Explanatory statement

Final decision

Pricing methodology guidelines: System strength pricing

25 August 2022

AUSTRALIAN ENERGY REGULATOR

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Overview

We, the Australian Energy Regulator (AER), work to make all Australian energy consumers better off, now and in the future. We regulate energy networks in all jurisdictions except Western Australia. Our work is guided by the National Electricity Objective which promotes efficient investment in, and operation and use of, electricity services in the long term interests of consumers.[1]

On 21 October 2021, the Australian Energy Market Commission (AEMC) made a final rule for the "Efficient management of system strength on the power system" rule change (system strength rule change).[2,3]

The AEMC's final rule requires us to modify the pricing methodology guidelines for two new requirements.[4] Specifically, the pricing methodology guidelines must specify or clarify:

- the permitted methodologies for determining the system strength unit price (SSUP**;** unit price) component of the system strength charge
- principles for determining forecast annual system strength revenue and estimated actual annual system strength revenue.

The pricing methodology guidelines set out the information a Transmission Network Service Provider (TNSP**;** transmission network) must provide to demonstrate that its proposed pricing methodology complies with the National Electricity Rules (NER**;** Rules).[5]

The amendments to the pricing methodology guidelines will be most relevant to transmission networks who are System Strength Service Providers (SSSP**;** system strength providers) under the new rule requirements. These are Transgrid, ElectraNet, Powerlink, TasNetworks and the Australian Energy Market Operator (AEMO).[6] However, the amendments will apply to all transmission networks and include some provisions that are relevant to transmission networks who are not system strength providers but who may have system strength connection points on their networks.

In accordance with the system strength rule change, we have made the following amendments to the pricing methodology guidelines.

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1 NEL, s. 7.

2 AEMC, *Rule determination: Efficient management of system strength*, 21 October 2021.

3 System strength is a quality of the power system reflecting a combination of fault current provision and the overall stability of the voltage waveform.

4 NER clause 6A.25.2(h). Note, clause 6A.25.2 sets out the required contents of the pricing methodology guidelines.

5 AER, *Pricing methodology guidelines*, 25 August 2022.

6 As part of its functions, AEMO is a Victorian electricity transmission network service provider.

- A system strength provider's proposed methodology for setting the unit price must be based on the long run average cost of providing system strength services at each system strength node (discussed in section 3.2).[7]
- System strength providers must use a period of at least 10 years when forecasting long run costs (discussed in section 3.1).[8]
- If the unit price is updated for indexation each year, the basis for indexation must be consistent with the approach for inflation indexation of the transmission network's maximum allowed revenue under its revenue determination. Where the system strength provider is AEMO, the system strength provider must propose a basis for indexation (discussed in section 4).[9]
- The pricing methodology guidelines set out high-level principles that system strength providers must be consistent with when determining forecast and estimated annual system strength revenues. The principles include that the methodologies used to forecast or estimate annual system strength revenues are reasonable and appropriate for their purpose. Further, these methodologies should utilise relevant existing information, such as connection agreements and applications to connect (discussed in section 5).[10]

The pricing methodology guidelines also set out the information to be included in or with a proposed pricing methodology to demonstrate compliance with the Rules and the pricing methodology guidelines.[11]

Note on acronyms and short forms

In this explanatory statement, we include both an acronym and a short form in parenthesis after the first use of certain terms. We include the acronym to indicate consistency with terms defined in the Rules and associated determination documents. However, we generally use the short form in this explanatory statement for readability.

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7 AER, *Pricing methodology guidelines*, 25 August 2022, paragraph 2.7(a)(1).
8 AER, *Pricing methodology guidelines*, 25 August 2022, paragraph 2.7(a)(2).
9 AER, *Pricing methodology guidelines*, 25 August 2022, paragraph 2.7(a)(1).
10 AER, *Pricing methodology guidelines*, 25 August 2022, paragraph 2.8.
11 AER, *Pricing methodology guidelines*, 25 August 2022, paragraph 2.1.

1 Introduction

1.1 Objective and scope of this explanatory statement

Our approach to amending the pricing methodology guidelines must advance the National Electricity Objective,[12] deliver on the new guidance requirements in Rules clauses 6A.25.2(h) and 6A.25.2(i), and meet the requirements of the transmission consultation procedures.[13] The pricing methodology guidelines must also give effect to and be consistent with the Pricing Principles for Prescribed Transmission Services (pricing principles),[14] including the new principles applicable to system strength services which have been inserted by the system strength rule change.

This explanatory statement accompanies our amendments to the pricing methodology guidelines for the new system strength requirements. It explains our approach to consulting on these amendments, how we have taken into account the relevant Rules requirements, our approach to incorporating the amendments into the guidelines, and outcomes of our analysis and engagement on key issues relating to these amendments.

This explanatory statement should be read in conjunction with the pricing methodology guidelines we published on 25 August 2022 (final guidelines). To assist stakeholders, we have published a marked-up version of the final guidelines to show the changes from the draft pricing methodology guidelines we published in June 2022 (draft guidelines). As part of this process, we also amended the pricing methodology guidelines for minor consequential changes, corrections and cross-referencing updates.

1.2 Consultation process

To meet the 31 August 2022 due date[15] for amending the pricing methodology guidelines, we consulted with stakeholders in accordance with the transmission consultation procedures.[16]

To initiate the review, we published a consultation paper in March 2022 seeking stakeholder comment on key issues in making amendments to the pricing methodology guidelines. We also held a public forum in April 2022 to provide stakeholders opportunity to engage, ask questions and provide verbal input into this process. The forum was attended by 21 stakeholders and our advisors farrierswier.

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12 NEL, s. 7.
13 NER, cl. 6A.20
14 NER, cl. 6A.25.1(b)
15 NER clause 11.143.4.
16 NER, cl. 6A.20

We received four written submissions to the consultation paper on 26 April 2022. These submissions are available on our website.[17]

We published our draft guidelines on 2 June 2022, which incorporated stakeholder feedback from these four submissions and the public forum. The explanatory statement that accompanied our draft guidelines (draft decision explanatory statement) set out our detailed consideration of this stakeholder feedback.[18]

We received two written submissions to our draft guidelines (including one late submission). These submissions are available on our website.[19]

We published our final guidelines on 25 August 2022, incorporating stakeholder feedback from these two submissions. This explanatory statement sets out our detailed consideration of this stakeholder feedback.

Table 1.1 summarises our consultation process.

Table 1.1 Project milestones

Date	Milestone
Completed milestones	
22 March 2022	AER published a Consultation Paper
8 April 2022	AER held a public stakeholder forum (online)
26 April 2022	Four submissions to Consultation Paper received
2 June 2022	AER published the Draft Pricing Methodology Guidelines
15 July 2022	One submission to Draft Pricing Methodology Guidelines received
29 July 2022	One late submission to Draft Pricing Methodology Guidelines received
25 August 2022	AER published the Final Pricing Methodology Guidelines

1.3 Structure of this explanatory statement

The rest of this explanatory statement is structured as follows:

- Section 2 outlines key elements of the AEMC's final rule and summarises the scope of the amendments to our pricing methodology guidelines required by the final rule.
- Section 3 explains our final decision on pricing based on long run costs.

17 https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/system-strength-pricing/initiation

18 https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/system-strength-pricing/draft-decision

19 https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/system-strength-pricing/draft-decision

- Section 4 explains our final decision on annual inflation indexation.
- Section 5 explains our final decision on the principles for revenue forecasting.
- Section 6 explains our final decision on the information required to be included in a proposed pricing methodology to demonstrate compliance with the relevant regulatory requirements.
- Section 7 discusses other issues that were raised in submissions but are not addressed in our final guidelines.

1.4 Key terms used in this explanatory statement

Table 1.2 sets out the key terms we use in this explanatory statement.

Table 1.2 Key terms used in this paper

Term	Explanation
Long-run average cost (LRAC; average cost)	See section 3.2.2.
Long-run marginal cost (LRMC; marginal cost)	See section 3.2.2.
System strength charge	The system strength charge is the charge payable by system strength transmission service users to a system strength service provider for system strength services. It is calculated as explained in appendix B.1.4 and has three components: the system strength unit price (SSUP; unit price), system strength locational factor (SSL; locational factor) and system strength quantity (SSQ).
System strength service provider (SSSP; system strength provider)	System strength providers are defined in the Rules clause 5.20C.3 as either the transmission network for the region, or where there is more than one transmission network for a region, they are the jurisdictional planning body for that region. In the instance that the jurisdictional planning body is not a transmission network, then the coordinating transmission network service providers for that region will be the system strength provider for the region. The transmission networks that are currently system strength providers are ElectraNet in South Australia, Powerlink in Queensland, TasNetworks in Tasmania, Transgrid in NSW and AEMO in Victoria.
System strength unit price (SSUP; unit price)	The unit price is a key component of the system strength charge. It is the unit price (in $/MVA per year) for system strength services provided by a system strength provider at a system strength node. It is fixed for the system strength charging period, which is usually five years.

2 Background: Implementing system strength pricing

This section outlines key elements of the AEMC's final rule and summarises the scope of the amendments to the pricing methodology guidelines as required by the final rule.

Appendix B describes the rule change and the required amendments to the pricing methodology guidelines in more detail.

2.1 The system strength rule change

2.1.1 Background to the system strength rule change

AEMO currently defines system strength as:[20]

> *"the ability of the power system to maintain and control the voltage waveform at any given location in the power system, both during steady state operation and following a disturbance."*

A decline in system strength in the National Electricity Market (NEM) has been noticed over the last several years as inverter-based generation replaces synchronous generation output.

2.1.2 Key elements of the AEMC's final rule

On 21 October 2021, the AEMC made a final rule establishing a new framework to facilitate the proactive provision of system strength where it is needed in the network.[21]

The final rule implemented an approach that coordinates the supply and demand of efficient levels of system strength. Implementing the above reforms involves key actions by participants and market bodies including the AER, AEMO, system strength providers and other electricity networks.

A key finding of the rule making process was that transmission networks were best placed to identify options for system strength provision and to leverage economies of scale for efficient delivery of those options. One transmission network in each NEM region is designated as the system strength provider for that region.

The final rule implemented a three-part approach to providing efficient levels of system strength as summarised in the following illustration.

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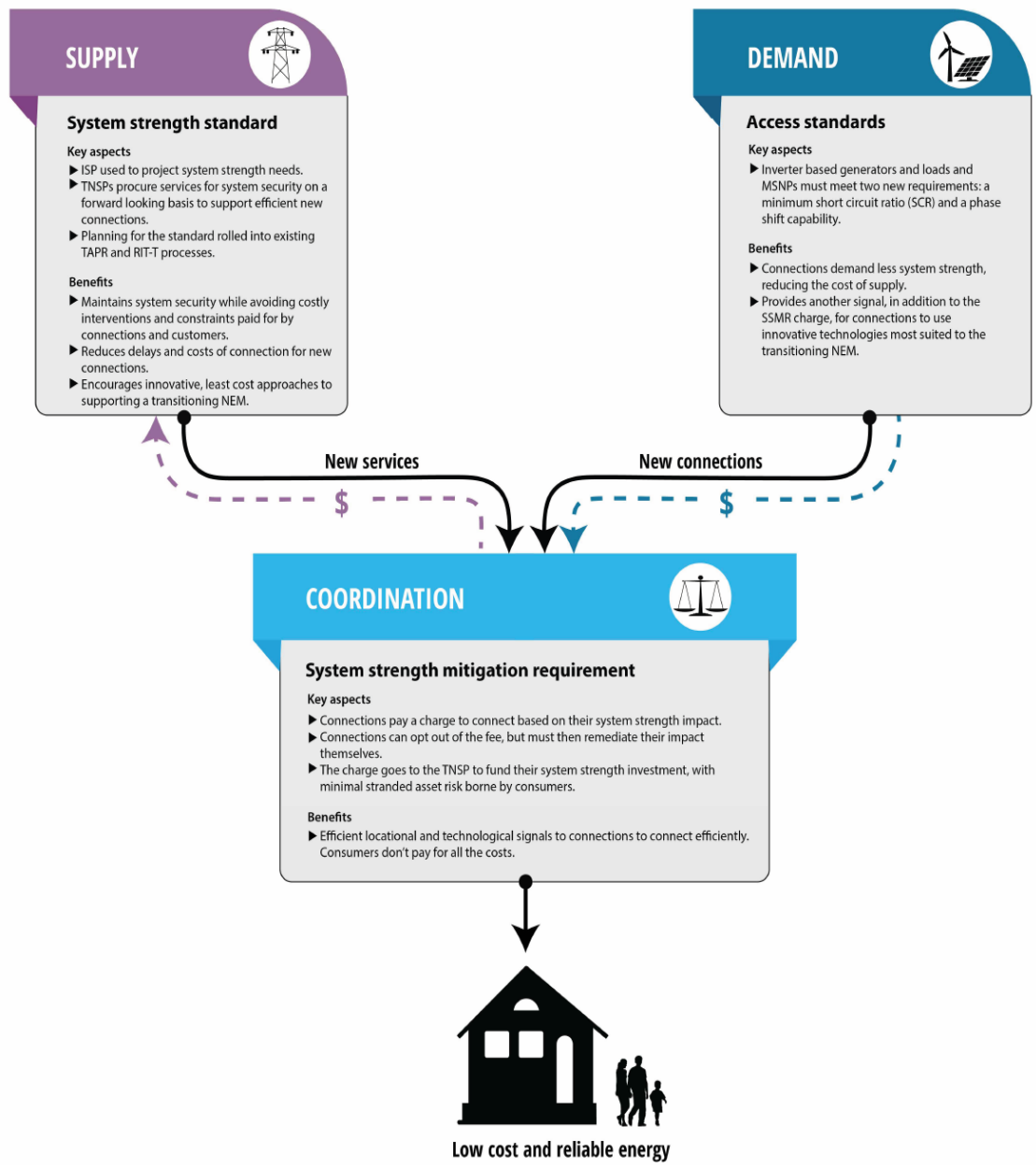
[20] AEMO, *Amendments to AEMO instruments for Efficient Management of System Strength Rule, Issues Paper,* April 2022, p. 8.

[21] AEMC, *Rule determination: Efficient management of system strength*, 21 October 2021.

Figure 2.1 Overview of the system strength framework in the final rule



Source: AEMC, *Rule determination: Efficient management of system strength*, 21 October 2021, p.14.

2.1.3 Final rule requirements for the pricing methodology guidelines

The final rule requires connecting plants to pay for the costs of 'consuming' the system strength service from system strength providers. Connecting plants would pay a charge based on the long run costs of providing system strength services. This charge is made up of several components including a unit price.

The final rule requires us to update our pricing methodology guidelines and set out the permitted methodologies for determining the unit price. The system strength providers

will then set the unit price in accordance with their pricing methodology, which in turn must comply with our pricing methodology guidelines and the Rules.

We discuss this issue further in section 3.

The final rule also requires us to include in our pricing methodology guidelines the principles for determining forecast and estimated annual system strength revenue. These are inputs to the true-up process to account for differences between forecast, estimated and actual annual system strength revenues.

We discuss this issue further in section 5.

Our pricing methodology guidelines must also give effect to and be consistent with the pricing principles.[22] The final rule made a number of amendments to the pricing principles in relation to system strength services.

Generally, the amendments made to the pricing principles reflected that system strength transmission services are a prescribed common transmission service, and that system strength service payments are to be treated in the same way as operating and maintenance costs expected to be incurred in the provision of prescribed common transmission services.

The relevant pricing principles which were inserted by the final rule include that:

- The annual service revenue requirement for prescribed common transmission services is to be adjusted by adding system strength service payments (to the extent that those costs or payments were subtracted from the maximum allowed revenue in accordance with clause 6A.22.1);[23]
- In addition to this adjustment, for a transmission network who is a system strength provider, the annual service revenue requirement for prescribed common transmission services for a regulatory year must be adjusted by subtracting the transmission network's forecast of its annual system strength revenue for that year, and adding or subtracting any adjustment arising from the application of clause 6A.23.3A(b);[24]
- A transmission network who is a system strength provider must determine a forecast of its annual system strength revenue for a year, as well as an estimate of its actual annual system strength revenue for the previous year and its actual annual system strength revenue for year t–2 (applying the principles in the pricing methodology guidelines). The calculation of the annual service revenue requirement for prescribed common transmission services for the year is to be in accordance with clause 6A.23.3A(b); [25]

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22 NER, cl. 6A.25.1(b)

23 NER, cl. 6A.23.3(h)

24 NER, cl. 6A.23.3A(b)

25 NER, cl. 6A.23.3A

- The transmission network must have separate prices for system strength transmission services; [26] and
- Prices for or in respect of system strength transmission services must be determined in accordance with the system strength charge structure set out in clause 6A.23.5 or clause 6A.23.6 (pass through charge), as applicable. [27]

We consider our final guidelines give effect to and are consistent with the pricing principles.

[26] NER, cl. 6A.23.4(a)(6)

[27] NER, cl. 6A.23.4(h), 6A.23.25, 6A.23.26

3 Pricing based on long run costs

This section explains areas we have consulted on and reflected in the final guidelines that relate to estimating long run costs.

3.1 Guidance on what constitutes long run

3.1.1 Final decision

We have reflected a 10 year minimum period for forecasting "long run" costs (see section 2.7(a)(2) of the final guideline).

3.1.2 Reasons for final decision

We consider specifying a minimum of 10 years is appropriate. As we noted for distribution pricing, there is no ideal or correct timescale that defines "long run". However, the timescale must be long enough to allow a significant number of factors of production to change. We consider a minimum of 10 years captures the essence of "long run".[28]

Our consultation paper[29] explained how long run cost pricing is different to existing transmission pricing methodologies, as well as various issues and options associated with identifying a long-term forecasting horizon.

The draft decision explanatory statement set out how stakeholder feedback supported guidance specifying a minimum period for "long run" of 10 years.[30]

We received no further submissions on this topic in response to the draft guidelines.

3.2 Permissible long run cost concepts

3.2.1 Final decision

We have set out that long run average cost will be the permitted long run pricing methodology for determining unit prices (section 2.7(a)(1) of the final guidelines).

3.2.2 Reasons for final decision

[28] AER, *Draft Decision: SA Power Networks Distribution Determination 2020 to 2025: Attachment 18: Tariff structure statement*, October 2019, pp. 34–35.

[29] At section 4.1.

[30] At section 3.1.

Our consultation paper[31] identified that our guidelines may need to adopt either or both of the long run economic cost concepts (marginal cost and/or average cost) commonly used in regulated infrastructure pricing.

We consider establishing average cost as the permitted methodology for determining the unit price is consistent with the requirements of the Rules.[32] We consider the average cost method:

- provides efficient investment and utilisation signals for system strength transmission services. This is because the average cost method:
    - results in stable pricing across system strength charging periods. This in turn would support investor confidence and more optimal location decisions.
    - allocates more of the costs of providing system strength transmission services to the parties that require those services. This in turn reduces the costs to be recovered from customers via prices for prescribed common transmission services.
- will be simpler to administer than the marginal cost method because it uses information that is more readily available.

Feedback from our stakeholder forum and written submissions to the consultation paper and draft guidelines identified a common preference for adopting the average cost method in our pricing methodology guidelines.[33] No stakeholders supported using marginal cost.

The draft decision explanatory statement discussed our reasons in greater detail.

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31 At section 4.2.

32 NER, cl. 6A.25.2(h).

33 AEC, *Submission on pricing methodology guidelines 2022 consultation paper*, 26 April 2022, p.2; ENA, *Submission on pricing methodology guidelines 2022 consultation paper*, 26 April 2022, pp.1 and 4; CS Energy, *Submission on pricing methodology guidelines 2022 consultation paper*, 26 April 2022, p.2; EnergyAustralia, *Submission on pricing methodology guidelines 2022 consultation paper*, 26 April 2022, p.3; ENA, *Submission on draft amendments to pricing methodology guidelines (system strength pricing)*, 15 July 2022, p.1.

4 Annual indexation

4.1 Final decision

Our final decision makes provision for the unit price to be updated for indexation for each regulatory year in the system strength charging period (see section 2.7(b) of the final guidelines). It requires that the basis for indexation is:

- set out in the transmission network's pricing methodology
- consistent with the approach used for annual inflation indexation of the transmission network's maximum allowed revenue under its revenue determination. Where the transmission network does not have a revenue determination, the transmission network must propose a basis for indexation.

4.2 Reasons for final decision

The unit price is fixed for the system strength charging period (usually five years) unless the pricing methodology guidelines allow annual indexation for inflation.

We consider that maintaining unit prices in real terms is appropriate. It will prevent the real share of the system strength provider's revenues from system strength charges declining relative to other prescribed transmission services for reasons not related to demand for system strength services.

Submissions to our consultation paper and draft guidelines supported annual indexation. Further, such indexation should be consistent with the annual inflation indexation of the maximum allowed revenue determined in a transmission network's revenue determination.[34]

AEMO's submission to our draft guidelines identified that its current approved pricing methodology for 2022–27 does not contain provisions for indexation. Further, AEMO does not have a revenue determination. AEMO therefore suggested the pricing methodology guidelines should include provisions that consider its circumstances.[35]

We acknowledge these circumstances and consider they should not prevent AEMO from including indexation of unit prices for system strength services. Our final guidelines therefore require AEMO to propose a basis for such indexation in its pricing methodology.[36]

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34 ENA, *Submission on draft amendments to pricing methodology guidelines (system strength pricing)*, 15 July 202, p. 2; AEC, *Submission on pricing methodology guidelines 2022 consultation paper*, 26 April 2022, p.2; EnergyAustralia, *Submission on pricing methodology guidelines 2022 consultation paper*, 26 April 2022, p.5.

35 AEMO, *Submission on draft amendments to pricing methodology guidelines (system strength pricing)*, 29 July 2022, p.1.

36 AER, *Pricing methodology guidelines*, 25 August 2022, paragraph 2.7(b)(2).

5 Revenue forecasting

This section explains areas we have consulted on and reflected in the final guidelines relating to forecasting/estimating system strength revenues.

5.1 Guidance on annual system strength revenue inputs

5.1.1 Final decision

Our final decision requires that system strength providers' proposed methodologies for determining forecast annual system strength revenue and estimated actual annual system strength revenue must give effect to, and be consistent with, the principles in section 2.8 of the final guidelines. These principles include that:

(1) the methodologies should be reasonable and appropriate for their purpose.

(2) the cost of implementing the methodologies should be proportionate to the expected level of materiality of the impact of inaccuracy in estimates or forecasts.

(3) the methodologies should utilise relevant existing information to the extent possible.

5.1.2 Reasons for final decision

Each year the system strength providers' pricing methodologies will rely upon system strength revenue inputs to apply a true-up process to account for differences between forecast, estimated and actual annual system strength revenues under rule 6A.23.3A.

Our consultation paper and public forum explored the purpose and consequences of accuracy in these revenue inputs under a transmission network's revenue cap, and outlined relevant principles for guidance on these inputs. This principles-based approach was supported by stakeholders.[37]

Our draft guidelines adopted high-level principles on this issue rather than prescriptive requirements. We identified that any difference between estimated or forecast system strength revenue and actual system strength revenue is unlikely to have a material impact on overall transmission prices for customers. This is because the size of system strength revenue relative to the transmission network's total maximum allowed revenue is likely to be small.

We did not receive any submissions on this issue. Our final guidelines therefore retain the principles in the draft guidelines.

[37] Stakeholders in the public forum supported principled rather than prescriptive revenue input guidance. EnergyAustralia, *Submission on pricing methodology guidelines 2022 consultation paper*, 26 April 2022, p.5.

6 Information requirements

6.1 Guidance on information required to be included in a proposed pricing methodology

6.1.1 Final decision

Our final guidelines set out the information a transmission network must include in its proposed pricing methodology to demonstrate that it complies with the Rules and guidelines (see section 2.1(j) to (l) of the final guidelines).

As we discuss in sections 6.1.2.1 and 6.1.2.2, we have added a new subclause 2.1(l)(3) in response to issues raised in ENA's and AEMO's submissions. We also made a minor amendment to clause 2.1(k)(1) from the draft guidelines for greater clarity regarding the application of system strength charges (see section 6.1.2.3).

We also retain a number of minor consequential changes to section 2.1 of the guidelines as consulted on in our draft guidelines.

6.1.2 Reasons for final decision

Section 2.1 of our guidelines lists the information a transmission network must include in its proposed pricing methodology.

In our draft guidelines, we updated this section to include the information a transmission network must include in its proposed pricing methodology to demonstrate compliance with new system strength requirements.[38]

This guidance is relevant to system strength providers and also to transmission networks who are not system strength providers.

The information requirements applying to system strength providers are based on the various new requirements applying to them under the Rules as well as the long run costs, indexation and revenue forecasting aspects of our guidelines discussed above.

The information requirements applying to transmission networks who are not system strength providers relate to the new Rules requirement that their pricing methodology must provide for a charge for each system strength connection point on their transmission network. These charges would recover on a pass through basis the annual system strength charge determined by the relevant system strength provider.[39]

ENA and AEMO commented on several aspects of the information requirements in their submissions to the draft guidelines. We detail these issues and their implications for our final guidelines in the subsections below.

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[38] In particular, paragraphs 2.1(j) to (l).

[39] NER clause 6A.23.6(b).

6.1.2.1 Requirements for AusNet Services

Section 2.1(l) of the draft guidelines required transmission networks who are not the system strength providers for their region to explain how they will set charges for each system strength connection point on their networks.

AEMO noted it is responsible in Victoria for jurisdictional planning, management of the connection process, quoting and charging for the provision of system strength services and recovering prescribed transmission services costs. AEMO therefore considered the proposed paragraph 2.1(l) in the draft guidelines would not apply to AusNet Services.[40] ENA also submitted this view.[41]

We agree the requirements in paragraph 2.1(l) should not apply to AusNet Services given AEMO is responsible for these matters in Victoria. The final guidelines therefore contain a new paragraph 2.1(l)(3)(A). This states that the information requirements set out in paragraphs 2.1(l)(1) and (2) do not apply to a transmission network in an adoptive jurisdiction[42]: that is, any transmission network in Victoria (at the time of writing).

For this reason, ENA also submitted that we should make clear that AusNet Services is not required to submit a revised pricing methodology by 30 November 2022.[43]

The Rules require AusNet Services to submit a revised pricing methodology by that date so we cannot remove that requirement in our final guidelines.[44] Parts of AusNet Services' current pricing methodology explains how responsibility for pricing is allocated between AEMO and AusNet Services in Victoria. We consider it is useful for AusNet Services to submit a revised pricing methodology that is amended for consistency with AEMO's revised pricing methodology. This will help transmission users understand who is responsible for system strength charges in Victoria. We do not consider any other amendments will be required.

6.1.2.2 Requirements for Directlink and Murraylink

ENA submitted that our draft decision explanatory statement did not mention Directlink and Murraylink, despite these two interconnectors being mentioned in the AEMC's final determination. ENA sought clarification that they do not need to submit a revised pricing methodology.[45]

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40 AEMO, *Submission on draft amendments to pricing methodology guidelines (system strength pricing)*, 29 July 2022, p. 2.

41 ENA, *Submission on draft amendments to pricing methodology guidelines (system strength pricing)*, 15 July 2022, p. 3.

42 "Adoptive jurisdiction" has the meaning given in the NEL (NER, chapter 10).

43 ENA, *Submission on draft amendments to pricing methodology guidelines (system strength pricing)*, 15 July 2022, p. 3.

44 NER clause 11.143.5(a) and the definition of 'applicable TNSP' in clause 11.143.1

45 ENA, *Submission on draft amendments to pricing methodology guidelines (system strength pricing)*, 15 July 2022, p. 4.

We agree the Rules do not require Directlink and Murraylink to submit amended pricing proposals in November 2022.[46] They are treated differently to other transmission networks on the basis that they are not expected to have any system strength connection points on their networks.

For clarity, the final guidelines contain a new paragraph 2.1(l)(3)(B). This states that section 2.1(l) does not apply to a transmission network that can establish it is unlikely to have system strength connection points on its transmission network during the system strength charging period.

Hence, the pricing methodologies of Murraylink and Directlink will not need to address system strength charges provided they have no system strength connection points on their networks. This would also apply to transmission networks in a similar situation (existing and prospective).

6.1.2.3 Clarification regarding the application of the system strength charge

We have also made a minor wording change in our final guideline to clarify how system strength providers set charges for system strength connection points that are not located on their transmission network. This change is to delete the words 'on its transmission network' that were included in clause 2.1(k)(1) of the draft guideline.

We made this change because some system strength connection points may not be located on the system strength provider's transmission network. Instead, they may be located on a distribution or transmission network that is connected to the system strength provider's network. In those circumstances, the system strength provider will invoice the distribution network or other transmission network for system strength charges. The distribution network or other transmission network will then pass on to the relevant user in accordance with clause 6.20.3A (for distribution networks) or 6A.23.6 (for other transmission networks).

6.1.2.4 November 2022 system strength pricing methodologies

ENA submitted that the proposed information requirements included in clause 2.1 of the draft guidelines are reasonable.

However, ENA noted timing challenges associated with their first application.

ENA pointed to the limited timeframe between the publication of our final guidelines and the 30 November 2022 deadline for relevant transmission networks to submit their proposed pricing methodologies. In addition, AEMO must update a number of system strength guidelines and will only publish its first system strength report on 1

[46] See NER clause 11.143.5(a) and the definition of 'applicable TNSP' in clause 11.143.1.

December.[47] We note AEMO's guidelines and reports are an input into the development of unit prices and system strength charges.

We acknowledge the timing challenges ENA discussed in its submission. Hence, we encourage transmission networks to engage with us as they develop their proposed pricing methodologies.

We noted these timing challenges in our consultation paper as among a range of reasons that may require the approach to system strength charging to evolve over time.

Recognising these considerations, the final guidelines do not take a highly prescriptive approach. System strength providers will have flexibility to adjust their approach between successive five year system strength charging periods. This will enable them to adapt as more information becomes available about the costs and demand for system strength services and as technology for system strength services evolves. We may also review our guidelines in future if needed.

We note ENA stated it will be working with interested transmission networks to develop commonality to the extent practical in the proposed pricing methodologies.[48]

We support such coordination, particularly in the first tranche of proposed pricing methodologies due on 30 November 2022. The central provision of system strength services is a new requirement in the NEM. Hence, there is considerable uncertainty regarding the demand, costs and pricing for such services in the short to medium term.

A common approach to system strength pricing—to the extent practical—developed in coordination with other transmission networks is one avenue for transmission networks to share knowledge and ideas and so mitigate some of this uncertainty. Transmission networks can modify the system strength aspects of future pricing methodologies to their unique circumstances (if needed) as they gain more experience in providing system strength services.

We also encourage transmission networks to engage with us prior to submitting their proposed pricing methodologies by 30 November 2022. We consider such engagement is consistent with the Rules. In particular, clause 11.143.53(f) requires the AER and the relevant transmission networks to cooperate with each other so that we can publish our final decisions on the proposed pricing methodologies by 31 January 2023.[49]

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47 NER clause 11.143.5 requires each 'applicable transmission network' and AEMO to submit a proposed amended pricing methodology by this date. The applicable transmission networks are defined as Ausgrid, AusNet Services, ElectraNet, Powerlink, TasNetworks and Transgrid.

48 ENA, *Submission on draft amendments to pricing methodology guidelines (system strength pricing)*, 15 July 2022, p. 4.

49 NER, cl. 11.143.5(f).

This could mean involving us in discussions organised by ENA (as mentioned above) or submitting to us draft versions of the proposed pricing methodologies, or parts thereof. Such engagement would enable us to provide feedback where appropriate. It would also signal to us the likely direction the proposed pricing methodologies will take. Early engagement should provide efficiencies in our formal assessment in making our final decisions by 31 January 2023, and when transmission networks publish unit prices by 15 March 2023.

ENA also noted that Ausgrid and TasNetworks are required to provide a proposed pricing methodology to the AER by 30 November 2022. The AER must then make a decision on these proposed pricing methodologies by 31 January 2023.

Parallel to this process, ENA pointed out that Ausgrid and TasNetworks must also submit their proposed pricing methodologies for the next regulatory control period by 31 January 2023.[50]

We acknowledge the apparent challenge of these timelines. However, we do not consider this timing will impede these networks from meeting the rule requirements.

For Ausgrid and TasNetworks, we will be cognisant of the timing issues they face when we assess the pricing methodologies they submit as part of their regulatory proposals for the 2024–29 regulatory control periods. We will assess those pricing methodologies as part of the normal course of our regulatory determination processes. These processes include the making of a draft regulatory determination in September 2023.[51] Ausgrid and TasNetworks can respond to our draft determinations in their revised pricing methodologies, which we will assess when making our final regulatory determinations (due April 2024).[52]

6.1.2.5 Scope of information requests outside the pricing methodology guidelines

ENA questioned our proposal in the draft decision explanatory statement to use our other information-gathering powers to seek the model(s) utilised to determine unit prices. ENA stated the AER is approving the methodology to calculate unit prices and not the unit prices themselves.[53]

Our draft decision explanatory statement explained that in a separate process prior to submission, we will request system strength providers to include in their proposals additional information that supports their proposed pricing methodology. We foreshadowed that such information may include:

- sources for cost and demand forecasts for system strength services

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50 ENA, *Submission on draft amendments to pricing methodology guidelines (system strength pricing)*, 15 July 2022, p. 3.

51 AER, *Regulatory determination timetable*, June 2022.

52 AER, *Regulatory determination timetable*, June 2022.

53 ENA, *Submission on draft amendments to pricing methodology guidelines (system strength pricing)*, 15 July 2022, p.2.

- the model(s) utilised to determine the system strength unit price for each system strength node on its transmission network for the system strength charging period
- reports, including consultant reports.

We agree with ENA that information requests for data relating to system strength services need to be commensurate with the value of the service within the overall prescribed transmission charges. We also agree that we should be cognisant of time and information availability limitations, particularly when making our decision regarding the first tranche of proposed pricing methodologies due by 30 November 2022.[54]

We will therefore take a practical approach regarding the information we request from transmission networks when assessing their proposed pricing methodologies.

In the first tranche of proposed pricing methodologies, for example, we may request a system strength provider to submit simplified models to support its proposed pricing methodology. We may request that such models illustrate the mechanics of the system strength provider's proposed methodology for determining unit prices using example data. This may assist our assessment of the proposed pricing methodology against the requirements of the Rules and our final guidelines in the first tranche.

When assessing future proposed pricing methodologies, we may request a system strength provider to submit the actual models they propose to use to set unit prices. Such models may assist our assessment of the proposed pricing methodology against the requirements of the Rules and our final guidelines as system strength providers gain more experience and knowledge in providing this service.

We also acknowledge ENA's submission that such models may be quite detailed.[55] However, we do not consider this should be a barrier to providing such models for our assessment in future processes. After all, we require system strength providers to determine unit prices using long run average cost because of that method's relative simplicity (see section 3.2). For comparison, distribution networks have been submitting to us the models they use to determine the long run marginal cost estimates for their tariff structure statements. It is therefore unclear why system strength providers could not do the same in future processes.

Where provision of such models is impractical due, for example, to size, we will work with the relevant system strength provider to address such issues.

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54 ENA, *Submission on draft amendments to pricing methodology guidelines (system strength pricing)*, 15 July 2022, p.2.

55 ENA, *Submission on draft amendments to pricing methodology guidelines (system strength pricing)*, 15 July 2022, p.2.

7 Issues not addressed in the guidelines

This section explains matters raised in submissions to the draft guidelines that we do not consider require further guidance in the final guidelines.

7.1 Treatment of new nodes within a system strength charging period

In responding to the draft decision, ENA and AEMO sought clarity on the treatment of new system strength nodes established during a system strength charging period.[56]

We acknowledge that AEMO may introduce new nodes within a five year system strength charging period. AEMO's annual system strength report must provide information on any new system strength nodes that have been declared, an indication of possible future nodes and when AEMO considers any future nodes may be declared.[57] AEMO must publish this report by 1 December each year.[58]

The Rules provide that, for the purposes of system strength providers' planning obligations under clause S5.1.14, new nodes take effect three years after they are declared.[59] The Rules do not expressly address when new nodes take effect for pricing purposes.

This creates the potential for a new node to be created and take effect within the duration of a system strength provider's approved pricing methodology. If that occurred, the system strength provider would need to calculate a new unit price for the new node, based on the methodology set out in its approved pricing methodology.

We consider the final guidelines adequately provide for this occurrence.

When we review and approve a system strength provider's proposed pricing methodology, we approve the system strength provider's *methodologies* for calculating the unit price at each system strength node. We are not approving the *unit prices* themselves. There is no requirement for the pricing methodology to set out the location of each system strength node or the amount of the unit price for each node. The system strength provider can set the unit price for a new node declared by AEMO during the system strength charging period in accordance with its approved pricing methodology.

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56 ENA, *Submission on draft amendments to the pricing methodology guidelines: system strength pricing*, 15 July 2022, p.2. AEMO, *Submission on draft amendments to the system strength pricing methodology guidelines*, 29 July 2022, p.2.

57 NER, cl. 5.20.7(e).

58 NER, cl. 5.20.7.

59 See the example in NER clause S5.1.14(a).

This process of setting the amount of the unit price for each node will occur as part of the annual transmission pricing process under clause 6A.24.2 of the Rules.[60] We consider the declaration of new nodes can be accommodated within this annual pricing process.

If a new node is declared by AEMO, the system strength provider must calculate and publish the unit price for that new node in its next annual transmission prices. If AEMO declares a new node in its system strength report on 1 December, the relevant system strength provider would publish the unit price for that new node in its next transmission prices by 15 March the following year.

This is equivalent to how approved pricing methodologies can currently account for the addition of new transmission connection points. That is, a transmission network will set prescribed transmission services prices for a new connection point established during a regulatory control period in accordance with its approved pricing methodology.

7.2 Requirements for Renewable Energy Zone Network Operators

ENA noted the NSW Roadmap may introduce Renewable Energy Zone (REZ) Network Operators and these new entities may be registered transmission networks in the NEM. ENA submitted it may be useful for the final guidelines to clarify the impacts on transmission networks that may have obligations under Chapter 5 of the NER but are not economically regulated under Chapter 6A. ENA also proposed that our final guidelines clarify 'the obligations for Transgrid in these new REZs given the varied planning arrangements'.[61]

We have not addressed in our final guideline any issues related to operators of NSW REZ networks regulated under the *Electricity Infrastructure Investment Act 2020* (NSW) (NSW EII Act). We consider it is premature for us to express a view on how any new entities under that framework would be regulated given those regulatory arrangements are under development by the NSW government at the time of writing. However, we note that based on materials published by the NSW Office of Energy and Climate Change (OECC):

- pricing matters related to these projects will governed by the NSW EII Act and they will not be subject to the transmission pricing provisions in Chapter 6A of the NER,[62] which means our pricing methodology guidelines would not apply;

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60 See NER clause 6A.24.2(d), which requires that as part of this annual pricing process the SSSP must publish the SSUP for each system strength node on its transmission network, updated for indexation if applicable.

61 ENA, *Submission on draft amendments to the pricing methodology guidelines: system strength pricing*, 15 July 2022, p.4

62 OECC, *Regulatory framework for the Transmission Efficiency Test and Regulator's determinations for network infrastructure projects, Policy Paper,* April 2022, p. 15.

- arrangements for the provision of system strength are currently being consulted on as part of the design of the access scheme for the first REZ under this framework – the Central-West Orana (CWO) REZ.[63]

[63] OECC, *CWO REZ Access Rights and Scheme Design*, July 2022, pp38-39.

A Acronyms and shortened forms

Shortened form	Extended form
AEC	Australian Energy Council
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
DNSP	Distribution network service provider
ENA	Energy Networks Australia
IBR	Inverter based resources
LRAC; average cost	Long-run average cost
LRMC; marginal cost	Long-run marginal cost
MAR	Maximum allowed revenue
MVA	Megavolt amperes
MW	Megawatt
NEL	National electricity law
NEM	National electricity market
NER	National electricity rules
TNSP; transmission network	Transmission network service provider
SSIAG	System strength impact assessment guidelines
SSL; locational factor	System strength locational factor
SSSP; system strength provider	System strength service provider
SSQ	System strength quantity
SSUP; unit price	System strength unit price

B Background

This section:

- Outlines key elements of the AEMC's final rule and how it interacts with existing transmission pricing, and describes key terms used in this paper.
- Explains the scope of the amendments to our guidelines that are required by the system strength rule change.
- Identifies interdependencies with tasks being done by AEMO and tasks required of affected transmission networks.

B.1 The system strength rule change

B.1.1 Background to the rule change

Historically, fault level (measured in MVA) in the electricity power system has been used as the proxy unit of measurement for system strength. However, this only captures one aspect of system strength. AEMO currently defines system strength as:[64]

> *"the ability of the power system to maintain and control the voltage waveform at any given location in the power system, both during steady state operation and following a disturbance."*

A decline in system strength in the National Electricity Market (NEM) has been noticed over the last several years as inverter-based generation replaces synchronous generation output.

B.1.2 Key elements of the AEMC's final rule

On 21 October 2021, the AEMC made a final rule establishing a new framework to facilitate the proactive provision of system strength where it is needed in the network.[65] A key finding of the rule making process was that transmission networks were best placed to identify options for system strength provision and to leverage economies of scale for efficient delivery of those options. One transmission network in each NEM region is designated as the system strength provider for that region.

The final rule implemented a three-part approach to providing efficient levels of system strength (summarised earlier in Figure 2.1).

Implementing the above reforms involves the following key actions by participants and market bodies:

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64 AEMO, *Amendments to AEMO instruments for Efficient Management of System Strength Rule, Issues Paper,* April 2022, p. 8.

65 AEMC, *Rule determination: Efficient management of system strength*, 21 October 2021.

- **AER:** will update the transmission pricing methodology guidelines, and review and assess cost recovery applications via the existing processes (including revenue determinations, contingent projects and pass throughs).
- **AEMO:** will update its system strength impact assessment guidelines (SSIAG**;** impact assessment guidelines) and its system strength requirements methodology and publish an annual system strength report. In accordance with these documents, AEMO will:
    - specify the number and location of system strength nodes
    - forecast the future IBR connections for each system strength node
    - set the three-phase fault level required for a secure system at each node.
- **System strength providers:** will need to update their transmission annual planning reports for their plans to meet the system strength standard, seek AER cost recovery for their planned activities to meet the standard, and update their pricing methodologies to include system strength pricing.
- **Transmission networks and distribution networks who are not system strength providers:** must implement the system strength charges from the system strength provider for their region to connections on their networks who face the system strength charge, including:
    - Transmission networks who are not system strength provider but who have system strength connection points on their network (i.e. Ausgrid and AusNet Services) will need to submit updated pricing methodologies to the AER by 30 November 2022.
    - Distribution networks' pricing proposals from 2023 onwards must explain how they will pass through system strength charges in a manner that replicates the amount, structure and timing of the relevant system strength provider's system strength charge as far as is reasonably practicable.[66]

B.1.3 Final rule requirements for the pricing methodology guidelines

The final rule requires connecting plants to pay for the costs of 'consuming' the system strength service that system strength providers provide. Connecting plants would do this by paying a charge based on the long run costs of providing system strength services. This charge is intended to better coordinate the supply and demand of system strength by efficiently charging the parties for their use of centrally supplied system strength. This charge is made up of several components as explained below including the unit price.

[66] NER clause 6.18.2(b)(6C).

The final rule requires us to update our pricing methodology guidelines and set out the permitted methodologies for determining the unit price. The system strength providers will then set the unit price in accordance with their pricing methodology, which in turn must comply with our pricing methodology guidelines.

The final rule also requires us to include in our pricing methodology guidelines the principles for determining forecast annual system strength revenue and estimated actual annual system strength revenue. These are inputs to the true-up process to account for differences between forecast, estimated and actual annual system strength revenues.

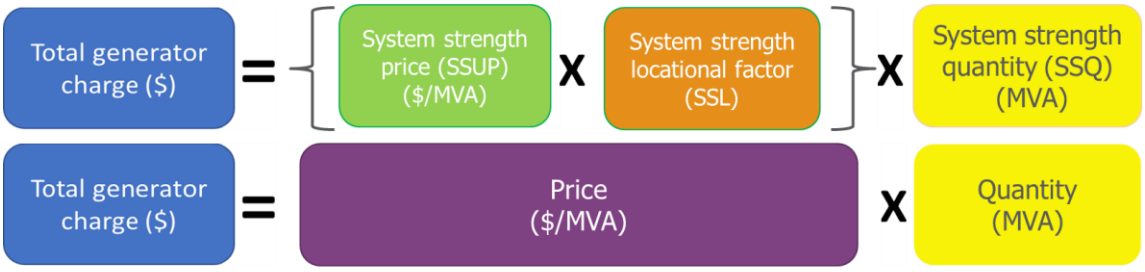
There are also several other issues that the final rule allows us to address in our pricing methodology guidelines, including the method for indexation of the unit price.

B.1.4 Prescribed structure of the system strength charge

The final rule prescribed both the structure of the new system strength charge and who would be responsible for determining the guidance, calculations and key input forecasts required to administer it.

Figure B.7.1 shows the system strength charge structure prescribed in the rules.

Figure B.7.1 Prescribed components of the system strength charge



Source: AEMC, *Rule determination: Efficient management of system strength*, 21 October 2021, p.25.

The prescribed component parts of the system strength charge are:

System strength unit price (SSUP; unit price) in $/MVA for the relevant system strength node is the unit price for system strength procured from a given system strength provider.

The AER's pricing methodology guidelines will specify permitted methodologies for determining the unit price component of the charge following the principles set out in Rules clause 6A.25.2(h).

The unit price must be included in a system strength provider's transmission pricing methodology and must be shown to comply with the permitted pricing methodologies and any information requirements set out in the AER's pricing methodology guidelines.

The unit price is fixed for the duration of each system strength charging period, which is usually five years, subject to annual indexation (see section 4).[67] Although the unit price is fixed, the total generator charge is variable as it is impacted by the relative system strength quantities (MVA).

System strength locational factor (SSL; locational factor) is the relative electrical distance from the closest system strength node for a newly connecting generator or load, calculated as the ratio of the:

- additional fault level needed at the nearest system strength node to restore the available fault level at the connection point to the pre-connection level, and
- system strength quantity requirement of the connecting party plant.

The relevant network service provider will calculate the locational factor for each connection, drawing on AEMO guidance in its impact assessment guidelines. The relevant network service provider will update the locational factor at the start of each system strength charging period to account for any changes to the network.

System strength quantity (SSQ) is the expected consumption of the service (calculated as MVA/MW x MW) by the party connecting to the grid, which will be estimated from:

- the size of the connecting plant in MW, and
- its short circuit ratio (SCR) as determined by the relevant SCR access standard.

AEMO will provide guidance through its impact assessment guidelines, and the relevant network service provider would use this guidance to calculate this component for each connection. The system strength quantity is fixed at the time of connection unless alterations to the connected plant require an update to the agreed performance standards.

B.1.5 Interaction with existing transmission network pricing methodologies

The AEMC's final rule also set out arrangements for how the costs of system strength service provision would be recovered from both system strength charges and existing prescribed transmission services.

At a high level, these arrangements specified that:

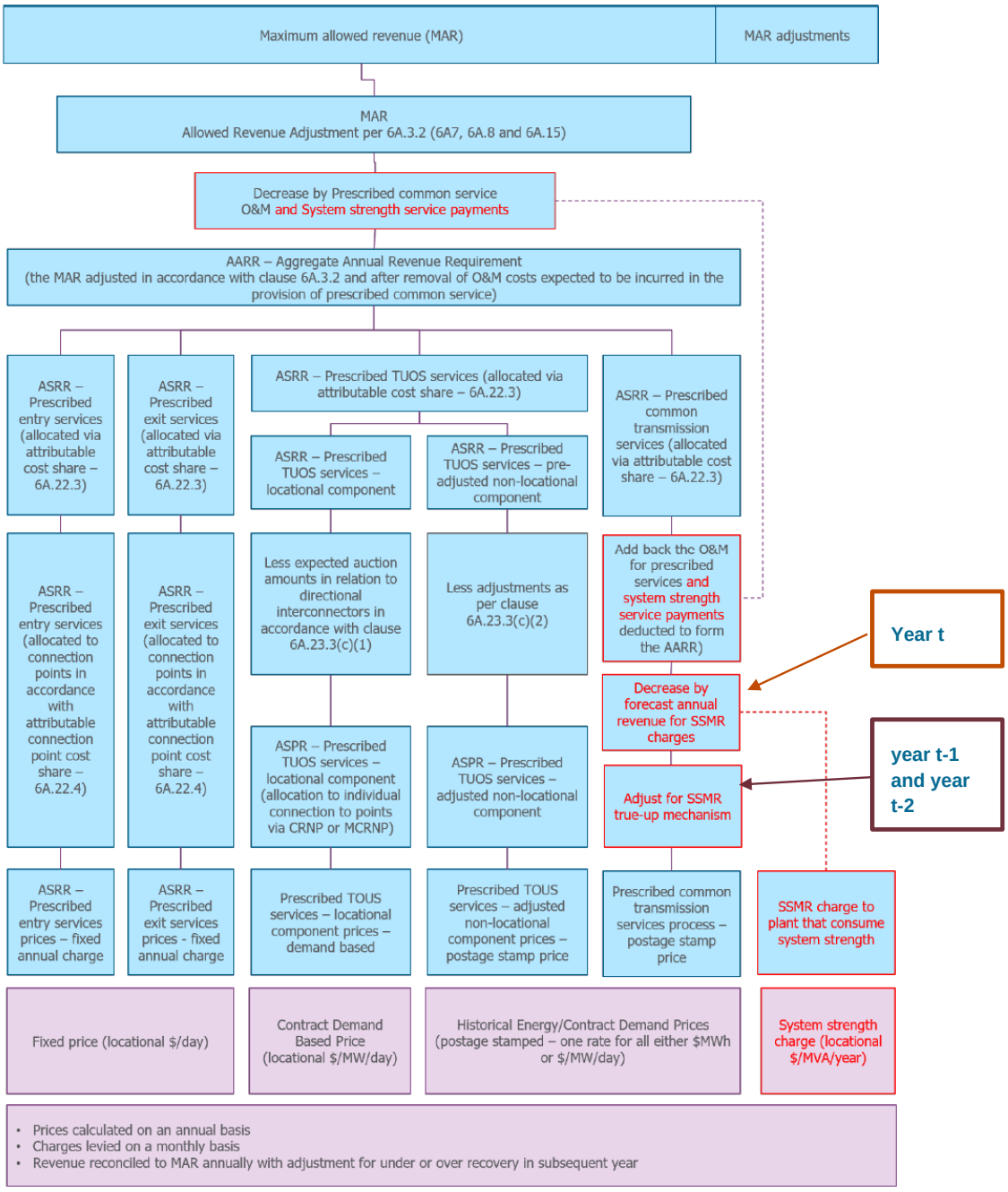
- system strength charges would reflect the system strength provider's estimated long run costs of service provision

[67] Each system strength charging period runs from the start of the second regulatory year in a regulatory control period of the system strength provider to the end of the first regulatory year in its next regulatory control period – see clause 6A.23.5(b).

- the costs of providing system strength, after deducting forecast revenues earned from system strength services and any true-up thereof, will be allocated to prescribed common transmission services and recovered from transmission customers on a postage stamp basis.

The AEMC illustrated this via the following figure.

Figure B.7.2 How system strength pricing interacts with existing transmission pricing



Source: AEMC, *Rule determination: Efficient management of system strength*, 21 October 2021, p. 181.

Note: Figure B.7.2 shows that system strength providers must forecast system strength revenues for year t, and true-up estimated and actual revenues from years t–1 and t–2, respectively. We discuss these issues in section 5.

B.2 Scope of the AER's guidance task

The AEMC's final rule requires the AER to modify the transmission pricing methodology guidelines for two new requirements:[68]

> The *pricing methodology guidelines* must specify or clarify:
>
> (h) permitted methodologies for determining the *system strength unit price* component of the *system strength charge*, having regard to the following:
>
> (1) the *system strength charge* structure in clause 6A.23.5;
>
> (2) the desirability of providing efficient investment and *system strength transmission service* utilisation signals to actual and potential *System Strength Transmission Service Users* based on the long run cost of providing *system strength transmission services* at the relevant location;
>
> (3) the desirability of consistent pricing structures across the NEM; and
>
> (4) the costs and benefits associated with calculating, implementing and applying the methodology; and
>
> (i) principles for determining forecast *annual system strength revenue* and estimated actual *annual system strength revenue*.

B.2.1 What the pricing guidance must cover

B.2.1.1 Permitted pricing methodologies for system strength

The pricing methodology guidelines must specify or clarify the permitted methodologies for determining the unit price component of the system strength charge.

These methodologies may differ from transmission networks' existing methodologies because those methodologies are required to allocate the maximum allowed revenue based on full cost recovery to the various types of prescribed transmission services.

[68] NER clauses 6A.25.2(h) and 6A.25.2(i). Note, clause 6A.25.2 sets out the required contents of the pricing methodology guidelines.

In contrast, the final rule provides for the permitted pricing methodologies for system strength to be based on the long run cost of providing system strength transmission services at the relevant location. They are not based on transmission networks' regulated maximum allowed revenues and, as such, will not be based on the same fully allocated cost approach currently used for other services.

We discussed this issue further in section 3.

B.2.1.2 Forecasting system strength revenue

The pricing methodology guidelines must specify or clarify principles for determining forecast annual system strength revenue for the relevant pricing year (year t) and estimated and actual annual system strength revenue for prior years for the purpose of administering the annual true-up mechanism.

These are forecasts of the revenues earned from the system strength charge. They are used to administer the system strength providers' annual tariff setting and maximum allowed revenue compliance. We discussed this issue in section 5.