, the draft views on materiality are informed by the limited opex and capex data we have (noting the concerns expressed in submissions in relation to this), and our current understanding of, and judgement around, possible export service impacts.

Question 14

Do you agree with our draft views summarised in Table 2, including on:

- the potential impacts of export services on the benchmarking models?
- the possible options for addressing these impacts?
- the early 'indicative' views of the materiality of changes to the productivity results of implementing these options?
- key issues that would need to be resolved before changes to the models could be implemented?

In providing your comments on each issue, please include any rationales and evidence in support of your views.

Table 2: Summary of our draft views on possible export service impacts on the benchmarking results, options for adjusting the models and the materiality of the likely impacts on the productivity results, and implementation issues to resolve

Possible impacts of export services	Possible option for change / materiality check	Implementation issues to resolve
To the extent the *benchmarking models appropriately account for exports services inputs but not outputs* DNSPs with materially higher levels of export service inputs can be disadvantaged by relatively lower productivity results compared to DNSPs with lower levels of export service inputs.	**Possible option**: Remove export service opex costs and capital stock inputs from the benchmarking models.[157] **Draft view on materiality of impact on productivity results**: the impact of removing opex costs input is likely to be small, as currently available export service opex cost data indicates it is a small proportion of total opex costs for those DNSPs that have provided data. It is also not clear if / how export services has impact capital stock inputs (see below). **Materiality check:** Materiality could be checked by accessing Australian data on export service opex and capital stock inputs by DNSPs per year and if possible, removing these inputs from the existing input data to determine the impact on the PIN model productivity results.	The suggested approach of identifying and removing a specific set of inputs from the models cannot account for the interrelated impacts export service expenditures (and the impact of capital stock) are likely to have on the outputs that would remain in the models. The productivity scores generated from this type of change would likely be less holistic and less accurate. In addition, it is not clear how feasible it would be given, for example, export service opex and capital investments may have more than one driver making it difficult to disaggregate or allocate costs / capital stock. See section 5.3.3 below for further details. Access to comparable and reliable annual export services opex cost data by DNSP would be needed from 2006 to present for Australian DNSPs (noting this could also be needed for international DNSPs if the application was extended from the PIN models to the econometric opex cost function models). From submissions to date, we understand this will be challenging.

[157] Ausgrid, AusNet Services, Endeavour Energy and Evoenergy submissions supported this approach as an alternative to updating the model specifications for export services with Evoenergy highlighting that the reliable data required to do a model specification update, particularly international data needed for the econometric models, may not be available. Ausgrid noted that under this approach export services opex could be 'benchmarked or efficiency-tested separately' separately through Partial Productivity Indicators or other benchmarking analysis. This approach was opposed by CitiPower, Powercor & United Energy who stated that that the approach would remove 'any ability for the benchmarking models to assess the efficiency of export service delivery and would reduce the accuracy of network benchmarking overall.

Possible impacts of export services	Possible option for change / materiality check	Implementation issues to resolve
		Establish which, if any, capital stock inputs may be impacted by export services and whether there is disaggregated, comparable and reliable annual data from 2006 to present for Australian DNSPs. **Final assessment to take account of:** Decision to implement in the future should be based on the conceptual merits of this option, the availability of robust data, implementation costs, and the materiality of the change.
The *Energy Throughput (ETP)* output is currently measured at the customer meter and is intended to measure the amount of energy transported to customers over the distribution network. ETP counts energy exported by small scale solar PV generators into the distribution network when it is consumed by other households (as it is energy transported to customers over the distribution network) meaning the quantity of energy exported into distribution networks is already accounted for in the benchmarking results. However, an increase in energy generated by households and self-consumed could, all else	**Possible option**: Modify the definition of the existing ETP output to account for the impact of exports services (potentially less ETP) by adding the amount of energy self-consumed to create a measure that accounts for the level of underlying energy demand met rather the amount of energy actually transported to customers over the distribution network.[158] **Draft view on materiality of impact on productivity results**: the impact of adding energy self-consumed to ETP is likely to be small as the annual level of energy self-consumed by small scale solar PV generators is likely a small proportion of total energy delivered. **Materiality check:** If a case can be made on conceptual grounds for including self-consumed energy as a service provided by the DNSP, then materiality could be checked by accessing Australian data on the quantity of energy self-consumed per DNSP per year and adding that to	Need to determine the merits of changing the ETP output from a measure of the amount of energy actually transported to a measure of underlying energy demand. Criteria historically used to guide the specification of outputs in the benchmarking framework include: 1) the output aligns with the NEL and NER objectives; 2) the output reflects services provided to customers; and 3) the output is significant in its impact on customers or DNSP costs.[159] There is a question under this framework as to whether customer self-supply represents a service provided by the DNSP to the customer, since this electricity is not transported on the distribution network. Access to comparable and reliable annual self-consumption data by DNSP would be needed from 2006 to present for Australian DNSPs. Our

[158] SA Power Networks' submission supported a review of energy throughput and ratcheted maximum demand and whether energy that is self-consumed and energy exported to the transmission network should be added back in. AusNet Services' submission supported assessing the appropriates of capturing self-consumption in the output measures (energy delivered and ratcheted maximum, and reliability) acknowledging it would require estimation techniques or purchasing data from inverter aggregators/manufacturers. The Consumer Challenge Panel submission supported consideration of a new definition of the energy throughput output to ensure it reflects two-way energy flows.

[159] AER 2012, *Better Regulation: Expenditure forecast assessment guidelines for electricity distribution and transmission*, Issues Paper, pp.74-75.

Possible impacts of export services	Possible option for change / materiality check	Implementation issues to resolve
equal, decrease the ETP on a distribution network, resulting in a lower output and leading to a decrease in productivity scores.	the existing ETP measure to determine the impact on the PIN model productivity results.	understanding is that this may likely require purchasing data from data holders. **Final assessment to take account of:** Decision to implement in the future should be based on the conceptual merits of this option, the availability of robust data, implementation costs, and the materiality of the change.
The *Ratcheted Maximum Demand (RMD)* output is currently measured by the non-coincident summated raw system annual maximum demand (in MW) at the transmission connection point. For each connection point the peak delivery hour may be different, and in this sense, they are non-coincident. RMD is intended to measure the highest level of energy demand a distribution network has had to meet up to that point in the time (from 2006 to present). RMD issue 1: Energy generated and exported locally can decrease maximum demand at the time annual maximum demand at a connection point is recorded. RMD issue 2: Energy generated and self-consumed can decrease maximum demand at the time annual maximum demand at a connection point is recorded.	**Possible option**: Modify the definition of the existing RMD output to account for export services by adding in the amount of energy exported and / or energy self-consumed during the same hourly periods that are used to calculate the maximum demands to create a measure that accounts for the level of underlying maximum demand a network could have to meet at a connection point rather than the maximum amount of energy a network actually transports at a connection point.[160] **Draft view on materiality of impact on productivity results**: the impact of adding energy exported or energy self-consumed to RMD is likely to be small at present. - Daily peak electricity demand in mornings and evenings typically coincides with low levels of small-scale solar PV generation meaning relatively low amounts of energy would be exported or self-consumed at these times limiting the potential increase or revision to RMD measure. This is particularly true of winter peaks in electricity demand, but less so for summer peaks. - RMD as currently measured uses the highest maximum demand a DNSP has historically had to meet up to now. A revised RMD measure (with energy exported and / or self-consumed added in) would have to	Need to determine the merits of changing the RMD output from a measure of the maximum amount of energy actually transported at a connection point to a measure of the level of underlying maximum demand a network could have to transfer at a connection point (in the absence of small-scale solar PV generation that is exported or self-consumed). Criteria historically used to guide the specification of outputs in the benchmarking framework include: 1) the output aligns with the NEL and NER objectives; 2) the output reflects services provided to customers; and 3) the output is significant in its impact on customers or DNSP costs.[161] There is a question under this framework as to whether customer self-supply represents a service provided by the DNSP to the customer, since this electricity is not transported on the distribution network. Access to comparable and reliable timed energy self-consumed data by connection point by DNSP would be needed from 2006 to present for Australian DNSPs (noting this could also be needed for international DNSPs if the application was extended from the PIN

[160] ibid.

[161] AER 2012, *Better Regulation: Expenditure forecast assessment guidelines for electricity distribution and transmission*, Issues paper, pp.74-75.

Possible impacts of export services	Possible option for change / materiality check	Implementation issues to resolve
	exceed the historical maximum RMD amount to have any impact on the benchmarking results. **Materiality check:** If a case can be made on conceptual grounds for including energy exported and / or self-consumed energy as a service provided by the DNSP, then materiality could be checked by accessing Australian data on the average quantity of energy exported and / or self-consumed by DNSP during the same peak hours over which the maximum demands at transmission connection points are calculated and adding that to the existing RMD measure to determine the impact on the PIN model productivity results.	models to the econometric opex cost function models). Our understanding is that this may likely require purchasing data from data holders. The availability of data may also be limited in some jurisdictions by the incomplete penetration of interval metering. **Final assessment to take account of:** Decision to implement in the future should be based on the conceptual merits of this option, the availability of robust data, implementation costs, and the materiality of the change.
The *Reliability* output or customer minutes off-supply (CMOS) could be impacted by export services to the extent network expenditure to provide export services also improves DNSPs' ability to maintain supply / reduce customers loss of supply (i.e., reliability).	**Possible option**: No change to Reliability output required. However, the extent to which the reliability / CMOS output does not capture benefits of export services expenditure, a new output measuring the level of export services provided could be needed (see below). **Draft view on materiality of impact on productivity results**: it is unlikely that export service-related expenditures would have a material impact on the existing reliability measure (by reducing CMOS) as these types of expenditures are primarily targeted at improving power quality and voltage compliance rather than improving a network's ability to maintain power supply. **Materiality check**: If an in-principle case can be made that export service expenditures can improve reliability (reduce CMOS) then materiality could be checked via an engineering assessment of network expenditures undertaken to provide export services to determine the extent to which they are likely to impact the existing reliability output and impact the PIN model productivity results.	Need to confirm the preliminary view that export service expenditures have no material impact on the existing reliability output (by reducing CMOS).

Possible impacts of export services	Possible option for change / materiality check	Implementation issues to resolve
There is currently no Export Services output in the benchmarking models to explicitly account for the level of Export Services (or Hosting Capacity) provided by DNSPs.	**Possible option**: Add a new output to proxy of the level of export hosting services provided by a network.[162] A first approach to do this could involve using a simple / broad proxy such as export services customer numbers as a proportion of total customer numbers and calculating new output weights in the PIN benchmarking models based on export services cost data (rather than the currently used econometric method[163]).[164] A second, even more data intensive approach could be to adopt a curtailment measure as a negative output as a better proxy of the level of export hosting services provided by a network and using the CECV to weight this output. Given that the provision of export hosting services has value in alleviating constraints to customers exporting energy, a curtailment-based measure appears to be a more direct measure than is a broad measure of the overall scale of the export services hosting task. As noted in section 3, while 'involuntary export curtailment due to network constraints' represents an ideal metric, it is not currently measurable or cost-effective to measure. **Draft view on materiality of impact on productivity results**: it is unlikely that adding a new exports services output would have a large impact on productivity results based on the likely magnitude of the weights that would be applied under the first or second options.	Determine if a new exports services output is needed subject to potential changes to the ETP and RMD measures, and assessment of the effect expenditure to increase hosting capacity may have on CMOS. Criteria historically used to guide the specification of outputs in the benchmarking framework include: 1) the output aligns with the NEL and NER objectives; 2) the output reflects services provided to customers; and 3) the output is significant in its impact on customers or DNSP costs.[166] First approach: Access to comparable and reliable annual data by DNSP from 2006 to present for Australian DNSPs for export services customer numbers (to construct an indicative proxy of the overall scale of export hosting task), and export services opex and capex (to estimate new output weights), noting this could also be needed for international DNSPs if the application was extended from the PIN models to the econometric opex cost function models. Second approach: Access to annual data by Australian DNSPs from 2006 for calculation of a curtailment measure (for example, curtailment could be measured

[162] SA Power Networks, Ausgrid and AusNet Services submissions stated that this option should be considered as part of a holistic review of model specifications. SA Power Networks noted potential metrics could include 'CER energy kW as a shorter-term proxy and 'total utilised Customer Energy Resource (CER) generation in the longer-term.

[163] Consideration could be given to the feasibility of moving from using export services cost data to calculate output weights for the new export hosting services output developed to an econometric based approach.

[164] Export services cost data is the additional (incremental) capital and operating expenditure that would not otherwise be needed, but for the fact that part of energy throughput is 'reverse flow' electricity from exporting customers. Ensuring that these are costs that would not otherwise be incurred but for the export services is important to avoid double counting export hosting services with other outputs (such as reliability).

[166] AER 2012, *Better Regulation: Expenditure forecast assessment guidelines for electricity distribution and transmission*, Issues Paper, pp.74-75.

Possible impacts of export services	Possible option for change / materiality check	Implementation issues to resolve
	- An output weight based on export services cost data is likely to be small given the relatively small proportion of total costs exports service expenditure accounts for (based on currently available data). - An output weight based on the CECV is also likely to be small and decreasing falling to zero in 2026-27.[165] **Materiality check**: Materiality of the first approach to adding a new output should be checked by using export services customer numbers (to construct a proxy of the level of export services), and export services opex and capex (to estimate new output weights) and adding these to the existing RMD measure to determine the impact on the PIN model productivity results. **Materiality check**: Materiality of the second approach would require checking the impact on any new curtailment output weighted by the CECV to determine the impact on the PIN model productivity results.	by the volume or percentage of exports prevented due to static and dynamic constraints). This is the subject of the consultation being conducted on if / how a financial incentive mechanism can be developed analogous to the STPIS. Any curtailment-based measure for benchmarking would be based on the same metric, if and when developed. The CECV values needed to weight any curtailment output are available now. **Final assessment to take account of:** Decision to implement in the future should be based on the conceptual merits of this option, the availability of robust data, implementation costs, and the materiality of the change.
The existing five physical capital input measures may not adequately capture changes in export services-related capex and the resultant capital stock. The 'Transformer & Other' capital input has the largest weight of the 5 capital inputs that comprise the total Capital Input index. 'Transformers' includes zone substations, distribution substations and their associated transformers. 'Other' assets include all other	**Possible option**: Disaggregating the existing 'transformers and other capital' input measured in megavolt-amperes (MVA) into a 'transformers capital input and an 'other capital' input, which would include non-transformer-upgrade export services capex to measure capex otherwise not accounted for under the existing capital stock inputs.[167] This would ensure that additional inputs needed to provide export services which do not fall into the existing input categories can be adequately captured in the benchmarking models.	Determine the merits / risks creating a 'transformers capital input and an 'other capital' input. Our preliminary view is that no additional data is needed from DNSPs to implement this option. **Final assessment to take account of:** Decision to implement in the future should be based on the conceptual merits of this option, the availability of

[165] Oakley Greenwood, *CECV Methodology Final Report 14 June 2022*, prepared for Australian Energy Regulator.

[167] Submissions made no comments explicitly on this option. Ergon Energy & Energex and AusNet Services agreed that inputs and output should be considered as part of a full review of model specifications. SA Power Networks and CitiPower, Powercor & United Energy highlighted any review should consider the interrelationships between export services and other benchmarking variables.

Possible impacts of export services	Possible option for change / materiality check	Implementation issues to resolve
assets, among them digital communications and system IT assets. The quantity of 'Transformer & Other' capital input is measured by distribution transformer MVA plus the sum of single-stage and the second stage of two-stage zone substation level transformer MVA. That is, a measure of the quantity of Transformer inputs. At present, it is implicitly assumed that movements in the quantity of Transformer inputs are a good proxy for movements in the quantity of Other capital inputs. To the extent that new network developments, especially the provision of export services, require a shift in the mix of capital towards using a relatively greater amount of Other capital, then movements in the quantity of Transformer inputs may no longer serve as a good proxy for movements in the quantity of Other capital inputs. In that case, there may be value in disaggregating these two inputs.	- The weight applied to transformer inputs would equal AUC transformers divided by total cost. - The weight applied to 'other capital' inputs would be AUC 'other export services capital' divided by total cost. The quantity of 'transformer inputs' would continue to be measured by distribution transformer MVA plus the sum of single stage and the second stage of two-stage zone substation level transformer MVA. The quantity of 'Other capital input' would be equal to the RAB for Other capital deflated by a suitable deflator for the relevant types of capital published by the ABS. **Draft view on materiality of impact on productivity results**: The effect of this change on the benchmarking results is uncertain without testing it. It will depend on how different the movements in the quantity of 'Other capital' input are compared to the movements in 'Transformer inputs'. **Materiality check**: Materiality could be checked by disaggregating the existing data used to measure the current 'transformers and other capital' input to calculate the two new capital inputs and their weights to determine the impact on the PIN model productivity results of the change.	robust data, implementation costs, and the materiality of the change.

5.3.3 Revised approach to determining how the benchmarking models could be adjusted to account for exports services

Drawing on the draft analysis set out in Table 2, we have set out below our draft views on the next steps to assessing and addressing the impact of export services on our benchmarking models. We propose the immediate next step is to consult on what data we can start collecting to allow us to undertake the proposed 'materiality checks' and assess the feasibility of implementing possible options for adjusting the benchmarking models. We consider this is the most pragmatic short-term focus. With the benefit of improved information and data we propose initiating a review of the benchmarking models by 2027 to determine the materiality of the impacts of export service on the benchmarking results and the best combination of possible changes to account for export services.

We do not support the option of excluding exports service inputs from the benchmarking models

As noted in section 5.2 and Table 2, some DNSPs proposed excluding export services opex and capital stock inputs from the benchmarking models. This option was suggested as an alternative to adjusting the model specifications to better account for export services given that data needed to do this may not be available and that export services could be separately benchmarked using other partial techniques.[168] This approach was opposed by other networks, which noted that the approach would reduce the overall accuracy of benchmarking.[169]

The option of removing export service inputs from the benchmarking models, while potentially a simpler and less data intensive approach (although still with data issues), is not preferred as it moves away from the holistic nature of the benchmarking framework.

The existing benchmarking models generate total productivity and cost efficiency measures by comparing how well networks use a set of capital and operating cost inputs to produce a set of outputs. This allows the models to account for and capture the impacts of the interrelationships between network inputs and outputs, thereby providing a more accurate comparison on network performance over time and against other businesses.

The suggested approach of identifying and removing a specific set of inputs from the models cannot account for the interrelated impact the export service expenditures as inputs may have on the outputs that would remain in the models. As a result, the productivity scores generated from this type of change would be likely be less holistic and less accurate, complicating their interpretation and use in assessing network efficiency and productivity.

In addition, it is not clear how feasible it would be to disaggregate or allocate costs / capital stock related to export services, particularly given that these expenditures and investments are likely to have more than one driver.

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[168] Ausgrid, AusNet Services, Endeavour Energy and Evoenergy submissions.

[169] CitiPower, Powercor & United Energy, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

There is uncertainty around the current materiality of export service impacts on productivity results, how this may change over the medium term, and better data is required to inform these materiality questions

Given the time, cost to businesses and the AER, and uncertainty involved in updating the benchmarking models, it is important to establish a robust, evidence-based 'case for change' before adjusting the existing model specifications. A critical component of the case for change is understanding the materiality of any impacts export services are having on the productivity results.

Submissions considered that the benchmarking models were being impacted by export services but did not make the case that the productivity results are being materially impacted by export services at present. Some DNSPs stated that impacts were currently small or immaterial,[170] while others, without commenting on the current level of impact, noted that the impact may increase over time.[171] Several DNSPs pointed to a lack of data on the issue and recommended further research to define the scope of the problem before advancing to a full review of model specifications.[172]

Our preliminary analysis of the available information, as outlined in section 5.3.2 Table 2, suggests that the size of any individual impacts of export services on the benchmarking models and DNSP productivity scores is likely to be small at present. We recognise that this analysis is based on limited and imperfect data, and our current understanding of, and judgement around, export service, and does not consider the combined effects of multiple impacts. We agree with stakeholder views that better data and further work will be needed to understand how export services are affecting the benchmarking results.

There is also a high degree of uncertainty around how potential export service impacts will develop over the medium term. As noted by the CCP in their submission, there is a complex mix of factors affecting the level of consumer demand for export services and the amount of hosting capacity distribution networks will need to provide. Some of these factors include how changes to feed-in tariffs, export tariffs, retail electricity prices, and the cost and availability of household storage will affect demand for export.[173] This level of uncertainty cautions against moving too quickly to assess or adjust the benchmarking model specifications before energy consumption and use trends become clearer.

Some DNSPs, as noted in section 5.2, also expressed a need for caution and taking stock to allow export services to develop as a distribution service. Jemena, for example, emphasised the need to collect 'adequate data to understand the materiality of export service cost drivers

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[170] Ergon Energy & Energex, PowerWater submissions.

[171] Ausgrid, Ergon Energy & Energex, TasNetworks submissions.

[172] SA Power Networks, CitiPower, Powercor & United Energy, Jemena, AusNet Services, Evoenergy submissions.

[173] Consumer Challenge Panel, *Submission on incentivising and measuring export service performance consultation paper*, October 2022.

and ... revisit further consultation on updating models once export services have matured and DNSPs have collected an appropriate time series of data'.[174]

Materiality checks

In light of these issues, we are proposing a series of 'materiality checks' and associated data required to establish a sufficiently robust evidence base to support a case for changing the existing model specifications. These materiality checks were outlined in the second column of Table 2. Box 1 below includes a consolidated list of the data requirements that we consider would be associated with these 'materiality checks'.

These materiality checks, once the data is available to facilitate them, would use a range of export services data from Australian DNSPs only to test different types of impacts exports services may have on the PIN benchmarking model results. Testing that includes the econometric models would require similar data for international DNSPs and is not considered viable in the short term.

We seek stakeholders' views on the materiality checks and the feasibility of collecting the associated data ahead of providing further guidance on this approach in the Final Report.

Some of the data listed in Box 1 is also proposed to be collected for performance reporting purposes described in section 4 and listed in the straw man information request provided alongside this report with 2020-21 as a proposed base year. We note that the data required for the benchmarking analysis outlined in this section will require data sets from 2006 and/or 2012 onwards for any metric to be materiality tested or to be included in updated model specifications. After consulting with stakeholders on this draft report, we will provide (in the final report) a list of consolidated export services data we will seek to collect to inform this benchmarking analysis, including definitions and guidance to improve comparability across DNSPs.

Data availability is also a significant challenge to assessing the feasibility of options for adjusting the benchmarking models and implementation of any required changes

Where an option for updating the benchmarking has been found to be material enough to pursue, we would also need to consider the feasibility of being able to implement the change.

Many distribution businesses highlighted a lack of reliable and comparable time series and international export services data as a major obstacle to adjusting the econometric opex cost function model specification.[175] To varying degrees, DNSPs noted a need for caution and further work to determine if sufficiently robust time series data can be estimated (for use in the PIN and econometric models), and the availability and appropriateness of using export services data from Canadian and New Zealand DNSPs (required for the econometric models).[176]

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[174] Jemena, *Submission on incentivising and measuring export service performance consultation paper*, September 2022.

[175] TasNetworks, Evoenergy, Jemena, Endeavour Energy, SA Power Networks, AusNet Services submissions.

[176] TasNetworks, Evoenergy, Jemena, Endeavour Energy, SA Power Networks, AusNet Services submissions.

We recognise that the types of export services data for Australian and international DNSPs that may be required to update the benchmarking models are not currently available or, in many cases, is not being collected. As noted in the previous section, we are proposing to begin collecting key time-series export services data for Australian DNSP to allow materiality testing of options for updating the benchmarking. This data may also make it feasible to implement changes to the PIN models where conceptual merits and material impacts are established.

We agree with stakeholders that collecting the equivalent types of data for international DNSPs to update the econometric models would be challenging and require further consideration of the conceptual merits and empirical feasibility in the econometric modelling. Further, until materiality testing can be undertaken in the context of the PIN models, it will also be uncertain what, if any of these international data types, will be needed to adjust the econometric benchmarking models.

Box 1, in addition to providing a consolidated list of export services data that would be needed to test the materiality of options for adjusting the benchmarking models, includes the data that at this stage we consider may be needed to implement the same set of options for the econometric models.

Given the uncertainty around which adjustments to the benchmarking models, if any, may be required, and the costs to business of collecting this data, we seek stakeholders' views on what data we should start collecting now and how available this data is. We will also discuss further as part of the broader stakeholder workshop on the draft report on 6 December 2022.

Box 1: Export services data to assess materiality and adjust model specifications

Data that may be needed to materiality check export service impacts

- Australian data on the quantity of energy self-consumed per DNSP per year from 2006 or 2012 if only the 'short' benchmarking period is examined (to check materiality of changing EPT measure in PIN models)
- Australian data on the average quantity of energy exported and the amount self-consumed by DNSP during the same peak hours over which the maximum demands at transmission connection points are calculated from 2006 or 2012 (to check materiality of adding energy exported or self-consumed to RMD in PIN models)
- Data to inform an engineering assessment of network expenditures undertaken to provide export services to determine the extent to which they are likely to reduce the existing reliability output and impact the PIN model productivity results.
- Australian data on export customer numbers as a proportion of total customer numbers (or exported electricity as a proportion of energy throughput), and export services cost data by DNSPs from 2006 or 2012 (to check materiality of adding new output to proxy export hosting services provided by a network calculating)
- Australian data to calculate a curtailment measure and annual CECVs from 2006 or 2012 (to check materiality of adding new output measuring curtailment)

Data that may be needed to implement possible model specification changes – note that the focus here is on data required for the PIN models, but that if this was extended to the econometric models relevant international data would also be required

- annual total energy self-consumed data by DNSP from 2006 for Australian DNSPs (to implement potential ETP update)
- timed energy exported and energy self-consumed data by DNSP from 2006 for Australian DNSPs (to implement potential RMD updates)
- annual export services customer numbers data (or annual exported electricity data) by DNSP from 2006 to present for Australian DNSPs (to construct proxy for new export hosting task output)
- annual export services opex and capex data by DNSP from 2006 to present for Australian DNSPs (to estimate new output weights for a new export hosting task output)
- annual curtailment data (i.e., could be volume or percentage of exports prevented due to static and dynamic constraints) by Australian DNSPs from 2006 (to estimate a new curtailment output)
- annual CECV values (to estimate the weight of any new curtailment output) for Australian DNSPs)

We propose an initial focus on data collection, prior to making any changes to its benchmarking models

In light of the above issues and uncertainties, at this stage we propose that the immediate next step is to focus on what data we can reasonably begin to collect to allow us to, in time, undertake the proposed materiality checks and assess the feasibility of implementing possible options for adjusting the benchmarking models. We consider this is the most pragmatic short-term focus. With the benefit of improved information and data we propose to initiate a review of the benchmarking models by 2027 to determine the materiality of the impacts of export service on the benchmarking models, and the best combination of possible changes that would appropriately account for export services. This would need to take into account the feasibility of being able to successfully implement these changes. Once this review is complete, and subject to its findings, we could then move to implement the models.

To inform this review, we propose to consult now on:

- the ‘materiality checks’ outlined in column two of Table 2
- the best approach for beginning to collect the exports services data that will allow us to determine the materiality of export services impacts on the benchmarking models
- what additional data we should begin to collect now and over the medium term to build the time series data that may be needed to implement adjustments to the benchmarking model specification in the future.

The timing of the future review should ensure we have sufficiently robust export services time series data for Australian DNSPs available to make a reliable assessment of export service impacts on the benchmarking, their materiality, and the feasibility of implementing

any required changes. It should also allow export services to develop, giving us a clearer understanding of the trajectory of customer demand for export services, the associated impact on network inputs and outputs, and the likely costs to businesses and the AER of updating the benchmarking data sets. Where sufficient data becomes available earlier that 2027 to allow us to resolve these issues, we may consult with stakeholders on initiating a full review sooner.

Question 15

Do you agree with our revised approach for reviewing if and how benchmarking models can be adjusted to better account for export service, including:

- not further considering the option of excluding exports service inputs from the benchmarking inputs?
- the materiality checks in Table 2 (column 2) proposed to establish the benefit of options to adjust the benchmarking models?
- the final assessment criteria in Table 2 (column 3) proposed to decide whether to proceed with an update or not?
- initiating a full review of the benchmarking models by 2027 to determine the materiality of export service impacts, the best combination of changes to appropriately account for export services, and the feasibility of successfully implementing these changes?

Question 16

For the list of export services data in Box 1 needed to assess materiality of potential export service impacts, considering the uncertainty around which adjustments, if any, may be required and the costs to business of collecting the data:

- what data should we start collecting?
- what data are you able to / not able to begin reporting?
- what data may be feasible to report on in the future?

Question 17

For the list of export services data in Box 1 needed to implement possible adjustments to the benchmarking models, considering the uncertainty around which adjustments, if any, may be required and the costs to business of collecting data:

- what data should we start collecting?
- what data are you able to / not able to being reporting?
- what data may be feasible to report on in the future?

Question 18

For the Canadian and New Zealand DNSPs currently used in the econometric benchmarking, what are the key issues that would need to be resolved to determine if it were appropriate to continue to use these jurisdictions to update the econometric models for export service impacts? What data and information could we begin to collect to resolve these issues? What alternatives to the Canadian and New Zealand DNSPs could we consider, if their use was not appropriate?

Attachment A: Stakeholder feedback template

The template below has been developed to enable stakeholders to provide their feedback on the questions posed in this draft report and any other issues to which they would like to provide feedback. The AER encourages stakeholders to use this template and to provide reasons for stakeholders' views to assist the AER in considering the views expressed by stakeholders on each issue. Stakeholders should not feel obliged to answer each question, but rather address those issues of particular interest or concern. Further context for the questions can be found in the consultation paper.

1. Submitter details

ORGANISATION:

CONTACT NAME:

EMAIL:

PHONE:

Section 3: Incentive review for export services

AER Question	Stakeholder feedback
1. Do you agree that no amendments to the DRMG are necessary?	
2. Do you agree with our proposed timeline for a future review of incentive arrangements for export services? What factors may prompt an earlier or later review?	
3. Do you agree that developing a new small-scale incentive scheme is the best way to facilitate DNSPs proposing bespoke incentives?	
4. What level of revenue at risk (rewards and penalties) is appropriate for a small-scale incentive scheme for export services?	
5. Do you consider that the benefits associated with a small-scale incentive scheme for export services will outweigh the costs of measuring performance and administering the scheme?	
6. Are there any other factors we should consider when developing a new small-scale incentive scheme?	
7. Do you agree that no amendments to the DMIAM and DMIS are necessary?	

Section 4: Export service performance reports

AER Question	Stakeholder feedback
8. Is there any data we are missing that should be included in our key metrics?	
9. Do you foresee any challenges in collecting the new data for the key metrics? Can you identify any additional costs associated with data collection?	
10. Do you agree with the proposed base year for 2020-21 for most metrics and 2022-23 for metrics where data may be less available? Please suggest an achievable timeframe for metrics where the proposed reporting date is not feasible.	
11. Do you agree with the level of data disaggregation in the strawman information request (typically disaggregated by customer type and feeder classification, with some exceptions)? Please provide your views and reasons if you consider specific data should be disaggregated at a different level to that proposed.	
12. Is any of the proposed data ambiguous? If the information request would benefit from additional definitions or specification, please provide your suggestions.	

Section 5: Update to benchmarking reports

AER Question	Stakeholder feedback
13. Do you agree that we should not proceed with developing an export services OEF at this time?	
14. Do you agree with our draft views summarised in Table 2, including on: • the potential impacts of export services on the benchmarking models? • the possible options for addressing these impacts? • the early 'indicative' views of the materiality of changes to the productivity results of implementing these options? • key issues that would need to be resolved before changes to the models could be implemented? In providing your comments on each issues, please include any rationales and evidence in support of your views.	

15. Do you agree with our revised approach for reviewing if and how benchmarking models can be adjusted to better account for export service, including: • not further considering the option of excluding exports service inputs from the benchmarking inputs? • the materiality checks in Table 2 (column 2) proposed to establish the benefit of options to adjust the benchmarking models? • the final assessment criteria in Table 2 (column 3) proposed to decide whether to proceed with an update or not? • initiating a full review of the benchmarking models by 2027 to determine the materiality of export service impacts, the best combination of changes to appropriately account for export services, and the feasibility of successfully implementing these changes?	
16. For the list of export services data in Box 1 needed to assess materiality of potential export service impacts, considering the uncertainty around which adjustments, if any, may be required and the costs to business of collecting the data: • what data should we start collecting? • what data are you able to / not able to begin reporting? • what data may be feasible to report on in the future?	
17. For the list of export services data in Box 1 needed to implement possible adjustments to the benchmarking models, considering the uncertainty around which adjustments, if any, may be required and the costs to business of collecting data: • what data should we start collecting? • what data are you able to / not able to being reporting? • what data may be feasible to report on in the future?	
18. For the Canadian and New Zealand DNSPs currently used in the econometric benchmarking, what are the key issues that would need to be resolved to determine if it were appropriate to continue to use these jurisdictions to update the econometric models for export service impacts? What data and information could we begin to collect to resolve these issues? What alternatives to the Canadian and New Zealand DNSPs could we consider, if their use was not appropriate?	

Attachment B: Draft AER position on performance metrics

This section summarises metrics to potentially include in the inaugural report. This discussion is arranged by:

- Contextual metrics raised in the consultation paper (Table B.2)
- Contextual metrics raised in submissions (Table B.3)
- Performance metrics raised in the consultation paper (Table B.4)
- Performance metrics raised in submissions (Table B.5)

Metrics identified for inclusion in the inaugural report are included in the strawman information request, which we have developed in the form of a regulatory information instrument workbook and published alongside this draft decision. For convenience with navigating this content, the workbook includes a definitions tab as well as tabs 11.8 and 11.9, which reflect content already proposed in the pre-draft regulatory information order (RIO). It also includes tab 11.0, which includes information yet to be proposed in the pre-draft RIO. The metrics discussed below are also identified in column A of the strawman information request with reference numbers: C1–C8 for contextual metrics and P1–P5 for performance metrics.

Contextual metrics for the inaugural report

The first two columns of Table B.2 include the proposed contextual metrics and reasons for inclusion as set out in the consultation paper. The second two columns summarise stakeholder responses to this proposal, and the draft AER position having considered those responses.

Table B.2: Draft position on contextual metrics proposed in the consultation paper

No.	Contextual metric	Reason for inclusion in consultation paper	Stakeholder response	Draft AER position
C1	Customer number metrics: number of export customers at end of period (’s)	Useful as an input for developing other measures and for providing contextual information such as establishing a baseline and understanding customer energy resources impact and penetration. Also, relatively easy and cost effective	AusNet Services suggested we only focus on available data, which includes consumer energy resources connections. No stakeholders raised concerns with this measure, and several stakeholders	Include in inaugural report. This data has also been proposed for inclusion in the draft RIO under tables 11.8.4 (disaggregated by feeder type) and 11.8.5 (disaggregated by consumer energy resource type).

		to measure, particular as data is already provided through AEMO's DER register.	emphasised the importance of reporting contextual information. CCP expressed interest in using this data to report the proportion of export customers.	This data is a useful input for other measures and is already reported for AEMO's DER register.
C2	Capacity metrics: installed capacity (kVA) - Complemented by battery and generation installed storage capacity (kVAh)	Installed capacity is useful as an input for other measures and for contextual information such as establishing a baseline and observing the potential to store generated energy. It is also relatively easy and cost effective to measure, particularly as data is already provided through AEMO's DER register. - We considered installed storage capacity could be useful for understanding the potential for self-consumption and to estimate curtailment due to network constraints.	As above with respect to installed capacity. CCP also specifically supported reporting on installed capacity. On installed storage capacity, PowerWater submitted that it does not currently have data on actual battery capacity.	Include installed capacity (KVA). This data has also been proposed for collection in the draft RIO under tables 11.8.6 (disaggregated by customer type) and 11.8.7 (disaggregated by feeder classification and type of consumer energy resource). Do not collect installed storage capacity measures as it is not clear how we would use or interpret this information in addition to general capacity measures, which already disaggregate for battery capacity.
C3	Customers with compliant inverters of the total export customer population on the network (%)	This measure is calculated as customers with AS4777.2 compliant inverters divided by export customers and is therefore based on available data. This metric helps us to monitor network readiness for flexible export limits (or dynamic operating envelopes).	PowerWater does not have data on inverter compliance and other stakeholders have questioned why we would collect this data. In contrast, AusNet Services considered this data could be valuable in the long-term, along with the number of devices behind the meter capable of flexible export limits.	Include data at an aggregate level and allow for "compliance unknown" to be a valid response. Non-compliant inverters present risks for voltage management and limit the hosting capacity DNSPs can allocate. As such, this reflects a factor that is not necessarily within DNSPs' control that affects hosting capacity.
C4	Customers receiving overvoltage ('s)	This is a performance indicator for more general network services rather than being specific to exports. However, it is a contextual metric to better understand export service performance. If consumer energy resource penetration and overvoltage	Voltage quality is useful but affects more than export customers and is difficult to attribute to exports (Endeavour Energy, Jemena). Moreover, export curtailment due to inverter overvoltage is unlikely to be material in the future (Jemena).	Collect data on customers receiving overvoltage for the inaugural report. Consult on Cadency's suggestion to collect more detailed voltage data before collecting this data. Overvoltage data is useful as it may signal export-related constraints

		are both high at a particular feeder, this may signal that voltage issues due to high levels of export should be better managed.	Cadency Consulting (Cadency) considered voltage curtailment data valuable because if voltage is too high or low, the inverter reduces or halts production of consumer energy resources into the grid. Cadency recommends reporting: average voltages, percentage exceedances (below 216V and above 253) and trends in average voltages. This can be achieved by collecting the following data (available from Victorian smart meters today): • 10-minute average data (count) for voltages between 207V and 260V • Count of active smart the DNSP had voltage access to Cadency also recommended considering a means for estimating the export curtailment based on this voltage data.	(limitations in hosting capacity). It would be particularly informative when triangulated with other measures (e.g., observing relationships between changes in installed capacity and voltage levels in particular locations). We have also been advised that it would be valuable to monitor the relationship between export capacity and voltage. Cadency's recommendation would result in a large quantity of data (one data point every 10 minutes for every export connection). We would like to first understand if materially higher benefits would be gained from this data in addition to reporting on customers experiencing overvoltage.
C5	Estimated capex for the primary purpose of consumer energy resource integration by reason (a) Export-related overvoltage complaint management, other opex Estimated opex for the primary purpose of CER integration by reason: ICT capex,	This metric would be qualified given its current subjectivity in measurement and until more consistent data becomes available. It will likely be useful for understanding what actions individual DNSPs are doing over time rather than making comparative judgements between different DNSPs. It is valuable to start collecting as it will provide useful contextual information over a longer time series when considered alongside where export capacity has been limited and where overvoltage issues have occurred. It will also be needed to inform any changes to the AER's benchmarking and in export service-related expenditure proposals lodged with the AER.	AusNet Services supported reporting on expenditure related to CER enablement, as this is a measure where data is available. This information should help to inform the kind of analysis that PowerWater suggested, recognising that some qualitative analysis will also be valuable for complementing a broad suite of partial indicators. Specifically, PowerWater requested we comment on DNSPs' approaches to export-related planning and investment.	Propose to collect data for the inaugural report. This data has also been proposed for collection in the draft RIO under tables 11.8.1-2. Given most DNSPs are in an early stage of investing in consumer energy resource integration, we do not expect to receive a rich dataset for comparative analysis in the inaugural report. However, we expect this data will complement what we are seeing in other measures to tell a richer story around what activities DNSPs are undertaking to integrate consumer energy resources.

	network monitoring capex, other capex			

The first two columns of Table B.3 include proposed contextual metrics suggested in submissions to our consultation paper, and the reasons stakeholders provided for their inclusion. The third column summarises the draft AER position on whether to include the proposed metrics in our inaugural report. Rows that have "N/A" as a reference number do not have a metric assigned to it in the strawman information request.

Table B.3: Draft position on contextual metrics identified in submissions

No.	Contextual metric	Reason for inclusion in submissions	Draft AER position
N/A	Network-specific basic export levels in (i) now, (ii) one year, (iii) two years.	AusNet Services submitted connection agreements and basic export levels provide helpful contextual information. Several measures depend on this factor: approved to requested capacity ratio, approved to requested connected generation capacity ratio and customers receiving voltages and/or tripping of solar inverters. ECA supported reporting on basic export level(s) (i) now (ii) in 1 year, (iii) in two years.	We will not include this information in the inaugural report as it will not be available. Basic export levels (along with export tariffs) will commence with the next round of resets commencing in 2024-25.[177] Once there is information on basic export levels, we propose to report it. We will have oversight of basic export levels as they must be specified in any new export tariff and will be set for ten years (but can be reopened).
N/A	Jurisdictional voltage regulations	AusNet Services submitted that this contextual information is helpful as the approved to requested capacity ratio, approved to requested connected generation capacity ratio and customers receiving voltages and/or tripping of solar inverters depend on this factor.	Our understanding is that we would not need to issue information requests to collect this data. However, we agree that we could include this as contextual information in our inaugural report.
N/A	Intrinsic hosting capacity, weather and climate, network type and customer preferences	ENA and CitiPower, Powercor & United Energy submitted that this contextual information is valuable for understanding operating factors influencing export capacity and export levels. They submitted that this information would include intrinsic hosting capacity, weather and climate, network type and customer preferences	We will not collect specific data unless further consultation reveals how this should be specified. We are proposing to report on measures of hosting capacity (measures P1 and P2 in Table B.4). We are also proposing to collect certain measures by feeder type, which will capture network type.

[177] Details around basic export levels are set out in AER, *Export tariff guidelines*, May 2022.

C6	Customer complaints relating to export services per export customer (’s) - Complemented by complaints relating to overvoltage	AusNet Services suggested complaints data as there is available (rather than modelled) data. CitiPower, Powercor & United Energy suggested that this could be a contextual descriptor. The CCP supported the use of complaints data, but also cautioned against using the number of voltage complaints as a core indicator (and if this is tracked, to also consider low voltage complaints). Other submissions showed less support for complaints data: • Endeavour Energy saw this as limited. It is a lagging indicator that likely understates the impact of export constraints given only engaged customers make such enquiries. • Jemena submitted that DNSPs are generally unable to determine if customer complaints relating to overvoltage were caused by CER devices • This data is not currently available for PowerWater.	Collect this data for the inaugural report. We were already proposing to collect data on “complaints relating to export services” in table 11.9.1 of our draft RIO. We are interested in complaints data relating to export services. We understand that this may not be available and complaints relating to overvoltage may be the best available proxy. As such, have requested data on both types of complaints (DNSPs may respond with “N/A” for any unavailable data). Complaints data is valuable as it provides a direct measure of customer dissatisfaction in relation to export services. While this would not be well measured across all DNSPs and would likely be captured inconsistently, we expect this data will improve once established as required information.
C7	Total consumer energy resource exports enabled, specified as net metered volume of energy exported (MWh)	CitiPower, Powercor & United Energy suggested looking at this metric alongside metrics suggested by SA Power Networks (duration of full export access, export service levels achieved) to incentivise DNSPs to allow additional export capacity. The CCP supported reporting on energy exports. It also raised reporting on the ratio of energy exported to energy demand (of which we would require total exports to calculate).	Collect this data for the inaugural report. We were already proposing to collect this data in our draft RIO under table 11.8.3. This is an important measure of hosting output. However, it is driven by factors outside of DNSPs’ control and therefore suitable for providing contextual information.
C8	Total utilised consumer energy resources generation. This measures the energy able to be produced by consumer energy resources, accounting for self-consumption and exports.	Recommended by SA Power Networks as a performance metric identified through its research under Race for 2030. This metric captures the total value to consumers of their energy resources by capturing both self-consumption and exports. SA Power Networks considers its inclusion would encourage efficient enablement of solar and avoid disincentivising self-consumption.	Collect this data from the 2022-23 regulatory year for inclusion in the inaugural report. We agree that reporting on self-consumption alongside exports is needed to provide a full picture of consumer energy resource integration. This metric was identified as a headline export service quality metric by RACE for 2030 because it seeks to drive a net improvement in the productive use of consumer energy resources while limiting export congestion.[178]

[178] Race for 2030, *Measuring and communicating network export service quality: Final report*, 2022, p. 6.

		Endeavour Energy considered export-based measures valuable, but also considered measures that capture self-consumption important as it is important to encourage.	We agree with the usefulness of this metric, but also consider it contextual information. This measures what energy consumers generate and use rather than the availability or quality of network export services, and therefore captures outcomes that are largely outside the control of DNSPs.

Performance metrics for the inaugural report

The performance metrics proposed in our consultation paper (summarised in Table B.4) were informed by our consultation with DNSPs at the end of 2021, which resulted in us issuing an information request to them in early 2022 to understand what export service-related data they held at that time for the 2020–21 financial year.[179] These proposed metrics were also informed by the five criteria for performance measures discussed in our consultation paper. These included whether the metric would: (1) be measurable, (2) not be materially influenced by exogenous factors, (3) not lead to perverse incentives or perverse service outcomes, (4) be cost effective to measure, and (5) reflect services provided to customers.

Having had regard to submissions received on the consultation paper, we have formed the draft position in Table B.4. The first two columns of Table B.4 include the proposed performance metrics and reasons for inclusion as set out in the consultation paper. The second two columns summarise stakeholder responses to this proposal, and the draft AER position having considered those responses.

Table B.4: AER position on performance reporting metrics proposed in the consultation paper

No.	Performance metric	Reason for inclusion in consultation paper	Views raised in submissions	Draft AER position
P1	Approved to requested to export capacity ratio (%). This is calculated as approved export capacity (kVA) divided by customer	Metric is based on data that is currently broadly available. This metric would proxy curtailment if customer requested capacity reflects what they would have used. It also provides a proxy for servicing exporting customer preferences and would highlight if	Several stakeholders supported this measure: - Cadency supported using this metric, particularly as static export limits are the main source of export curtailment. - CCP supported this measure.	Collect this data for the inaugural report. We were already proposing to collect this data in our draft RIO under tables 11.9.3-11.9.5.

[179] We summarised the data we received and its limitations in Attachment B of our consultation paper.

	requested export capacity (kVA). - Complemented by export customers provided with export limit below requested (’s, %)	there are clear differences between locations (feeders) and customer types. - Customer numbers can highlight where outliers may bias results. For example, it may highlight if the approved to requested capacity is low on a feeder because one customer requested excessively high export capacity.	- CitiPower, Powercor & United Energy saw this as a measure of intrinsic hosting capacity and as relatively valuable for indicating network performance. It also warned that it may also be affected by customers requesting higher capacity than they would use and would be higher for DNSPs that previously invested heavily in consumption services. Jemena did not support this measure as customers determine the denominators, and therefore outcomes would be outside DNSPs’ control. SA Power Networks also raised this concern. SA Power Networks also considered this metric likely meaningless for small customers as their applications are generally not assessed individually and typically provide 5kW as a default limit. SA Power Networks also submitted that where DNSPs have flexible export offers, approved capacity has no relationship to actual service performance.	This metric has value as a measure of intrinsic hosting capacity and planned export curtailment. The strawman information request specifies that this metric only applies to static export limits. It should also only capture requests for a specific level of export capacity and not connection agreements accepted as a default. These specifications aim to address some of the concerns raised by SA Power Networks.
P2	Approved export capacity to installed capacity (kVA as a difference, % as a ratio). This metric uses data already collected for metrics C2 and P1.	Assessing allowable export capacity against installed capacity tracks network availability to support exports.	CitiPower, Powercor & United Energy sees this as relatively valuable for indicating network performance and intrinsic hosting capacity. However, it may also be affected by customers installing capacity in locations with low hosting capacity that are uneconomic to upgrade. It will also be higher for networks that previously invested heavily in consumption services Jemena submitted that this ratio will not meaningfully or accurately capture export service performance as customers determine the denominators and therefore this is outside DNSPs’ control. SA Power Networks considered this metric is likely to be problematic where networks have flexible export offers.	Include this metric in the inaugural report. No specific additional data is required for this metric, so there is no additional data collection cost. Many of the concerns raised stem from P1 above, which we consider are sufficiently mitigated given the benefits of having this data.

P3	Percentage of export customers with (a) static zero export limits, (b) non-zero static export limits, (c) dynamic/flexible export limits	Data is currently available and metrics both track performance and provide contextual information. For instance, this will help us to track and delve deeper into: - Is a high incidence of static export limits correlated with network constraints? If it is not, why are limits being imposed? If it is, are there plans to address the constraint (if doing so is economic)? - When actions occur to remediate network constraints, do static export limits continue? - Are dynamic/flexible export limits being used when they represent a feasible and logical solution to manage network constraints?	AusNet services supported using data on export limits as this is currently available, but suggested we also report on what export limits customers receive. CitiPower, Powercor & United Energy saw no value in this data, but rather submitted that information on the size of the limits is what customers value. The CCP supported reporting on consumers with dynamic export arrangements. Cadency recommended annual (or monthly) data collection on flexible export limits to include: - the number of customers on flexible export limit - the average export upper limit (kW) - the average time the upper limit was unavailable (hours) - potential exports curtailed by the flexible export limits (kWh) - potential exports curtailed by the flexible export limit due to accepted exclusions (kWh).	Include this metric in inaugural report. Only collect data on flexible export limits from 2022-23 given its availability. Also, expand on the data to also collect: a) non-zero static export limits average limit (kW) b) dynamic/flexible export limits (i) average upper limit (kW) and (ii) average time the upper limit was unavailable (hours) This additional data will provide information on the magnitude of export limits, which is important if there is a practice of applying high static export limits that do not have a binding effect.

The first two columns of Table B.5 include proposed performance metrics suggested in submissions to our consultation paper, and the reasons stakeholders provided for their inclusion. The third column summarises the draft AER position on whether to include the proposed metrics in our inaugural report.

Table B.5: AER position on performance metrics identified in submissions

No.	Performance metric	Reason for inclusion in submissions	Draft AER position
P4	Duration of full export access. This measures the time customers experience uncurtailed	Recommended by SA Power Networks, which was identified through its research under Race for 2030. SA Power Networks submits that some of the benefits of this metric are that it can account for periods of voltage and dynamic curtailment, whilst also	Collect data from 2022-23 to include in the inaugural report. Duration of full export access was identified as a headline export service quality metric by RACE for 2030. Race for 2030 found this metric would

	access up to their set limit. (%)	excluding curtailment due to customers installing larger systems than in their agreement. Duration of full export access was also supported by Ausgrid and CitiPower, Powercor & United Energy. Ausgrid favoured this metric as capturing the ability of DNSPs to meet customer priorities. CitiPower, Powercor & United Energy also supported the measure as providing information on export service performance delivery, whilst also benefiting from being largely within DNSPs' control. It suggested complementing it with a volumetric measure of total exports to avoid perversely incentivising DNSPs to limit export capacity.	account for periods of voltage-related curtailment and dynamically signalled export limitations and could be used to define and communicate the network export availability dimension of export service product offers.[180] This data is valuable to consider alongside information on the export limits imposed in connection agreements.
P5	Duration of no export access (%)	Jemena proposes we collect data on how often customers are fully constrained from exporting during a specific period, such as in a regulatory year. This metric could apply to both static and dynamic export limited customers. This would prevent DNSPs from being penalised from delivering poor performance when they partially constrain customers' capacity dynamically. Ausgrid considered similar information valuable by suggesting we report on the ability of DNSPs to meet customer priorities, and a way to do this was to report the time during a year customers can export to the grid. This metric is the inverse of 'no export access' and therefore contains the same information.	Collect data from 2022-23 to include in the inaugural report. This measure differs from the inverse of P4, which would measure when export customers receive any less than the full export access specified in their connection agreements (in the case of a network constraint, for example). In contrast, duration of no export access measures the export-equivalent of a power cut. This provides additional information about the magnitude of operational curtailment in absence of estimating specific export curtailment levels.
P6	Connection time (days)	Metric proposed by ECA, which will align with the 'new connection' service parameter in the existing STPIS for consumption services. Lower connection times are valued by consumers as no export value is received until installed solar systems are connected.	Include in inaugural report disaggregated by customer type. We agree with ECA that connection times are a measure of service performance. These are also observable and within DNSP's control.
N/A	Solar size satisfaction score	Metric proposed by ECA to measure consumers' satisfaction with the size of their solar system, considering the payback period determined by their export service and the information that their solar provider gave them about possible network limits.	Do not include in inaugural report. It is not clear that DNSPs are the most suitable party to collect such data. Given the potential for subjectivity and bias, this would appear more suitably collected by

[180] Race for 2030, *Measuring and communicating network export service quality: Final report*, 2022, p. 7.

			an independent party with qualitative research expertise.
N/A	DNSP engagement with solar retailers and installers	ECA proposed to include metrics that capture DNSP engagement with other parties that take part in delivering export services. This includes a qualitative metric to measure network communication to consumers, solar retailers and installers about export limits. It also includes reporting on rooftop solar system compliance (including inverter standards).	Do not include a specific item in the inaugural report. This would require ongoing monitoring and qualitative assessment that may be more suitable for a subsequent performance report. However, we are requesting contextual data on inverter compliance to include in the inaugural report.