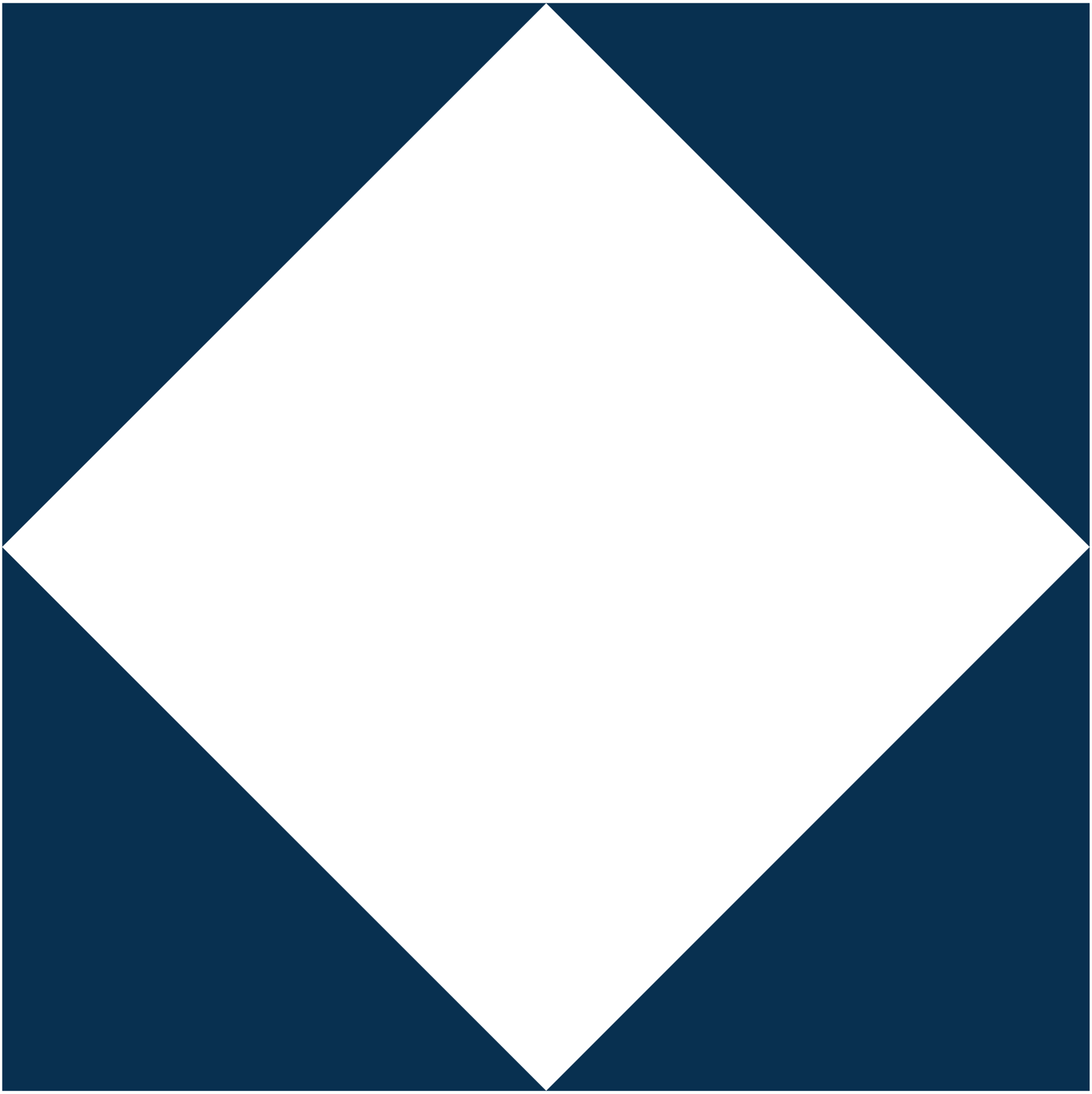

Insights report

Effectiveness of the TSS process and options for implementing export charges

11 March 2021

farrierswier

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Glossary

Term	Definition
2014 network pricing rule change	AEMC, *Distribution Network Pricing Arrangements, Final Determination*, 27 November 2014.
Charging parameter	This is defined in the rules as: 'The constituent elements of a tariff.'
Customer impact principles	Clause 6.18.5(h)
Economic cost concepts	Cost concepts referred to in the pricing rules, including long run marginal cost, total efficient cost, standalone cost and avoidable cost. Other than total efficient cost, these concepts are not required to align to the building block revenues determined by the AER under a distribution determination.
Pricing principles	Clause 6.18.5
Tariff classes	This is defined in the rules as: '*A class of retail customers for one or more direct control services who are subject to a particular tariff or particular tariffs*'. It refers to the grouping of customers by their usage and connection characteristics, and form of metering.
Tariff structures	This refers to the combination of charging parameters and charging windows that together create the tariff a customer is assigned to.
Tariff levels	This refers to the price set for each charging parameter.
Tariff	Tariffs are the group of charging parameters that together form the set of prices a given retail customer's retailer will be charged by the DNSP. This grouping of charging parameters involves specific prices set for 2 or more of the charging parameters.
TSS process	In this report, when we refer to the 'TSS process' we are referring to all three parts of this process for setting network prices, namely the tariff structure statement, annual pricing proposals and pricing principles. Our main focus is on how the 5 yearly TSS is developed, consulted on and approved to set tariff structures that comply with the pricing principles, as those are the most relevant issues for export pricing.

Abbreviations

Term	Definition
ACCC	Australian Competition and Consumer Commission
AEMC	Australian Energy Markets Commission
AER	Australian Energy Regulator
DMO	Default Market Offer
DNSP	Distribution network service provider
DUoS	Distribution use of system
LRMC	Long-run marginal cost
NEM	National Electricity Market
NER or the rules	National Electricity Rules
SCS	Standard control services
ToU	Time of use
TSS	Tariff structure statement
VDO	Victorian Default Offer

Executive summary

SCOPE AND APPROACH

Our scope | The Australian Energy Market Commission (AEMC) engaged farrierswier to prepare a TSS insights report to help it to understand, if it makes a rule to remove the prohibition on export charging:

- how distribution network service providers (DNSPs) and the Australian Energy Regulator (AER) would be likely to implement export pricing under the existing tariff structure statement (TSS) process or a potentially modified TSS process, and
- how the preferences and potential concerns of jurisdictional governments, customers and other stakeholders would be considered and addressed as part of the TSS process.

Our approach | We developed this insights report by drawing on four key elements:

1. *Stakeholder input* | We reviewed relevant parts of stakeholder submissions to the AEMC's issues paper, presented to and surveyed members of the AEMC's technical working group, and surveyed DNSPs about the first 2 rounds of TSS processes to date (for most DNSPs).

2. *Issue and lesson identification* | We distilled the experience to date, stakeholder input and our own experience of the pricing rules and distributed energy integration to identify TSS lessons and threshold rule considerations arising from the various options for introducing export pricing.

3. *Scenario testing* | We developed potential scenarios that capture threshold options relevant to testing identified potential issues. We then agreed with the AEMC a set of scenarios for tariff structures and approaches to transition that illustrate the variety of potential ways an export pricing rule change could be implemented and discussed these scenario scopes with AER staff.

4. *Rule review* | We have reviewed the current pricing rules and experience of their application to identify any challenges these may present for export pricing, and how the rules could address issues identified for export pricing.

FINDINGS

Conclusions | Insights from our TSS lessons and scenario analysis (both discussed below) support the conclusion that, subject to some consequential rule changes that preserve the functioning of certain rules as intended, the TSS process and pricing principles are robust for introduction of export pricing. We found no reason to expect that material consumer harms would remain after the application of the existing pricing safeguards. In particular:

- **The existing TSS process is sufficiently flexible |** The existing TSS process and pricing principles provide for a range of different transitional tools and other mechanisms that DNSPs and the AER can use (in consultation with customers) to mitigate the impact of introducing export pricing on customers.
- **Scenarios that include measures to mitigate consumer impacts are more likely to be adopted by DNSPs and approved by the AER |** The existing TSS process and pricing principles are likely to steer DNSPs towards scenarios that include measures to mitigate potential harm for exporting consumers during transition, e.g. through some combination of how residual costs are allocated, providing a choice of network export tariffs and/or including export rewards as in scenarios 4 to 6, as those scenarios are more likely to comply with the current rules and be approved by the AER.

- **Scenarios with high potential for negative customer impacts are not explicitly prohibited but are unlikely in practice |** While scenarios that have higher potential for customer harm, most notably scenarios 2 and 3, are not explicitly prohibited by the rules, the current TSS requirements mean there is a high likelihood that these scenarios would not be proposed by DNSPs or approved by the AER. This is especially so if some consumers raise significant concerns with them during the consultation that is required by both DNSPs and the AER as part of the TSS process.
- **There is a trade-off between potential impacts on exporting customers and potential benefits for non-exporting customers |** All of the scenarios involve a trade-off between the size of potential increases in network charges for exporting customers and the size of potential reductions in network charges for non-exporting customers. It is likely to be preferable to use the existing TSS process to balance these considerations and determine the most appropriate scenario following consultation by DNSPs and the AER with customers for each DNSP. Where the balance between these considerations lies may vary between different networks depending on local conditions such as the extent of DER uptake and the level of export constraints.
- **Additional transitional rules to mitigate customer impacts are not likely to be needed or desirable |** If the AEMC considered the potential for customer impacts was too high under some scenarios, it could amend the rules to prohibit those scenarios. For example, there may be less transitional impacts and less compliance burden if the rules require incremental pricing of export services with no reallocation of residual costs. Such a requirement may seem desirable during initial reform implementation as an aid to less disruptive transition, but could create a rule impediment to desirable and efficient network tariff designs when export pricing becomes a larger share of DNSP revenues or for the design of network tariffs for large users. We consider that the same outcome could be achieved through the testing of customer preferences through engagement in the existing TSS process.

If the AEMC considers that it is necessary to include additional transitional arrangements to mitigate the potential for customer impacts, then our report sets out several options for potential transitional requirements and the advantages and disadvantages of each option.

In addition, there may be value in the AER developing a pricing guideline. This guideline could either be developed by the AER of its own accord or the rules could require the AER to develop and consult on such a guideline.

Potential rule amendments | Notwithstanding our overall conclusions above, there are however some additional measures we have identified that could aid functioning of the rules, reduce regulatory burden or allow the AEMC to act to rule out or require certain options for how export pricing is implemented. These include:

- *Consequential rule changes* | Some rules that require modification to explicitly reference exports in order to continue to apply as intended—e.g. augmenting tariff assignment rules to include export characteristics, and considering permitting tariff design to send signals to retailers and energy intermediaries
- *Potential rule clarifications* | Some rule clarifications that the AEMC could consider to remove doubt about the function of some rules and thereby lessen regulatory burden in complying with and administering those rules for DNSPS and the AER respectively—e.g. defining 'tariff' and confirming if 'usage' is consumption or use of distribution services or use of the network
- *Potential rule mandates* | Some rule changes the AEMC could consider if it wanted to mandate certain approaches to the introduction of export pricing—e.g. what sort of transition should be applied.

INSIGHTS FROM TSS LESSONS

TSS lessons | The key outcomes of the first 2 rounds of TSS processes in terms of achieving the intentions of the AEMC's 2014 network tariff reform rule changes are shown in Table ES.1. This table also shows key implications for applying the TSS process to export pricing.

Table ES.1: TSS lessons and export pricing implications

Intent	Outcome so far	Implications for export pricing
Improved cost reflectivity, which should enable consumers to make more informed and efficient usage and investment decisions	Limited progress for small customers Primarily caused by: • Opt in cost reflective network tariffs in TSS round 1 • Retailers offering cost reflective network tariff signals to <4% of small customers (based on AER SA and QLD analysis in 2020)	Decisions by retailers and their customers will determine customer impacts and the extent of benefits realisation from the reform. Experience suggests that mandatory assignment to network tariffs will best support benefits realisation without impacting customers, whose impacts are determined by retail tariffs. The pricing rules may not adequately permit DNSPs to design network tariffs for retailers and intermediaries, not just end customers.
Lower average prices for consumers in the medium to long term as some consumers respond to the price signals	Too early to assess, given most small customers do not face price signals yet and there are many other factors that affect average prices that may make it hard to identify any impact from tariff reform	The preconditions for this do not yet exist at scale. A significant share of customers would need to be both assigned to cost reflective network tariffs and their retail tariff or new technology or services would need to enable them to respond to the price signals.
Improved consultation in the development of network tariffs. That the consultation requirements and customer impact principles address the potential for some customers to be negatively impacted	Recognised success	Engagement is: • starting on average 3 years before the new TSS periods • involving a broad range of customers and stakeholders • influencing tariff structures and arrangements for tariff transition • driving customer and consumer representative support which the AEMC technical working group rated as the factor most assisting the pace of reform and benefits realisation. The goodwill created from past TSS consultation and the processes established to realise it should help future consultation on export tariff reform.

INSIGHTS FROM CONSIDERING SCENARIOS

Benefits available from this reform | The AEMC has identified three limbs to the proposed export pricing rule changes:

1. *Updating the framework* | Updating DNSPs' service definitions, obligations and planning requirements
2. *Aligning incentives* | Including export services in service performance incentive schemes
3. *Allowing price signals* | Enabling pricing tools for export services.

These reforms can potentially advance the National Electricity Objective by enhancing productive, allocative and dynamic efficiency in electricity supply and use. If implemented, these limbs can be expected to support the efficiency benefit realisation in different ways. In the case of pricing, how it is implemented will affect the extent and breadth of efficiency benefits that can be achieved.

At a high level, updating the framework and aligning incentives will support *productive efficiency* in the provision of distribution network services. In theory, sending export pricing signals should support *allocative efficiency*. Our scenarios show that pricing signals can also enhance *productive* and *dynamic efficiency* by improving how DNSPs use DER exports and how exporters integrate their behaviour with the energy system and markets.

Scenarios we assessed | The scenarios have been designed to test threshold export pricing design and application variables that can affect the potential for negative impacts on customers, benefits realisation, the application of particular pricing rules and customer protections, and variations in the nature of the export service being provided and the benefits being realised from the reform.

We have structured our scenarios in order from the highest potential for negative customer impacts through to the lowest, and sought to recognise the path dependency of the need for transitional measures. We have assessed customer impacts for both export customers and non-export customers.

The focus areas of the scenarios are summarised in the table below. The six scenarios we have used are described below the table.

Table ES.2: TSS tools, pricing principles and other considerations tested in each scenario

Key ⊘ relevant to this scenario ● particularly important for this scenario ⊗ not relevant to this scenario

Scenarios 1: jurisdictional prohibition; 2: highest impact; 3: retailer choice; 4: transition from export entitlement; 5: incremental pricing; 6: cost and reward

	Tool/principle/ consideration	Scenarios that will test the tool/principle/consideration						Reasons for not testing it further in any of the scenarios
		1	2	3	4	5	6	
TSS process	DNSPs must consult consumers and retailers when developing TSS	⊘	⊘	⊘	⊘	⊘	⊘	
	AER must consult on proposed TSS	⊘	⊘	⊘	⊘	⊘	⊘	
Network pricing principles	Network pricing objective, efficient pricing bounds, LRMC, considering fully allocated costs, and staying within total allowed revenues	⊘	⊘	⊘	⊘	⊘	⊘	
	Recovery of residual costs	⊗	●	⊘	⊘	●	⊘	
	Customer understanding principle	⊗	⊘	⊘	●	⊘	●	
	Customer impact principles - impact of price changes	⊗	●	⊘	⊘	⊘	⊘	
	Customer impact principles - choice of network tariff	⊗	⊘	⊘	●	⊘	⊘	
	Customer impact principles - ability to mitigate impacts through usage decisions	⊗	⊘	⊘	●	⊘	●	
	Compliance with jurisdictional obligations	●	⊘	⊘	⊘	⊘	⊘	
Other network pricing considerations	Classification of export service as a new SCS, ACS or unregulated service	⊗	⊗	⊗	⊗	⊗	⊗	Unlikely to be adopted. Costs likely to exceed benefits
	Classification of exports as a new tariff class	⊗	⊗	⊗	⊗	⊗	⊗	As above
	Negotiated service for large users or separate tariff / tariff class for large users	⊗	⊗	⊘	⊘	⊘	⊘	Possible under scenarios 3-6 but not examined in detail as focus is on small users
	Impact on consumers will depend on extent of pass-through by retailers	⊗	●	●	●	⊘	●	
	Dynamic forms of pricing	⊗	⊗	⊗	●	⊗	●	
	Locational pricing	⊗	⊗	⊗	⊗	⊗	⊗	Unlikely to be adopted for small users

Scenario insights | The scenarios (as scoped in section 4.3 of the report) enabled us to 'stress test' how the rules would perform in each scenario, assess the extent to which identified issues would be addressed and reform benefits realised, and identify any potential rule amendments that may further support implementation of export pricing. The key insights from each scenario are set out below.

1. Jurisdictional prohibition scenario

Description | In this scenario DNSPs are prohibited by jurisdictional governments from establishing tariffs based on exported energy, but are still required to provide export services and permitted to recover the costs of providing and using export services through existing network access and consumption tariffs.

Insights | This scenario can be accommodated within the current rules, but only the supply-side benefits of DER export integration could be achieved, and all customers would continue to pay for export services irrespective of their ability and willingness to export.

2. *Highest impact scenario*

Description | In this scenario each DNSP introduces one mandatory export tariff with no optionality for customers in network tariffs and immediate reassignment of existing exporters to this tariff. Tariff levels reflect both incremental export costs and a reallocation of residual costs. Tariffs involve export charges but not payments (i.e. no rebates for export at beneficial times or locations) and are set full tariff levels on day 1 without a pricing transition. All retailers pass on the network export tariffs in full in their retail offers. This scenario may benefit some customers (primarily customers without generation, who will receive a reduction in their network charges), but is intentionally designed to have the highest risk of negative impacts for some customers with generation.

Insights | This scenario has the greatest potential bill impact on export customers with the greatest savings for non-export customers. All reform benefits are largely achieved, through there is scope for further enhancement. This scenario may be possible within the current rules, but there is a high risk that it would infringe the current pricing principles and would not be approved by the AER. Significant additional consumer engagement, compliance demonstration and assessment would be required by DNSPs and the AER respectively. As a result, we expect that this scenario is unlikely to be proposed by DNSPs without some form of transitional arrangements to make it more likely to satisfy the customer impact principles.

3. *Retailer choice scenario*

Description | In this scenario the same network tariff specification as scenario 2 applies however some retailers either do not pass on the network tariffs or do not do so to the full extent. This allows customers to opt out of network export charges through their choice of competitive retail offer.**Insights** | In the sequence we have assessed it, this scenario is capable of the same benefits realisation and customer impacts as scenario 2, however the extent of these will be determined by the decisions of retailers and their customers. The rule compliance issues are the same as under scenario 2, with a high risk that the proposed tariffs will not comply with the current rules and will not be approved by the AER (noting that the AER is unlikely to know for certain at the time of approval of the first TSS containing export prices whether those prices will be passed on by retailers).

We note that in practice this scenario is effectively an overlay to all DNSP export pricing scenarios (i.e. scenarios 2 to 6). The consequences are that price impacts for exporting energy will be based on customers' choices of retail offers, which may include no impact, and that the extent of benefits realisation from the export pricing reform will be determined by that choice.

4. *Incremental pricing scenario*

Description | This scenario builds upon scenario 3 by only attributing incremental costs to export charging parameters. This avoids reallocating currently shared costs to export prices. It supports lower export prices and means that exporting customers only pay export charges that reflect the expected future costs of providing export capacity to serve them. This approach also reduces implementation costs by overcoming the need for DNSPs to revise their existing access and consumption-based tariffs and compliance models.

Insights | This scenario is possible under the current rules (particularly if supported in customer engagement) and could enhance allocative efficiency relative to scenarios 2 and 3. It could be an effective way of managing potential consumer harm and complying with the consumer impact principles. It could have much less compliance burden (compared to scenarios 2 and 3) because it could avoid needing to rebalancing existing consumption-based tariffs.

A potential downside of this approach is that it could impede DNSPs' ability to efficiently recover their residual costs from export tariffs where doing so would best comply with the current pricing principle requirement (clause6.18.5(g)(3)) to minimise distortions to the price signals for efficient usage. For example, if export services are seen as a less essential service than electricity consumption services and exporters can still make a net profit from exports after accounting for retail feed in tariffs, then they may have a less price responsive demand for network use than some electricity consumers (e.g. lower income or vulnerable customers). In these circumstances it may be efficient and consistent with the NEO to allocate residual costs to export services.

5. *Transition from export entitlement scenario*

Description | This scenario introduces optionality for customers regarding the type of export service they want and how much they are willing to pay for different levels of service. It captures how the nature of the export service could be implemented in the bidirectional tariff structure by having differential prices for charging parameters that link to different forms and scales of export.

For this scenario we assume the tariff structure has existing access and consumption-based charging parameters and three new export charging parameters are added:

- *Static limit exports block 1* | Low or no charge for exports up to a specified amount that is based on either the average existing static limit applied by that DNSP for customers of that type or the existing intrinsic capacity currently provided to customers of that type or location
- *Static limit exports block 2* | A (higher) charge for permitted exports purchased between block 1 and a specified export cap
- *Dynamic control customer initiated exports* | An incentive-based charge for exports above block 1 set at a price lower than block 2 for variable export capacity provided through a dynamic operating envelope.

Insights | This scenario is possible within the current rules. It introduces export service choice in a manner that can minimise customer impacts of immediate export pricing implementation. It further enhances allocative and dynamic efficiency relative to prior scenarios. It likely requires more consultation to explain a greater range of export service options and corresponding tariffs. It also introduces questions about how the level of export service capacity provision and performance is monitored, and the need for customers to understand that any optional services will not confer a 'firm' or 'guaranteed' right to always export that amount of energy.

6. *Cost and reward scenario*

Description | This scenario builds upon scenario 5 by adding an export charging parameter that rewards exports that are likely to reduce network costs. [1] An *export rewards* charging parameter would be set to provide an incentive rebate (negative tariff) paid to customers in certain circumstances.

This could apply to exports that occur when called upon by the DNSP, eg through notification of an upcoming rebate period (like a critical peak rebate tariff) or some form of dynamic control (like some existing demand response services). Alternatively, it could be a simpler structure where exports in a predefined time window are rewarded on the basis that exports during that period are likely to alleviate network congestion (like many existing demand charges).

Insights | This scenario is possible under the current rules, maximises the extent of benefits realisation for all forms of efficiency (relative to the other scenarios) and has the most favourable customer impacts for exporters[2] and non-exporters of any of the export pricing scenarios.

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1 We note that while we have made this scenario incremental to scenario 5, it could also be applied as a variant to scenarios 2, 3 and 4.

2 We note that whether this scenario is favourable for exporters over scenario 1 (jurisdictional prohibition), will depend on whether smearing incremental export costs across all customers and not having the network savings of DNSPs using export services to lower their costs, has a lower price impact for exporters than paying incremental export costs for their choice of export service, being able to be rewarded for those exports that help DNSPs lower their costs and benefiting from lower network costs overall.

1. Introduction

1.1 PURPOSE OF THIS INSIGHTS REPORT

In looking at the pricing rules for distributed electricity exports into distribution networks, the Australian Energy Market Commission (AEMC) is:

- considering enabling pricing tools for *potential* use, and therefore
- reviewing the *process for the use of those tools* to ensure it would remain fit for an augmented distribution service scope that more clearly includes provision of distributed electricity export services.

The implications of establishing the pricing tools and tariff structure statement (TSS) process are that, like with consumption-based tariff reforms, the range of possible outcomes is very broad. It needs to be given the breadth of customer types and connection and network characteristics that those rules will apply to across the shared distribution networks. Notwithstanding this potential breadth, the AEMC is interested in the foreseeable outcomes for smaller customers through application of the TSS process.

The pricing-related benefits to be realised through improved allocative efficiency will be affected by how, when and at what cost the export pricing reforms are implemented. These too will be determined through application of the TSS process.

The AEMC has engaged farrierswier to understand if it makes a rule to remove the prohibition on export charging:

1. how distribution network service providers (DNSPs) and the Australian Energy Regulator (AER) would implement export pricing through the TSS process, and
2. how the preferences and concerns of jurisdictional governments, customers and stakeholders would be considered and addressed in the TSS process.

Questions facing the AEMC include:

- Are there any potential outcomes it should act now to avoid upfront, versus let the TSS process do what it is designed to do? That is, the TSS process is designed to avoid negative potential outcomes on a case-by-case basis following customer and stakeholder engagement and after accounting for any jurisdictional government requirements
- Are there any modifications to the pricing rules or TSS process that would better ensure success of the reform? For example, by:
    a. clarifying the application of the rules to export charges
    b. lowering the cost to administer the TSS process and regulation, or
    c. improving the pace and effect of reform.

1.2 OUR APPROACH

Our approach to developing this insights report has involved four key elements:

1. *Stakeholder input* | We have reviewed relevant parts of stakeholder submissions to the AEMC's issues paper, presented to and surveyed members of the AEMC's technical working group, and surveyed DNSPs about the first two rounds of TSS processes that have been completed to date.

2. *Issue and lesson identification* | We have distilled the experience to date, stakeholder input and our own experience of the pricing rules and distributed energy integration to identify lessons from experience and threshold rule considerations arising from the various options for introducing export pricing.

3. *Scenario testing* | We have developed potential scenarios that capture threshold options relevant to testing identified potential issues. We then agreed with the AEMC a set of scenarios for tariff structures and approaches to transition that illustrate the variety of potential ways an export pricing rule change could be implemented. These scenarios enabled us to 'stress test' how the rules would perform in each scenario, assess the extent to which identified issues would be addressed, and identify any potential rule amendments that may further support implementation of the export pricing reforms.

4. *Rule review* | We have reviewed the current pricing rules and experience of their application to identify any challenges these may present for export pricing, and how these rules could address issues identified for export pricing.

1.3 STRUCTURE OF THIS REPORT

Pricing rule context

The distribution network pricing rules need to provide for efficient pricing in the many different circumstances that exist across a DNSP's network and customer base. For example, the rules must allow for efficient pricing to heavy industry connected to the high voltage power system as well as for small households connected to the low voltage power system. This diversity requires a broad set of rule permissions for different pricing tools and the TSS process needs to provide fit for purpose use of these tools and (where relevant) protections for different customer types.

The TSS process and any rule protections must also recognise that the National Electricity Rules (NER or the rules) establish prices charged to retailers, not prices that are directly charged by DNSPs to retail customers.

The TSS process is currently designed to deal with a mass of complex situational detail and variance for each DNSP. This includes consideration of economic principles for efficient pricing, customer impacts, legacy pricing arrangements, legacy metering capabilities, pace of transition, jurisdictional requirements, customer and stakeholder engagement, and the desire for pricing predictability.

Report structure to recognise pricing rule context

We have structured this insights report to explain the TSS process and stress test it for export pricing.

- In section 2 we outline the existing pricing rules and TSS process, the intent of these, and key pricing concepts relevant to the pricing rules and their application.
- In section 0 we ask: *How has the TSS process operated to date, and what are the relevant lessons for export pricing?*
- In section 0 we explain key service and pricing considerations for export pricing and then identify the various ways that export pricing could be established under the NER. We also develop a set of threshold scenarios based on the potential outcomes for benefits realisation and customer impact and consider how the rules would apply differently to export pricing compared with consumption pricing.
- In section 5 we assess the outcomes of our scenarios.
- In section 6 we finally consider: *Are there any additional challenges for export pricing and how could they be addressed in the TSS processes or pricing rules, and are there complementary non-pricing rule measures that warrant consideration?*

2. Overview of the existing pricing rules and TSS process

This section explains the existing pricing rules and TSS process, the intent of these rules, and key pricing concepts relevant to those rules and their application.

2.1 WHAT IS THE TSS PROCESS?

The rules currently require DNSPs to set their network tariffs through a process involving three key requirements that are explained in more detail in sections 2.2 and 2.3 below:

- **Tariff Structure Statement (TSS)** | DNSPs develop their tariff structures for their upcoming regulatory periods (usually a 5 year period) in a document referred to as a TSS. DNSPs consult on proposed tariff structures and policies and procedures for assigning customers to tariffs. Once approved by the AER, these are locked-in for the regulatory period, except in limited circumstances where amendments are allowed. This process only sets tariff *structures* not tariff *levels*,[3] although the TSS does set out how tariff levels will be calculated and indicative tariff levels for the regulatory period are included in an attachment to the TSS.
- **Annual pricing proposals** | Tariffs for each year of the regulatory period are proposed by DNSPs and approved by the AER as part of the annual pricing proposal process. The focus of this process is on whether the *levels* of tariffs comply with the requirements of the approved TSS, the NER, and the AER's distribution determination.
- **Pricing principles** | DNSPs' tariffs for direct control services must comply with a series of pricing principles set out in the rules. These principles aim to make network tariffs reflect each DNSP's efficient costs of providing services to its retail customers, subject to consumer impact principles and any jurisdictional obligations.

In this report, when we refer to the '*TSS process*' we are referring to all three of these parts of this process for setting network prices. However, our main focus is on how the 5 yearly TSS is developed, consulted on and approved to set tariff structures that comply with the pricing principles, as those are the most relevant issues for export pricing tariff reform. The annual pricing proposal process is explained briefly below but is not a focus of this report and is unlikely to need to change materially to accommodate export pricing.

2.2 WHEN AND WHY WAS THE TSS PROCESS INTRODUCED?

The current rules were made in November 2014 as part of the AEMC's Distribution Network Pricing Arrangements rule change ('2014 network pricing rule change').[4] These changes were made in response to two rule change requests – one from Energy Ministers in relation to the network pricing process and pricing principles and one from IPART in relation to the network pricing process and timeframes.

[3] Section 2.4.1 explains the distinction between these and other relevant pricing concepts used in the pricing rules.

[4] AEMC, *Distribution Network Pricing Arrangements, Final Determination*, 27 November 2014.

2.2.1 Key changes to the pricing rules in 2014

The 2014 network pricing rule change made major changes to the rules for how DNSPs develop their network tariffs. The key changes are summarised below and are set out in more detail in the table in Appendix B from the 2014 network pricing rule change final determination:

- **The TSS process was introduced** | Prior to the 2014 network pricing rule change, network tariffs were entirely set as part of the annual pricing proposal process. The new rules introduced a new two-stage process for setting network tariffs where tariff *structures* are set for the regulatory period as part of the TSS process and tariff *levels* are set as part of the annual pricing proposal process.
- **The TSS process was integrated with the revenue determination process** | Prior to the new rules, network revenues were set as part of the 5 yearly distribution determination process, but network tariffs were not considered as part of that process and were set under the separate annual pricing proposal process. The new rules integrated the process for setting revenues and tariff structures.[5]
- **DNSPs were required to consult with customers and retailers when developing the TSS** | As part of its major changes to the revenue determination rules in 2012, the AEMC required DNSPs to describe how they have engaged with consumers in developing their regulatory proposals and sought to address any concerns. The 2014 network pricing rule change extended that requirement to TSSs, requiring DNSPs to describe how they have engaged with retail customers and retailers in developing their proposed TSSs and how they have sought to address concerns.
- **New pricing principles were implemented requiring more cost reflective network tariffs** | The rules have always contained network pricing principles, but prior to 2014 they were high-level and largely non-binding. The new rules amended the pricing principles to make them more detailed and binding with a stronger focus on developing tariffs that reflected DNSPs' efficient costs of providing services to customers.
- **Customer impacts were recognised in the pricing principles** | The new rules expressly recognised the tension between the efficiency benefits of more cost reflective tariffs and the potential negative customer impacts from this change. The new pricing principles therefore expressly required DNSPs to apply certain customer impact principles when developing tariffs.
- **Timeframes for the annual pricing proposal process were amended to give earlier notice of price changes** | Before 2014, the timeframes for the annual pricing proposal process meant retailers and customers were given very little notice of network tariffs changes. Under the new rules, annual network tariffs are finalised at least six weeks before they commence and must align with the tariff structures approved for the five year period in the TSS.

The new rules were phased in to align with the timeframes for different DNSPs' regulatory proposals and annual pricing proposal processes, with all DNSPs operating under the new rules by 1 July 2017. Transitional rules were included for the first TSS period to reflect that some DNSPs had already submitted their regulatory proposals or were already part-way through a regulatory period. This meant that most DNSPs' first TSS only covered 3 or 4 years rather than the usual 5 years.

2.2.2 2014 pricing rule change objectives

The key objectives of these changes to the rules are summarised by the following quotes from the executive summary to the AEMC's final determination:

- **Improved cost reflectivity, which should enable consumers to make more informed and efficient usage and investment decisions**

[5] We note that for some DNSPs, transitional requirements meant that TSS round 1 was not aligned and had a shorter TSS pricing period than the corresponding 5 year regulatory period. For TSS round 2, these periods are now aligned.

Because each consumer's network prices currently do not reflect the costs of supplying network services to that consumer, some consumers currently pay more than the costs caused by their usage. Other consumers, in particular those that use a greater proportion of their energy at peak times, pay less than the costs caused by their usage. This is because existing network prices over-recover for off-peak use of the network and under-recover for peak use...

Under the final rule, distribution businesses will be required to develop network prices that are cost reflective and send efficient pricing signals to consumers. This will allow consumers to make more informed decisions about their energy use as new technologies emerge and result in better outcomes for both individual consumers and the overall electricity system.

- **Lower average prices for consumers in the medium to long term as some consumers respond to the price signals**

  In the medium term, average network charges across all consumers are expected to be lower under cost reflective network prices than they otherwise would have been under current price structures. This is due to some consumers deciding to make small changes to how they use energy, which not only saves them money but also reduces overall network peak demand and overall network costs, which flows through to all consumers through lower average network charges over time. NERA's case studies show that the majority of consumers are expected to pay lower network charges under cost reflective prices compared with current price structures.

- **Improved consultation in the development of network tariffs**

  There will also be more consultation with consumers and retailers in the development of network prices, and the process for setting prices will be more transparent. Network prices will be finalised earlier, allowing consumers and retailers more time to prepare for price changes.

- **The consultation requirements and customer impact principles will address the potential for some customers to be negatively impacted**

  Moving to network prices that better reflect the way that individual consumers use network services will result in some consumers facing lower network prices and some consumers facing higher network prices than under current price structures. As illustrated by the research above, the majority of consumers are expected to benefit from these changes though lower network prices in the medium to longer term.

  Concerns about the potential impacts on those consumers that will face higher prices will be partly addressed by the new requirements to consult with consumers when developing prices. If network price changes are likely to be significant for some consumers, the consumer impact principle expressly allows distribution businesses to phase-in the new prices over five years or more.

The AEMC recognised that the practical impact of the new rules will depend on how they are applied by DNSPs and the AER, and the extent to which retailers structure their retail prices to consumers in a way that matches the structure of network prices. The AEMC stated:[6]

The rules do not determine a single price structure that all networks must adopt. It is important that distribution businesses develop prices that best suit the particular circumstances of their network and their customers, after consultation with consumers and retailers, and subject to oversight by the AER.

It is also important to note that consumers do not pay network businesses directly for network services. Instead, retailers pay network charges to distribution businesses and charge consumers a bundled retail price. This retail price includes a component that recovers the network charges paid by the retailer to the distribution business in

6 AEMC, *Distribution Network Pricing Arrangements, Final Determination*, p viii.

relation to the consumer's use of the network. Network prices are separately itemised on large commercial and industrial consumers' bills, but residential and small business consumers only see the retail price.

The final rule does not require retailers to structure their retail prices in a way that matches the structure of network prices. The Commission does not consider that such a requirement on retailers would benefit consumers. Retailers operate in a competitive market and outcomes for consumers will be improved if retailers are free to design their prices as they see fit in response to consumer preferences and the other costs retailers face. However, because network charges are retailers' largest cost, they will have a significant incentive to pass on network price signals to consumers in some form when deciding how to structure their retail prices.

2.3 WHAT DOES THE TSS PROCESS REQUIRE?

2.3.1 The TSS process

The TSS process is integrated into the AER's 5 yearly determination of each DNSP's regulated revenue requirements. The rules require that:

- each DNSP develops a proposed TSS and submits it to the AER with its regulatory proposal, and
- the AER make draft and final decisions on the TSS as part of its determination for the DNSP.

As noted above, DNSPs must consult with customers and retailers when developing the proposed TSS. The DNSP's regulatory proposal and proposed TSS must be accompanied by an overview paper which, among other things, must describe how the DNSP engaged with retail customers and retailers in developing the proposed TSS and sought to address relevant concerns identified through engagement.

The AER is also required to consult on its assessment and approval of the TSS, including publishing the proposed TSS, inviting submissions, publishing an issues paper, holding a public forum on the issues paper, publishing a draft determination, inviting submissions on the draft determination and holding a predetermination conference.

The TSS must set out:

- the tariff classes into which retail customers for direct control services will be divided
- the policies and procedures the DNSP will apply for assigning retail customers to tariffs or reassigning retail customers from one tariff to another
- the structures for each proposed tariff
- the charging parameters for each proposed tariff
- a description of the approach the DNSP will take in setting each tariff as part of the annual pricing proposal process for each year of the regulatory period.

A TSS must also be accompanied by an indicative pricing schedule which sets out the indicative price levels for each tariff for each year of the regulatory period. The prices in this pricing schedule are not binding, but the DNSP's annual pricing proposal must demonstrate how each proposed tariff is consistent with the indicative pricing levels set out in the TSS or explain any material differences.

A DNSP must comply with the TSS approved by the AER and any other applicable requirements in the rules when setting its tariffs. A TSS may only be amended during a regulatory period with the AER's approval if an event has occurred that was beyond the reasonable control of the DNSP and could not reasonably have been foreseen by the DNSP at the time its current TSS was approved by the AER.

2.3.2 The pricing principles

The rules set out a 'pricing objective', which is that:

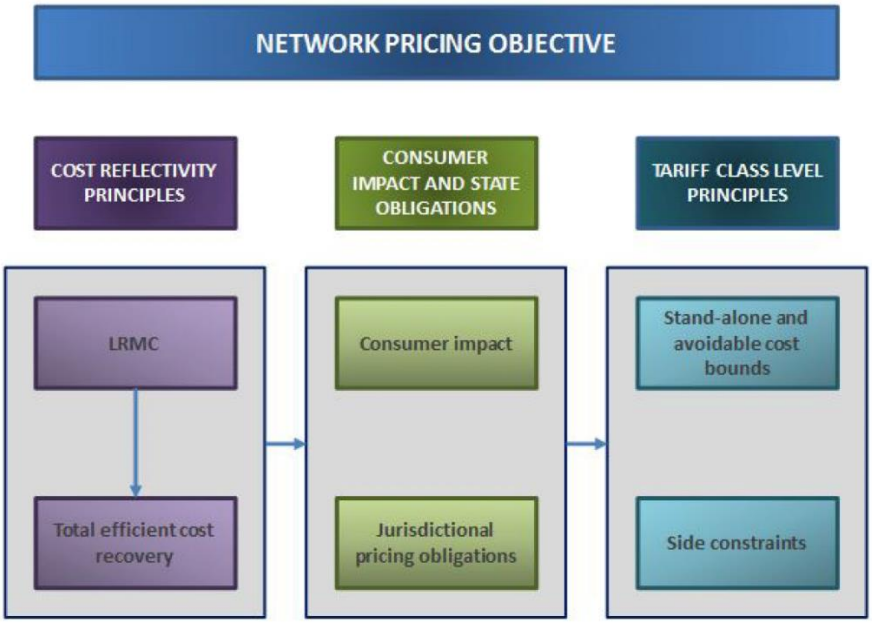
> *tariffs that a Distribution Network Service Provider charges in respect of its provision of direct control services to a retail customer should reflect the Distribution Network Service Provider's efficient costs of providing those services to the retail customer.*[7]

This high-level objective was intended to inform the application of the more specific pricing principles by DNSPs and the AER.

The rules also set out a series of pricing principles, which are summarised in Table 2.1 below.

The rules provide for a hierarchy between the pricing objective and each of the pricing principles. This is summarised in the following figure and quote from the AEMC's final determination for the 2014 network pricing rule change.[8]

Figure 2.1: Intended operation of the pricing objective and pricing principles



> *The network pricing objective should guide how DNSPs apply each of the pricing principles and exercise the flexibility and discretion that they have under each principle. The final rule requires that a DNSP must comply with the pricing principles in a manner that will contribute to the achievement of the network pricing objective.*
>
> *The first step for DNSPs in developing their network prices will be to calculate cost reflective prices.*
>
> *To calculate cost reflective prices, each tariff must first be based on LRMC, as required in order to send efficient future network cost signals. The difference between LRMC based prices and the DNSP's expected revenue as determined under its distribution determination must then be recovered in accordance with the principle on recovery of total efficient costs. There is no conflict between these pricing principles because LRMC*

7 Clause 6.18.5(a) of the NER.

8 AEMC, *Distribution Network Pricing Arrangements, Final Determination*, p25.

is used as a starting point and DNSPs are allowed to adjust LRMC based prices to recover total efficient costs.

The final rule then allows DNSPs to vary from prices which comply with the cost reflectivity principles to the extent necessary to give effect to the consumer impact and jurisdictional pricing obligation principles. There is no conflict within these principles because DNSPs are expressly allowed to adjust prices that meet the cost reflectivity principles to meet the jurisdictional pricing obligation and consumer impact principles.

This hierarchy reflects the AEMC's intention in that rule change that network tariffs should be as cost-reflective as possible, but that the extent of cost-reflectivity may be limited by:

- requirements under jurisdictional instruments, such as state-based uniform tariff requirements
- the impacts on customers of transitioning to cost-reflective tariffs
- the side constraints.

Importantly, the customer impact principles in clause 6.18.5(h) only relates to impact of year-to-year price changes and therefore the speed of the transition. It does not allow DNSPs and the AER to decide to *never* move to cost-reflective tariffs that comply with the other principles. It allows for the *pace* of that transition to be adjusted to account for customer impacts. The following AEMC quotes illustrate the intent of this principle and how the TSS process would address customer impacts:[9]

The requirement to consider the impact of network price changes on consumers when determining how to transition consumers to cost reflective prices will assist DNSPs to manage price shocks by allowing them to transition consumers to cost reflective network prices over time. The final rule expressly allows this transition to take place over more than one regulatory control period. Regulatory control periods are usually five years long...

In demonstrating compliance with the pricing principles in the TSS under the proposed new pricing framework, DNSPs will be required to set out the network tariffs that would best meet the cost reflectivity principles and the adjustments they have made from these tariffs to meet the consumer impact principle. This will provide a clear and transparent tariff setting process. Notably, many DNSPs submitted that they currently make trade-offs between efficient pricing and consumer impacts. The key difference under the new pricing principles will be that these trade-offs will be transparent and assessed against the cost reflectivity and consumer impact principles by the AER.

2.4 WHAT PRICING CONCEPTS DO THE RULES AFFECT?

2.4.1 What are the pricing concepts?

The rules include certain network pricing language and defined network pricing terms that are relevant to different rules and to the TSS process. These terms and their rule definitions (where defined) are:

- **Tariff classes** | This is defined in the rules as: '*A class of retail customers for one or more direct control services who are subject to a particular tariff or particular tariffs*'. It refers to the grouping of customers by their usage and connection characteristics, and form of metering. In practice, tariff classes are usually very broad. For example, Ausgrid's current tariff classes are low voltage, high voltage, sub-transmission, transmission and unmetered.
- **Tariffs** | Tariffs are the group of charging parameters that together form the set of prices a given retail customer's retailer will be charged by the DNSP. This grouping of charging parameters involves

9 AEMC, *Distribution Network Pricing Arrangements, Final Determination*, pp 23 and 169.

specific prices set for 2 or more of the charging parameters shown in Figure 2.2. Tariffs is not a defined term in the rules.

- **Charging parameters** | This is defined in the rules as: '*The constituent elements of a tariff.*' Charging parameters commonly used in existing network tariffs are shown in Figure 2.2.

Figure 2.2: Common electricity charging parameters

	Access	Energy	Demand	Capacity
				
What is it?	Ability to receive energy Cost per day for being connected to the grid	Amount of energy used Cost per unit of energy consumed, which may be over a defined time period	Rate energy is used Maximum demand at a point in time, which may be over a defined time period	Maximum rate energy is to be used at the connection point Maximum demand at a point in time (KVA)
Billing units	NMI, meter, customer	kWh	KVA, kW	KVA
Common labels	Supply charge, fixed charge, standing charge, access charge	Consumption charge, usage charge, energy charge	Demand charge, rolling demand, ratcheting demand	Booked capacity, capacity reservation charge, contracted demand, ratcheting demand
Common variants	Generally a flat daily rate	Can be: time of use, seasonal, in consumption blocks, involve a feed in tariff	Can be: time of use, seasonal, in demand blocks	Can have minimum chargeable capacity

Two further pricing concepts that the rules affect are:

- **Tariff structures** | This refers to the combination of charging parameters and charging windows that together create the tariff a customer is assigned to
- **Tariff levels** | This refers to the price set for each charging parameter.

A DNSP's AER-approved TSS will determine the tariff structures that must apply for the whole regulatory period. The TSS only includes indicative tariff levels, which will vary during the regulatory period and are set through the annual pricing process.

2.4.2 Which rules apply to which pricing concepts?

The current network pricing rules include a suite of requirements for efficient cost reflective network pricing and customer safeguards on how such pricing is transitioned to and applied. The practical impact of these rules depends in part on whether they apply at the tariff class, tariff or charging parameter level.

These differences in how the rules apply mean some rules may have limited impact in practice for export pricing depending on how it is introduced. The export pricing scenarios in section 0 show the potential consequences of different approaches and which pricing rules would be binding under each scenario.

Table 2.1: Mapping rules to the pricing concepts they apply to

Rule requirement	Tariff class	Tariff	Charging parameter
Retail customers with a similar connection and usage profile should be treated on an equal basis	Clause 6.18.4 Assignment to tariff classes		
Retail customers with micro-generation facilities should be treated no less favourably than retail customers without such facilities but with a similar load profile	Clause 6.18.4 Assignment to tariff classes		
Retail customers in a tariff class should not collectively be charged more than the standalone cost of supplying that group of customers or less than the avoidable cost of supplying that group of customers	Clause 6.18.5(e) Efficient pricing bounds prohibit uneconomic levels of cross-subsidy between tariff classes		
Regulated network tariff for providing regulated distribution network services to a retail customer should reflect the distribution network service provider's efficient costs of providing those services to the retail customer		Clause 6.18.5(a) Network pricing objective	
Each tariff must be based on the long run marginal cost (LRMC) of providing the service to which it relates to the retail customers assigned to that tariff		Clause 6.18.5(f) basing tariffs on LRMC	
Expected revenue from each tariff must reflect the DNSP's total efficient costs of serving the retail customers that are assigned to that tariff		Clause 6.18.5(g)(1) consideration of fully allocated costs	
Expected revenue from all tariffs collectively must not exceed the revenues determined by the AER for that DNSP for the relevant service		Clause 6.18.5(g)(2) staying within total allowed revenues	
Recover allowed revenues across tariff and charging parameters in a way that least distorts the price signals for efficient usage of the DNSP's services	Clause 6.18.5(g)(3) recovering residual costs from those customers and charging parameters least likely to distort efficient use of the network services		

Rule requirement	Tariff class	Tariff	Charging parameter
Networks can transition to compliant cost-reflective tariffs by managing the annual change in network tariffs to account for: a. a reasonable period of transition, which may extend over more than one regulatory period b. whether retail customers have a choice of network tariff c. the extent to which retail customers can mitigate the impact of any changes in tariffs through their usage decisions		Clause 6.18.5(h) customer impact principles	
Annual change in revenues cannot exceed 2% above inflation and the allowed annual total revenue growth determined by the AER for the DNSP's standard control service	Clause 6.18.6 side constraint		
The structure of each network tariff must be reasonably capable of being understood by retail customers that are assigned to that tariff given the nature of those customers and the information provided to them and consultation undertaken by the DNSP		Clause 6.18.5(i) customer understanding principle	
Tariffs must comply with the rules and all applicable regulatory instruments	Clause 6.18.5(j) compliance with all rules and regulatory instruments including those set by states and territories		
Networks are required to consult when developing their tariff structure statements	Clause 6.8.2(c1a) requirements for overview paper to accompany the proposed TSS which must include a description of how the DNSP engaged with retail customers and retailers in developing the proposed TSS and sought to address any relevant concerns identified as a result of that engagement		
The AER is required to consult when reviewing and approving or rejecting tariff structure statements	Clause 6.9.3 requirements for AER consultation on the proposed TSS		

3. Lessons learned

This section shares insights on how the current TSS process has been applied for consumption-based pricing reform, including how it has evolved over time. It is structured in three parts, covering the process in section 3.1, the outcomes in section 0 and lessons learned from these in section 3.3. For each lesson we flag its potential relevance for considering export pricing scenarios, and in section 3.3.3 we note distinguishing features about export services that should be considered when relying on lessons gained through consumption-based tariff reforms.

These lessons draw from:

- desktop research of past TSS processes and outcomes, and commentary thereon from market bodies
- stakeholder engagement with the AEMC's technical working group, and AER and AEMC staff
- surveys of technical working group members and of DNSPs about the first two rounds of TSS processes to date.

The technical working group survey respondents included government departments, consumer representatives, retailers, DNSPs, other energy service providers, consultants who support market participants, the Clean Energy Council and the Australian Renewable Energy Agency.

3.1 WHAT HAVE THE TSS PROCESSES INVOLVED?

3.1.1 Summary of TSS processes so far

We have nearly completed two rounds of TSS processes for most DNSPs

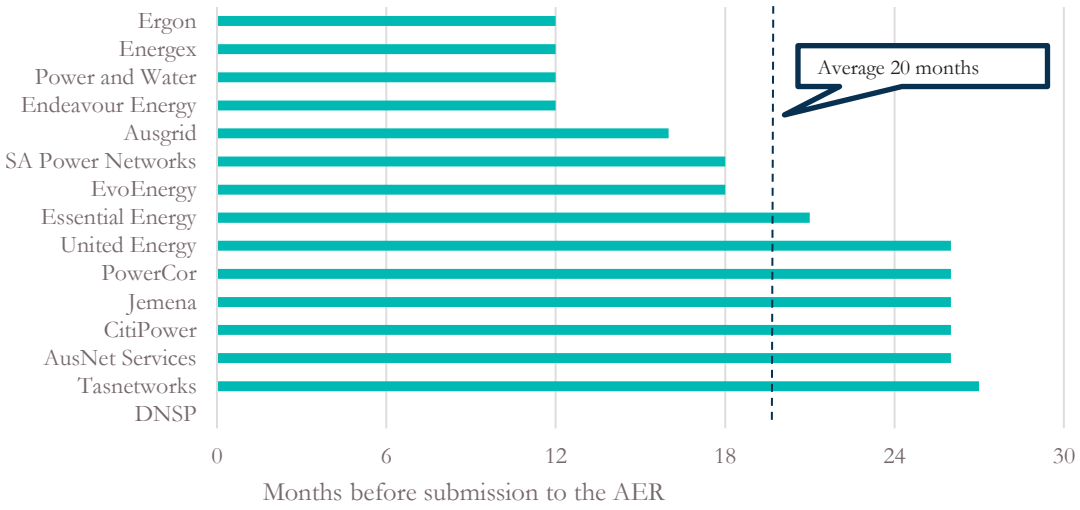
Following the AEMC's 2014 network pricing rule change, the AER has been assessing TSS proposals since late 2015. The first round of approved TSSs took effect for all DNSPs in 2017. Most DNSPs[10] are into their second TSS period, and the AER is currently reviewing the second round of Victorian TSSs for determination by April 2021 which will apply from 1 July 2021.

Customer engagement generally starts 3 years prior to a TSS period

Our survey of DNSPs showed that the lead time to initiate their TSS engagement and development processes has generally increased from TSS round 1 to TSS round 2. Figure 3.1 illustrates the lead times for customer engagement in TSS round 2 relative to the AER submission date. These lead times range between 12 and 27 months before lodging the initial proposal, with an average of 20 months. When you add the 17 month window for AER review, consultation and determination prior to when the TSS periods commence, this means engagement is starting on average 3 years before the commencement date of the new TSSs and associated tariffs.

[10] The NSW, SA, Qld, Tas and ACT DNSPs are currently in their second TSS period. The NT DNSP only transitioned to AER determinations from its 2019-24 determination, and so is in its first TSS period.

Figure 3.1: Lead time for DNSP customer engagement prior to AER submission of TSS round 2



Source: DNSP TSS survey Dec 2020-Jan 2021.[11]

Engagement often started by co-designing pricing objectives with customers

Many networks use their early engagement forums in each TSS process to work with their customers and stakeholders to agree tariff objectives or design principles that would inform the TSS development process. Table 3.1 provides examples of these from both TSS rounds.

An insight these objectives show is that most of them have a direct line of sight to pricing principles in the rules. We note that equity is commonly mentioned in the co-designed objectives and does not get explicitly mentioned in the pricing rules beyond:

1. the implied equity outcomes of causer pays principles of cost reflective pricing in the network pricing objective and related cost-based pricing principles, and
2. the tariff assignment rule 6.18.4(a)(2) which requires that 'retail customers with a similar connection and usage profile should be treated on an equal basis'.

Table 3.1: Co-designed tariff objectives arising from TSS engagement processes

TSS process	Agreed objectives
TSS round 2	
Victoria | AusNet Services, CitiPower, Jemena, Powercor, United Energy	simplicity, economic efficiency, adaptability, affordability and equity[12]

[11] Note that Power and Water Corporation has only had one round of TSS approvals since joining the national regime, and this occurred concurrent with other DNSPs round 2 TSSs, so we have included it in that round.

[12] AusNet Services, Tariff Structure Statement 2022-26 - explanatory paper, January 2020, p.22.

TSS process	Agreed objectives
TSS round 1	
SA | SA Power Networks	simplicity, empower the customer, fairness and equity, and rules compliance[13]
Victoria | Jemena	Recover efficient costs of operation—that we have sufficient funding to provide a safe and reliable electricity network service now and into the future Drive economic efficiency—set prices that are cost reflective and empower customers to make efficient electricity consumption decisions Treat customers equitably—our tariff classes and tariffs ensure similar customers pay similar prices Facilitate simplicity and transparency—our customers can understand our tariffs and respond to price signals Provide predictability—our prices remain relatively stable over time to support customers' ability to make long-term decisions.[14]

A breadth of customers and stakeholders have been engaged with

The common parties that all DNSPs reported engaging with were:

- end-use residential customers
- end-use business customers
- jurisdictional governments
- AER staff
- AER consumer challenge panel
- retailers
- customer advocates
- emerging technology providers and energy intermediaries
- renewable energy advocates
- business and industry groups.

Several DNSPs also consulted their customer consultative committees, formed dedicated pricing working groups, or even consulted their people's panel. Other groups that some DNSPs engaged with included: AEMC staff, academics, local and federal government, Members of Parliament, and ombudsmen.

Many DNSPs also commissioned independent research to inform TSS development

Research topics in the most recent TSS round included:

- customer preference surveys
- price elasticity of demand
- vulnerable customer impact analysis
- community perceptions of preparing for EVs
- tariff structuring
- behavioural economic research
- long-run marginal cost modelling
- demand forecasting
- load profiles and charging windows.

All DNSPs have identified that engagement has shaped their TSS proposals

All DNSPs reported examples of pricing outcomes that would not have been proposed in their TSSs if not for their customer engagement and research. Some examples (focusing on smaller customers)

[13] SA Power Networks, DNSP survey response, January 2021.

[14] Jemena, Draft Tariff Structures Statement 2016-20, 30 April 2015, p.12.

identified from TSS round 2 are provided in Table 3.2 below. A full list of DNSPs' reported examples is provided in Appendix A in Table A.1.

Table 3.2: TSS round 2 examples of customer engagement influences

DNSP(s)	Reported customer impact
AusNet Services	For households and small businesses we targeted a co-designed tariff structure and transition that would be acceptable to all – the result was incorporated in our proposal and accepted by the AER. The pace of transition as well as the merits of different cost reflective structures were discussed.
CitiPower, Powercor, United Energy	The simple two-part residential and small business time of use (ToU) tariffs were a compromise between the 5 key pricing objectives identified by stakeholders. Our residential and small business tariff assignment criteria we designed to minimise bill impacts and minimise the risk of vulnerable customer bill increases.
SA Power Networks	Customers and retailers told SAPN that its tariffs were too complex. In response, among other examples, SAPN: • departed from its long-favoured demand tariffs and designed a ToU tariff for residential customers • ceased proposing a critical peak price • has over time streamlined the numbers of tariffs and components within tariffs. Customers and stakeholders have raised jurisdiction specific priorities for tariff design and had these addressed. For example, SA customers told SAPN that managing the solar trough to mitigate the need for additional network spend (which would be recovered from all including non-solar customers), was a key concern of theirs. In response, SAPN designed a solar sponge tariff to motivate customers to shift their consumption demand to periods of peak solar export.
Evoenergy	A key theme identified from consumer engagement for the development of Evoenergy's proposed TSS is that accessible information and education is critical to help consumers understand cost reflective tariffs and their benefits. In particular, Evoenergy has: • developed a suite of communication materials to support residential and LV commercial customers during the implementation of demand tariffs, and • hosted an 'Energy Matters' workshop in September 2018 to explain proposed changes to the tariff structure and build relationships with large customers.
Endeavour Energy	Stakeholder engagement directly impacted tariff design, peak charging windows, transition period and assignment policy.

DNSP(s)	Reported customer impact
Ausgrid	Customer research influenced the initial TSS proposal in two main ways: • including seasonal time of use as the main default cost reflective network pricing structure due to the general negative customer reactions to capacity pricing and it being the least acceptable to customers • a higher fixed charge was acceptable to customers provided change was gradual. The initial TSS proposal therefore included a slight rebalancing of cost recovery towards the fixed cost charges gradually over the 5 years. Some customer advocates and stakeholders did not agree with the above approach and favoured a maximum demand tariff for residential customers and to keep the fixed charge to variable charge ratio the same. Our engagement with the Pricing Working Group for the revised proposal resulted in co-designing the suite of residential and small business demand tariffs (3+3), that accommodated customer preferences for fixed vs TOU energy charge, and also allowed for an introductory tariff for customers assigned to a demand tariffs from flat tariff due to the accumulation meter failure. This tariff would allow 12 months of learning of consumption patterns before automatic reassignment to a demand tariff. Customer impact analysis informed the calibration of the new demand tariffs.

Source: DNSP TSS survey Dec 2020-Jan 2021, and TWG survey Dec 2020-Jan 2021

Most DNSPs had TSS changes requested by the AER during its review process

In TSS round 2, other than SA Power Networks whose initial TSS proposal was approved[15] in the draft decision, all DNSPs had changes requested by the AER as a result of its rule compliance review and customer consultation process. These changes related to:

- tariff structures (i.e. the charging parameters approved compared to those proposed)
- form of transition (i.e. arrangements for mandatory assignment, opt out, opt in)
- pace of transition.

DNSPs reported that the changes did not relate to tariff levels due to compliance with the pricing principles (other than those changes arising from movement in the allowed building block revenues).

A full list of DNSPs' reported examples is provided in Appendix A in Table A.2.

AER staff have identified to us that at times the AER has intervened to either progress tariff reform or to give greater weight to the customer impact principles. Examples cited were:

- moving some networks from opt-in to opt-out assignment to cost reflective tariffs (e.g. TasNetworks)
- requiring cost reflective tariffs to be discounted relative to flat rate tariffs to incentivise their uptake in a number of jurisdictions (e.g. Endeavour Energy)
- not allowing Ausgrid's proposal to mandatorily reassign large numbers of customers given stakeholder concern over their ability to understand and engage with the new tariffs
- engaging in Ergon Energy and Energex's TSS processes including efforts to support residential, small business and large users and their representatives through numerous 'teach ins' on the regulatory process.

15 While the AER decided to approve SAPN's TSS without amendment, the AER subsequently required that the year 1 implementation of mandatory assignment to cost reflective tariffs be deferred by 1 year due to COVID-19 concerns. Small customers on interval meters have generally remained on legacy tariffs for 2020/21.

Jurisdictional government involvement was common but not always timely

Most DNSPs reported that representatives of the applicable state or territory government either participated directly in or were periodically briefed on their TSS development processes.[16]

In our survey of the technical working group members, a consumer representative observed that postage stamp pricing obligations – which governments apply to some jurisdictions – 'trump other price signals'.

In TSS round 1 in Victoria, the state government acted after lodgement of the TSS proposals in September 2015 to establish a moratorium on mandatory tariff assignment to cost reflective network tariffs. This ultimately led to a process of re-work for the DNSPs and the customers and consumer representatives they engaged with to establish new proposed TSSs that complied with these arrangements. Box 1 captures the sequence of events.

TSS round 1 | Victorian intervention after TSS engagement and submission process

In September 2015, Victorian DNSPs submitted their TSS proposals for the 2017-2020 period, following their customer and stakeholder engagement programs for developing those TSS proposals.

In February 2016, the AER released its draft decision on the 2017-20 TSS proposals. This decision was in response to the announcement on 21 December 2015 by the Minister for Energy and Resources of her intention to require Victorian distributors to implement changes to distribution network pricing arrangements. This had the effect of requiring that cost reflective tariffs be introduced in Victoria on an opt-in basis only.

In April 2016, DNSPs submitted revised TSS proposals.

In September 2017, the Victorian AMI Amending (AMI Tariffs) Order was gazetted. Distributors' tariff structure statements were required to comply with that Order. This had the effect of allowing medium-sized customers to opt-out of a cost reflective tariff from 1 January 2018. DNSPs then submitted a revised tariff structure statement to reflect this change, which the AER approved.

Round 2 benefited from process refinements

As DNSPs, the AER and the stakeholders that DNSPs engage with gained familiarity with the new TSS process, several initiatives occurred that enhanced the functioning of the TSS process:

AER-initiated Network Tariff Reform Roundtables | The AER has convened a series of 3 Network Tariff Reform Roundtables attended by participants across the supply chain, consumer groups, and market bodies. These followed the round 1 TSS processes and ran alongside the round 2 TSS processes. AER staff report that they aimed to support a consistent, systematic approach to network tariff reform and facilitate broader conversations about the goals and mechanisms of tariff reform. The AER also convened some dedicated retailer engagement sessions during the SA and Queensland round 2 TSS processes to discuss how new network tariff structures would be reflected in retail tariffs for consumers. We discuss the AER's reported findings from these in section 3.2.1.

AER explanatory guidance | Over time, appendices to AER TSS determinations increasingly published analysis and statements of AER policy preference about key aspects of tariff reform. This also included explicitly stating things that the AER expected to see change in the second round of TSS processes. The

16 This included TSS development in Tasmania, Victoria, NSW, and SA.

AER now maintains a network tariff reform website[17] that points to its most current thinking from TSS determinations, publishes thought pieces on emerging issues (e.g. EVs tariff trials and DER integration), and tracks projected progress in the share of customers whose retailers will receive a cost reflective network tariff signal from their DNSP.

Joint DNSP engagement | Over two years the Victorian distributors delivered a multifaceted engagement approach to jointly develop their tariff structure and assignment policy for small customers (both households and small businesses consuming under 40MWh per annum). This learned from the experiences of the first Victorian TSS round where after the TSSs had been submitted to the AER the Victorian government required the DNSPs to change their proposals to ensure alignment across DNSPs on certain tariff structure and assignment elements (e.g. peak charging windows and opt in assignment to cost reflective tariffs).

Round 2 benefited from retail safeguards

In its technical working group survey response, the Victorian Department of Environment, Land, Water and Planning representative observed that the Victorian Default Offer (VDO) now provides an additional customer safeguard at the retail tariff level in Victoria.

In contrast a retailer also stated that:

> *The DMO [default market offer] was designed to be a retailer level customer safeguard. However, the efficacy of this safeguard has yet to be determined particularly in light of cost reflective network tariffs.*

In that same survey a different retailer replied that:

> *The risks tend to also be managed through retail product design. The retail market is subject to a range of competition, market monitoring and consumer protection regulations that could inform intervention if need be.*

3.2 WHAT HAVE THE TSS PROCESSES ACHIEVED?

In this section, we explore what have been the tariff reform outcomes so far. We do so by reference to TSS outcomes relative to the AEMC's intent in the 2014 reforms. As noted earlier, the AEMC's stated objectives of the 2014 network pricing rule change that established the TSS process were:

1. improved cost reflectivity, which should enable consumers to make more informed and efficient usage and investment decisions
2. lower average prices for consumers in the medium to long term as some consumers respond to the price signals
3. improved consultation in the development of network tariffs
4. that the consultation requirements and customer impact principles address the potential for some customers to be negatively impacted.

We consider the outcomes and efficacy of the TSS process for each of these objectives based on surveys of DNSPs and the AEMC's technical working group, materials published by the AER, and our own analysis of TSSs approved to date.

[17] See: https://www.aer.gov.au/networks-pipelines/network-tariff-reform.

3.2.1 Improved cost reflectivity

AEMC intent | *Improved cost reflectivity, which should enable consumers to make more informed and efficient usage and investment decisions*

Outcome so far | *Limited progress for small customers*

Enabling customers to make more informed and efficient usage and investment decisions requires that they are not only assigned to cost reflective network tariffs, but that their retail tariff or other services provided by their retailer or a third party enables them to respond to the network price signals. As at December 2020, there has been limited progress.

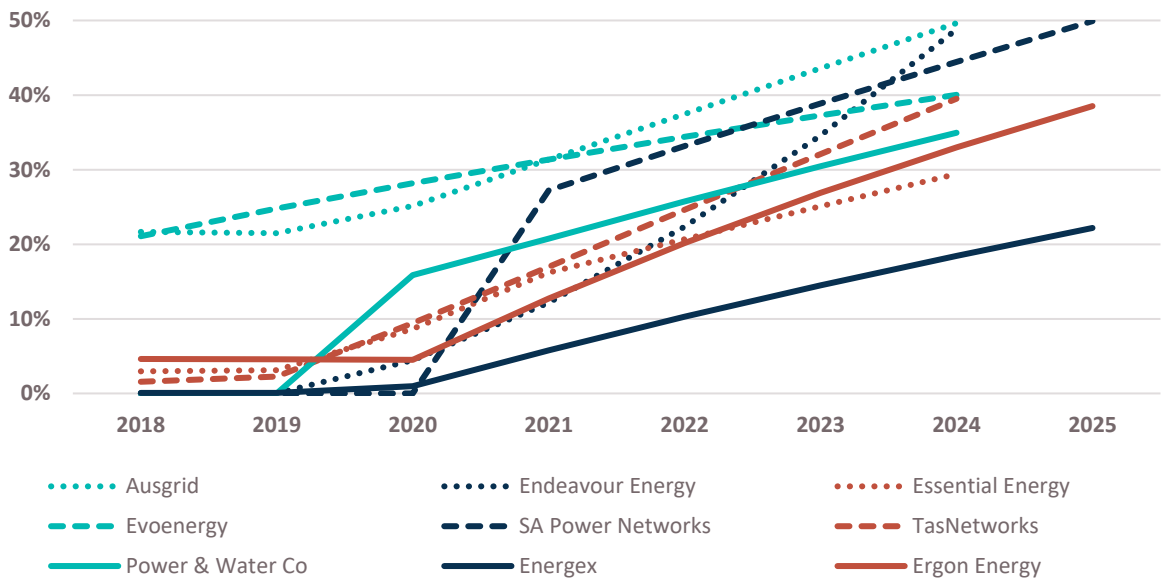
The AEMC acknowledged this in its 2020 ENEFR which cited the Distributed Energy Integration Program's Outcome Report, stating:

> *Despite progress at the network level, full cost reflective and socially accepted tariff reform at the consumer level has proven to be difficult to implement effectively. Lack of analysis of the impact on various consumer groups, lack of clarity as to how network tariffs could play out through retailers, how retailers will translate tariffs to customers and what protections and supports will be put in place for vulnerable consumers, are all contributing to delays and concerns.*[18]

Efficiency of network prices

Figure 3.2 shows that up to the commencement of the second round of TSS periods, there has been negligible levels of residential customers whose retailers face cost reflective network tariffs for most DNSPs.[19] The marked change in the pace of cost reflective assignment illustrated below is attributed on the AER's tariff reform website to the change from opt-in to opt-out assignment policies between the first and second round of TSSs.

Figure 3.2: Percentage of residential customers whose retailers face cost reflective network tariffs



18 AEMC, Final report - Electricity network economic regulatory framework 2020 review, October 2020, p.45.

19 This chart only includes DNSPs for whom the AER can made its round 2 TSS determination.

Source: AER

The common forms of residential network pricing changes that we have seen since the 2014 network pricing rule change include networks now having:

- time of use demand charges for all tariff classes not just large user tariff classes
- time of use charging windows that better align with system load profiles and with understandable periods that could better support behavioural change (e.g. longer off-peak periods, removal of shoulder periods, some use of seasonal tariffs)
- a simplified and reduce number of tariffs, through having slowly unwound legacy tariffs.

Tariff reform has also benefited from a greater share of customers now having smart meters capable of supporting cost reflective network tariffs. However, this remains at lower penetration rates than contemplated in the Power of Choice reforms that had introduced contestable provision of smart meters.

Extent of network signals in retail prices

It is widely recognised that retailer pass through of network signals for residential and small business customers has been negligible to date. Around 90% of our technical working group survey respondents reported that the extent to which cost reflective distribution tariffs are currently reflected in retail tariffs has been insufficient to achieve the benefits expected in the AEMC's 2014 network pricing reforms. Respondents also rated '*Retailer support and the extent of pass through into retail tariffs*' as the largest cause of delay to the pace of tariff reform.

Retailer feedback to the AER suggests retailers are still working on developing more innovative offers. In 2020, the AER published a research paper titled '*Understanding the impact of network tariff reform on retail offers*'. This followed AER engagement with retailers and energy service providers of various sizes, and examined data for SA and Queensland (its most recent TSS decisions at the time). It identified that:

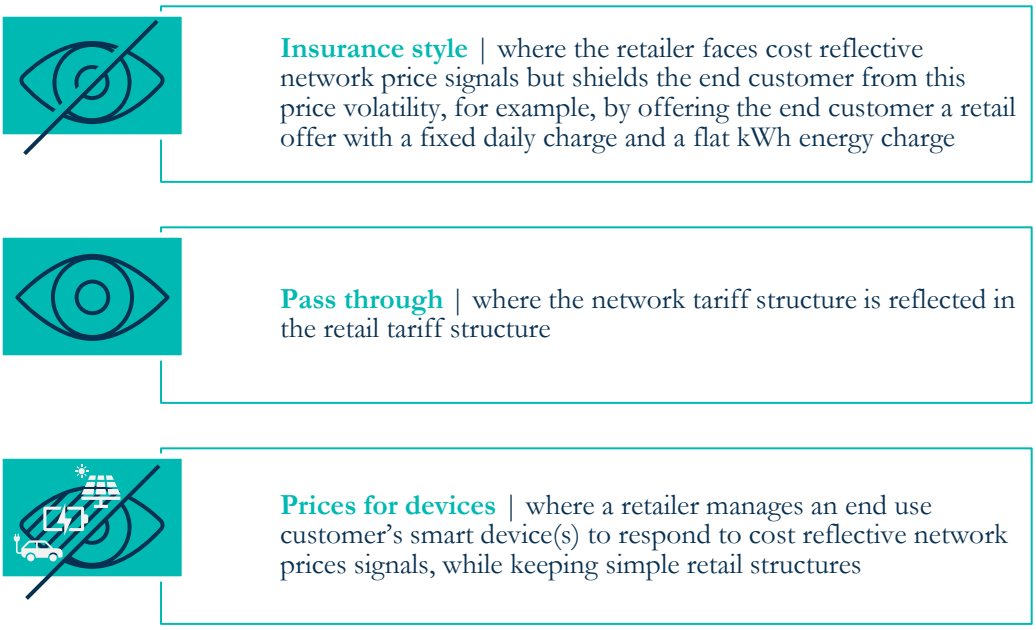
> *Our review of retail performance market update data shows that in Queensland 98.5 per cent of residential and small business customers are on a flat or block retail offer with no time-of-use price signals. The remaining 1.5 per cent of customers are on a time-of-use retail offer. In South Australia, 96.2 per cent of residential and small business customers are on a flat or block retail offer. The remaining 3.8 per cent of customers are on a time-of-use tariff retail offer.*[20]

The paper found that retailers categorised their offers into the three types shown in Figure 3.3, with:

- large retailers predominantly having flat tariff offers and stating that they are likely to retain these 'insurance forms' of retail tariff amid further cost reflective network tariff reform
- smaller retailers being more likely to adopt pass through forms of retail tariffs where networks have time of use structures, but not demand-based tariffs, and
- most retailers considered 'prices for devices' approaches still require further technology advancement before implementation at scale.

[20] AER, Understanding the impact of network tariff reform on retail offers, 2020, p.2.

Figure 3.3: Retailer categories of tariff design



Source: AER

(a) A flat retail structure which reflects an underlying flat network tariff is referred to as a 'pass through' offer. However, a flat retail structure with an underlying cost reflective / time-of-use or demand based network tariff is referred to as an 'insurance style' retail offer.

In our survey of the AEMC's technical working group members, a consumer representative questioned whether a timely transition to export pricing would be supported by separating network charges from retail charges on retail bills (e.g. as already occurs for many large users).

In South Australia, the government has established a new requirement that retailers must offer plans which reward customers for shifting electricity use to support the grid. These will incentivise energy use in low demand periods to support the intent of SA Power Networks' solar sponge tariffs.

3.2.2 Lower average prices

AEMC intent | *Lower average prices for consumers in the medium to long term as some consumers respond to the price signals*

Outcome so far | *Too early to assess, given most small customers do not face price signals yet and there are many other factors that affect average prices that may make it hard to identify any impact from tariff reform*

As we are only now entering the second round of TSS periods, it is likely too early to assess the achievement of this intent. That said, we note that the preconditions for this discussed above do not yet exist at scale. Until a significant share of customers are both assigned to cost reflective network tariffs and their retail tariff or new technology or services enables them to respond to the price signals, we are unlikely to see behavioural change of the kind needed to deliver system-wide cost savings that could then be reflected in lower prices.

This is not to say that customers are not experiencing lower average prices today than they had been at the time of the reforms. They are in most National Electricity Market (NEM) jurisdictions. However, rather than network tariff reform, this may be attributed to other factors such as:

- declining wholesale energy prices
- declining network revenues arising from an environment of historically low interest rates and low inflation
- introduction of default retail offer regulation

A third of our survey respondents identified the recent period of lower network costs as one of their top three contributors to success in the pace of network tariff reform – see Figure 3.4 below.

3.2.3 Customer protection through improved consultation and customer impact principles

AEMC intent | Improved consultation in the development of network tariffs. That the consultation requirements and customer impact principles address the potential for some customers to be negatively impacted

Outcome so far | Recognised success

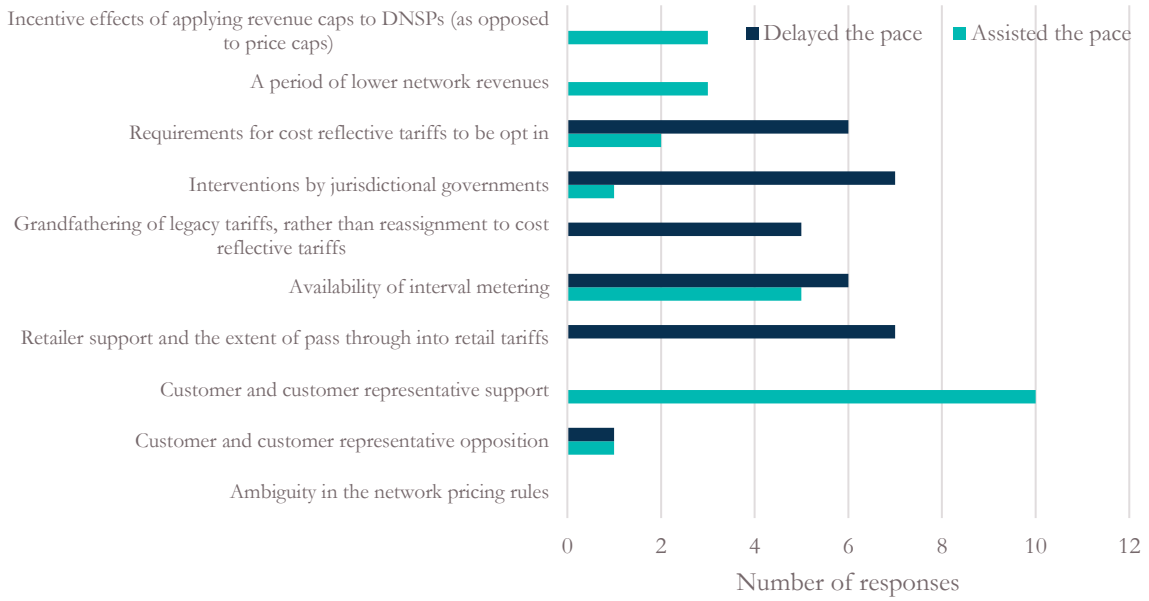
This aspect of the reform intent has been shown to have largely achieved its intent.

Improved consultation

As noted above and shown in Figure 3.1, engagement is starting on average 3 years before the commencement of the new TSSs and associated tariffs, it is involving a broad range of customers and stakeholders, and it is influencing tariff structures and arrangements for tariff transition.

We surveyed the AEMC's technical working group members about the top 3 factors that have supported and delayed the pace of transition to cost reflective tariffs. Figure 3.4 shows that customer and consumer representative support was the highest rated factor assisting the pace of reform and benefits realisation to date.

Figure 3.4: Factors which most affected the pace of transition and the level of benefits realisation

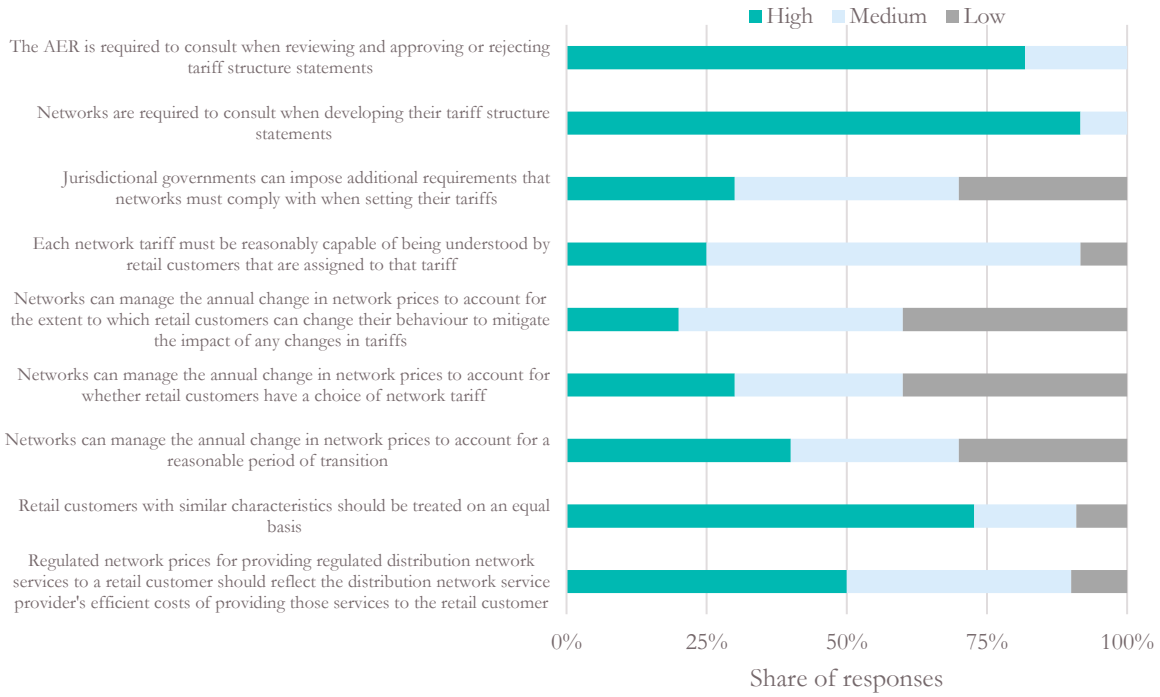


Customer impact principles

The current network pricing rules include various customer safeguards. We also surveyed how helpful the working group members considered the different pricing principles in the rules have been in protecting customer interests in TSS processes to date.

Figure 3.5 shows that the rule provisions rated most helpful were those requiring both the AER and DNSPs to consult customers and stakeholders.

Figure 3.5: Perceived relative contribution of different rules in protecting customer interests



3.3 LESSONS

A range of lessons can be gleaned from the experience of the first 2 TSS rounds and stakeholders' feedback on them. Below we describe these and note if they may be relevant to future TSS processes and pricing rule applications to export pricing.

3.3.1 Delays to tariff reform and benefits realisation

Figure 3.4 shows that the factors rated as most contributing to delay were:

- retailer support and the extent of pass through into retail tariffs
- requirements for cost reflective tariffs to be opt in
- interventions by jurisdictional governments
- the availability of smart metering.

Retailer support and the extent of pass through into retail tariffs

As section 3.2.1 explained, retailers are not passing on network tariff signals to small customers at any scale yet. Whether retailers pass on network tariff signals or engage with these price signals on their

customers' behalf will likely be a key determinant of the outcomes of export pricing reforms. We have therefore specified scenarios on this issue in section 4.3 and assessed these in sections 5.2 and 5.3.

A further potential issue is that the network pricing rules currently require application of pricing principles to '*retail customers*', including requiring that tariff structures are reasonably capable of being understood by retail customers. Whether this remains appropriate will depend on whether DNSPs should be designing tariffs to facilitate particular behaviours by end retail customers or by the intermediaries that supply them.

In our survey of the AEMC's technical working group members, a retailer also observed that pricing to retailers could see more innovative tariffs like locational or critical peak pricing that we have not seen at any scale to date:

> *Network tariffs are charged to individual customers. Transitioning towards a bulk wholesale network tariff approach (where the network tariff was aggregated and charged to the retailer based on the load profile of the retailer's portfolio in a particular location) would incentivise retailers to introduce locational and critical peak pricing because there would be a direct economic incentive to realise greater efficiency across the retail customer base.*

The five Victorian DNSPs also jointly consulted their customers and stakeholders on this issue in April 2018 during their TSS development for the 2021-26 period, reporting that:

> *we asked participants whether tariff structures should be targeted towards the retailer or the end customer. The preference of forum members was that end customers wishes should be kept in mind even if tariff structures are directed towards retailers. This recognised that it is the retailer's choice as to whether the network tariff structure is passed onto the end customer, but ultimately some end customer impact is likely.*[21]

and:

> *our customers, retailers and other stakeholders told us that tariff structures should be able to be understood and managed by both retailers and customers*[22]

There may be a case for revisiting this aspect of the pricing rules to enable pricing designs that also target retailers and energy intermediaries. This may support implementation of cost reflectivity and innovation in network tariff offerings where they are designed for business-to-business application. Drivers for considering this include:

- network tariff structures may need to get more complex (e.g. for export service or in a future two-sided market)
- network tariffs may be sending signals to intelligent energy control devices rather than seeking behavioural change from retail customers themselves
- large retailers have reported to the AER they will likely continue to package network tariffs into 'insurance style' retail tariffs[23]
- innovative retailers and energy service providers may need to package multiple energy service value-streams into a simplified retail offer, which could require network signals to be balanced and at times traded off against other supply chain costs and benefits to provide net tariffs and rewards to retail customers.

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21 CitiPower, Tariff structure statement - Explanatory document 2021-2026, January 2020, p.17.

22 CitiPower, Tariff structure statement - Explanatory document 2021-2026, January 2020, p.24.

23 AER, Understanding the impact of network tariff reform on retail offers, 2020, p.2.

Requirements for cost reflective tariffs to be opt in

This requirement was a feature of many round 1 TSS decisions by the AER and was mandated by the Victorian government during round 1 TSS.

Since then, the AER has required an opt out approach to tariff assignment and encouraged greater rates of reassignment to cost reflective tariffs for round 2 TSSs. The AER's current policy position on tariff assignment to cost reflective tariffs, as published in its recent TSS round 2 determinations, is that DNSPs should:

- *assign new customers to cost reflective tariffs upon initial connection, which would include a smart meter under current contestability rules*
- *reassign established customers to cost reflective tariffs when they upgrade their connections through either:*
  - *adding embedded generation or*
  - *upgrading to three-phase power*
- *reassign established customers who receive a new smart meter as part of a retailer's meter replacement programme.*[24]

The AER's policy positions on assignment further explain that:

- existing customers who receive a smart meter under a fault meter replacement program should be given a 12 month 'grace period' prior to cost reflective tariff reassignment to understand their consumption data and which structure may best suit them
- DNSPs can offer customers choice in cost reflective tariff, however DNSPs should no longer offer customers who are on a cost reflective tariff the ability to opt-out to anytime energy network tariffs, unless cost reflective tariffs are offered at a discount to incentivise take up
- the presence of binding retail price structure regulation is relevant to tariff reassignments—for example, in the Northern Territory (NT) where the NT government caps and subsidises flat retail electricity tariffs for small and medium sized customers, the AER permitted the DNSP's TSS to mandatorily reassign all customers who had a smart meter to a cost reflective network tariff in year one of their first TSS. Now NT retailers faces cost reflective tariffs from the DNSP but convert these to a flat tariff for customers under the NT regulatory arrangements. Also the presence of the Victorian Default Offer (VDO) is a key contributor to supporting the reassignment of customers on legacy tariffs to the new cost reflective options.

The Australian Competition and Consumer Commission (ACCC) has also supported moving to a mandated cost reflective network tariff assignment, stating in 2018 that:

> *The ACCC supports moves to accelerate the transition of small customers onto more cost reflective network tariffs. This is best achieved through mandatory assignment of cost reflective network tariffs on retailers under the next stage of tariff reform, for all customers with a smart or interval meter. With the retailer facing the cost reflective tariff, it is up to them to decide whether, and how, they pass those signals through to customers in retail tariffs.* [25]

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24 AER, Attachment 18: Tariff structure statement | Draft decision – SA Power Networks 2020–25, October 2019, Appendix B.

25 ACCC, Restoring electricity affordability and Australia's competitive advantage, Retail Electricity Pricing Inquiry Final Report, June 2018, p. 181.

The ACCC also recommended retail tariff measures to accompany this, which we discuss in section 6.2.4.

We further note the AER reported from its 2020 retailer engagement on network tariff reforms that:

> *Most retailers indicated they are unlikely to actively reach out to customers about other opt-in network tariffs which might be more suitable. Retailers did not see a benefit in moving customers when most customers are on a flat rate, noting it is too onerous to communicate with the customer.*
>
> *Unless the customer requests a change the retailer was unlikely to re-assign a customer. Retailers prefer to see a customer's load profile over time (3 to 12 months) before making a tariff re-assignment. Smaller more innovative retailers were the exception and commented that they actively try to pick the tariff that works best for the individual customer.*[26]

In our survey of the AEMC's technical working group members, a retailer observed that:

> *Networks could implement cost reflective tariffs in a more timely manner through next TSS and retailers could then manage how it is implemented vis-a-vis retail pricing. Consistency across network base charge structures would support retailers in managing risk by mitigating the cost associated with system build for bespoke tariff offerings in different jurisdictions (tariff rates could vary though).*

Given customers' bill outcomes are determined by retailer behaviour, a lesson may be that it is unnecessary and potentially counter-productive to the pace of tariff reform (including for export pricing) to have an opt in menu of network tariffs (or even potentially allowing opt out). Where choice in network tariff is offered, the lesson may be that choice should be limited to being among cost reflective tariffs.

This issue is also likely to be relevant for export pricing. The implications of the above lesson are that mandatory network tariff assignment with customer choice exercised at the retail level is likely to avoid customer harms whilst best supporting benefit realisation, and that benefits realisation may be aided where networks can design their tariff signals for retailers and intermediaries alone. We explore the form of transition for our scenario development in section 4.4.2.

Interventions by jurisdictional governments

Electricity is commonly viewed as an essential service, and accordingly it is unlikely that the exercise of setting pricing for this service will ever not be a topic of keen interest for policy makers and elected representatives.

In its submission to the AEMC's consultation paper for this export rule change, the Victorian Government has already stated that it does not support export charging.[27] This is notwithstanding the fact that Victoria is the only Australian jurisdiction with universal coverage of the smart meters needed to enable export charging and rebates.

Rule design and TSS scenarios will need to account for such interventions. We have therefore specified a scenario for this issue in section 4.3 and assessed this in section 5.1.

Recognising that such interventions have not always been timely in the past, it may be important to consider if there are regulatory mechanisms to ensure policy constraints are established at commencement of TSS engagement and development processes. For example, DNSPs and the AER could seek to test jurisdictional preferences as regards export pricing at the framework and approach stage of distribution determinations so that this can be accounted for in both service classification and TSS engagement.

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26 AER, Understanding the impact of network tariff reform on retail offers, 2020, p.6.

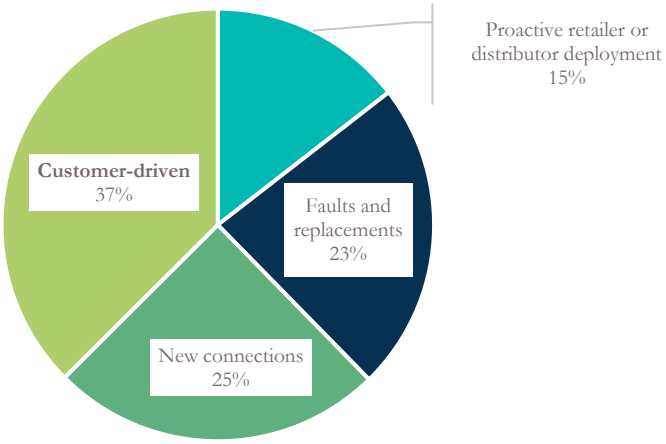
27 Department of Environment, Land, Water and Planning, Submission to AEMC, 25 September 2020, p.1.

The availability of smart metering

While availability of smart metering may have been an impediment to consumption-based tariff reform, this will not be the case for export pricing and does not require scenario testing.

Customers who connect exporting DER to a DNSP's system (such as solar PV panels) are required to have a smart meter in order to access feed in tariffs. In fact, retailer performance data reported by the AER shows that in 2019 customer driven replacements (almost all of which appears to be due to solar PV installation) were the largest driver of smart meter installations. A consequence of this metering configuration for DER customers is that they are also more likely to already be assigned to cost reflective network tariffs than other customers.

Figure 3.6: Meters installed in 2019 by reason (NEM excluding Victoria)



Source: AER retailer performance data 2019-20 Q2

3.3.2 Lessons on the role of and approach to attributing and reflecting costs in network tariffs

What do the rules require?

Two key pricing rules place obligations on how DNSPs set their tariffs:

> ***Clause 6.18.5 (f)*** | *Each tariff must be based on the long run marginal cost of providing the service to which it relates to the retail customers assigned to that tariff …*

> ***Clause 6.18.5 (g)*** | *The revenue expected to be recovered from each tariff must: (1) reflect the Distribution Network Service Provider's total efficient costs of serving the retail customers that are assigned to that tariff*

It is also notable that the LRMC principle does not prescribe a methodology for calculating LRMC and instead clause 6.18.5(f) requires:

> *'the method of calculating such cost and the manner in which that method is applied to be determined having regard to:*
>
> *(a) the costs and benefits associated with calculating, implementing and applying that method as proposed;*
>
> *(b) the additional costs likely to be associated with meeting demand from retail customers that are assigned to that tariff at times of greatest utilisation of the relevant part of the distribution network; and*

(c) the location of retail customers that are assigned to that tariff and the extent to which costs vary between different locations in the distribution network.'

What has been the experience?

As discussed above, the main focus of tariff structures to date has been on the extent to which costs vary depending on the time of day under clause 6.18.5(f)(2). In practice, very little regard has been had to locational issues despite the requirements of clause 6.18.5(f)(3). Some jurisdictions require uniform state-wide pricing for small customers, but that is not a legal requirement in all states and territories.

In practice, the cost estimation rules have necessitated extensive cost modelling and estimation by DNSPs. Such modelling invariably relies upon the exercise of judgement and assumptions in how costs are estimated and attributed. While DNSPs face a separate absolute constraint of not recovering more total revenue from their tariffs that is provided for in their AER determination (clause 6.18.5(g)(2)), neither LRMC or efficient costs of serving the retail customers assigned to a given tariff must necessarily rely on the costs underpinning the AER's determination. For example:

- LRMC is both long run and marginal, whereas the building block revenues determined by the AER are more akin to average costs over an upcoming five year forecast period
- incentive scheme revenue adjustments and recovery of jurisdictional scheme amounts can cause DNSPs' allowed revenue to depart from their efficient costs of supply.

So, what has been the value arising from the use of these economic cost concepts and the associated compliance estimation and modelling to date? Various stakeholders have commented on this.

The AER submitted:

the pricing principle to base tariffs on long run marginal cost might be more adaptable to emerging issues (e.g. minimum demand) if it referenced cost drivers in general, rather than cost drivers associated with times of greatest network utilisation[28]

Responses to our DNSP survey identified various issues as set out in Table 3.3.

Table 3.3: Issues experienced with LRMC estimation

DNSP(s)	Issues reported
AusNet Services	There is not a consistent stakeholder understanding of these economic concepts (which is reasonable as they are complex and can be hard to reconcile to tariff levels). Can (and has) lead to confusion/ inefficiencies in the engagement process.
CitiPower, Powercor, United Energy	We spent [money] on estimating LRMC using analytics to estimate the LRMC for each zone substation area. This included repex. There were many methodological decisions that has to be made. Altering just one methodological assumption could change LRMC by orders of magnitude. We had one stakeholder [consulting firm] tell us our LRMC was much too low and another [consulting firm] telling us it was much too high. Too much discretion is provided in calculating LRMC rendering it useless.

[28] AER, AER submission on consultation paper: Distributed energy resources integration – Updating regulatory arrangements, 10 September 2020, p.7.

DNSP(s)	Issues reported
Evoenergy	A key issue was accessing network data to calculate the LRMC. Also, given the concept of 'basing tariffs on LRMC' was a new rule (part of Power of Choice), we engaged a consultant to help convert LRMC to prices, and to calculate residual costs.
Endeavour Energy	No significant issues. The AER accepted Endeavour's economic cost concepts inclusive of repex in the calculation of LRMC and a longer time horizon for data inputs to the calculation.
Ausgrid	A key challenge when estimating LRMC was that we had pockets of growth in the network but more modest growth in demand at a network level. This complicates estimating LRMC using the average incremental cost methodology (at a network level). The incorporation of replacement expenditure into the LRMC calculation was also a new addition in the 2019-24 TSS, following the AER's feedback from round TSS1.
SA Power Networks	• Due to the complexity and resource intensive nature of quantifying LRMC, we employed an external consultant. • In practice, judgement has been employed in the approach to recovering residual costs (i.e. which tariff components to use), noting that the NER are not prescriptive and recovering all residuals (given their magnitude for consumption services) from fixed tariffs alone (as implied by economic theory) would likely have undesirable outcomes for customers – and was also not supported by customers and stakeholders. • Otherwise, the economic cost concepts were readily understood and their application fairly straightforward.
Essential Energy	AER advised too much repex included.
Energex, Ergon Energy	Challenges of determining LRMC values and including LRMC within tariff structures alongside customer impact principles.

Source: DNSP TSS survey Dec 2020-Jan 2021.

Insights for export pricing

The extent to which DNSPs are required or permitted to estimate and allocate certain costs to export pricing could affect the efficacy of the reform, the extent of customer price impact, regulatory burden in implementing export pricing and potentially whether transition is or is not needed in the level of any export prices. We have therefore included this issue in our scenario design in section 4.3, with particular focus on the allocation of residual costs as this is likely the most material driver of customer impact.

There are however a range of other foreseeable issues that could arise for export pricing if the manner of introducing export prices ends up requiring export charging parameters to have to be based on an estimate of the LRMC of export services. These issues include:

- **Short-run prices** | Whether DNSPs will be permitted to provide short-run price for exports (e.g. negative prices, critical peak prices). Our working group survey revealed no examples of critical peak pricing for small customers. This may be unsurprising as critical peaks are more likely to be the result of short-term network constraints and thus would not be priced at LRMC.
- **Locational export signals** | Whether DNSPs will be required or permitted to send locational export signals. Like consumption services, the costs and benefits of exports will necessarily be locational. But

we have seen very limited use of locational pricing in consumption-based network tariffs, beyond the broad differentials for CBD, urban and rural network areas.

- **Export payments** | Whether both export charges and payments are envisaged and whether further guidance should be provided on how any payments to the customer should be set, e.g. based on the reduction in long run marginal cost, permitted to reflect more short-term network cost constraints or able to simply be priced at a level that provides customer incentive.

Together these points suggest that applying this LRMC rule to export charging parameters could add compliance cost and further imprecision to LRMC estimates for limited benefit given LRMC estimates are already imprecise, potential benefit of short-run signalling and scope for other binding jurisdictional or customer preference requirements to drive prices below this economic cost concept.

We have not considered this issue further in our scenario design because:

- we have identified methods of export pricing introduction that could overcome the need to comply with this rule for export charging parameters (see section 4.2.3)
- there was little support for this change from members of the AEMC's technical working group and two DNSP members of the working group strongly supported retaining symmetry in applying LRMC-based pricing to both consumption and export charges.

We note that the rules already provide a degree of discretion as to how LRMC is calculated and applied in tariff design (e.g. in clauses 6.18.5(f) and (h)). However, if the AEMC wanted to avoid any doubt over the above issues, it could clarify them in the rules, including through the clarifications discussed in section 6.2.2 or guardrails for the exercise of discretion in how LRMC is used in export pricing could be clarified in AER guidance.

3.3.3 Export pricing-based versus consumption-based reforms

When looking to draw from insights on TSS processes for consumption-based pricing and stress test the network pricing rules for export pricing, it is important to recognise key differences of export pricing relative to consumption pricing.

Several key differences exist:

- *Not all customers will seek export services* | Not all electricity customers will seek an export service from their DNSP. This may mean export services have less of the 'essential service' characteristics that are commonly considered to apply to electricity consumption services, and may warrant testing on the role and form of customer impact principles in pricing export services.[29]
- *Charges do not apply to existing exports* | Existing customers with distributed generation have not needed to pay for export pricing to date, and have in many jurisdictions received mandated export subsidies in the form of feed in tariffs set by jurisdictional governments or jurisdictional regulators. This may require consideration in either the pace of transition or grandfathering arrangements.
- *Competition between distribution and transmission generation* | Large distributed generators (e.g. registered generators over 5MW in size that are connected to the distribution network) may compete with transmission-connected generators, and presently transmission-connected generators are not required to pay for on-going use of the transmission network. This has led some stakeholders[30] to express

[29] For example, clause 6.18.5(h)(3) in the customer impact principles allows departure from cost reflective tariffs based on 'the extent to which retail customers are able to mitigate the impact of changes in tariffs through their usage decisions'. This may be warranted where usage decisions involve an 'essential service' for electricity consumption, but not where those decisions involve a discretionary export of electricity that is superfluous to a customer's energy needs.

[30] See for example, submissions to the AEMC's issues paper from the Victorian Government, Solar Citizens, Australia Institute, Major Energy Users, Tesla, and CSR.

concern about competitive neutrality for large generators who participate in the wholesale electricity market.

- *Smart meter required already* | Export pricing is only possible where a smart meter is installed. This means customers who seek export services are more likely to already be on a cost-reflective network tariff for the consumption-based charges.

These points of difference between electricity consumption services and export services are an important consideration in later sections of this paper, particularly section 6.

4. Looking forward | What are the key scenarios?

This section identifies scenarios for how the export pricing could be implemented under the TSS process and how the transition to export prices could be managed to mitigate potential consumer harms. These scenarios are then used in section 0 to test the TSS process and pricing rules outcomes for each scenario.

This section starts by identifying the key benefits available from export pricing and what it would take to realise these benefits in section 4.1. It then works through key export pricing considerations to scope threshold scenarios in section 4.2. In doing so, it explains why some approaches that are potentially permissible under the rules have not been considered in the scenarios. The reasons for excluding these approaches relate to lessons from the TSS process to date, the likely difficulty or regulatory burden in implementing those alternative approaches, or their applicability only to large customers.

This section then provides the summary of scenarios and their specifications in section 4.3, before explaining a range of customer considerations that are relevant across multiple scenarios in section 4.4.

4.1 WHAT BENEFITS ARE AVAILABLE FROM EXPORT PRICING?

The AEMC has identified three limbs to the proposed export pricing rule changes:

1. *Updating the framework* | Proposals that seek the explicit recognition of export services by updating service definitions and adding new obligations and planning requirements on DNSPs
2. *Aligning incentives* | Proposals that export services should be subject to incentive schemes to align incentives, e.g. the STPIS could be amended apply to export services
3. *Allowing price signals* | Proposals to enable pricing tools for export services.

These limbs support the efficiency of DER integration and electricity service provision in different ways and can therefore be expected to provide different benefits if implemented.

At a high level, updating the framework and aligning incentives will support *productive efficiency* in the provision of distribution network services by encouraging DNSPs to provide bi-directional network use of system services to desired service levels at least cost.

In theory, sending export pricing signals should support *allocative efficiency* by:

1. signalling to customers using grid export services the cost of providing these services, which should encourage them to use an efficient amount of those export services, and
2. reducing the extent to which consumption services are subsidising export services, and thereby avoiding any inefficient distortion of customers' electricity consumption decisions.

Depending on how they are implemented, export price signals could also support *productive and dynamic efficiency* by rewarding customers using grid services for exporting energy at times and in locations where doing so has the most value to the network and helps reduce network costs, and improving how exporters integrate their behaviour with the energy system and markets.

It is important to note that realising these potential export pricing benefits is dependent on:

- *Retail price signals* | Any improvement in the efficiency of how export services are used requires that customers using those services face the price of doing so. This would require that those customers' retailers pass on the network export pricing signal in some manner. As discussed in section 3.3.1, we have not seen this for cost reflective network tariff reforms to date, and retailers have told the AER they do not propose to change this for more complicated network tariff reforms like demand charges at this stage – AER staff expect this to change as the proportion of customers assigned to cost reflective tariffs grows.
- *Elasticity of demand* | The extent to which consumption services subsidising export services creates any economic inefficiency will depend on how price-responsive demand for consumption services is. Likewise, the scale of the benefit of behavioural change in how much and when customers export will depend upon how price-responsive demand for exports is.

Neither of these factors can be controlled through the NER provisions that are the subject of these rule changes.

4.2 NETWORK PRICING AND COMPLIANCE CONSIDERATIONS

The following section describes considerations for scenarios to test. Each consideration is described, its impact or handling identified, and where relevant the scenario specification to test it is explained. For some scenario variants where the outcome is clear or likely to only be relevant to large users, we note the outcome here and do not consider it further in the scenario specification and analysis.

4.2.1 Scope of the export service(s)

DNSPs must specify the scope of the export service or services they will provide and charge customer to use. DNSPs cannot price something in a TSS without clarity on the scope of the service being priced, e.g. because they cannot assess the efficient cost of providing that service absent such a scope.

The scope of export services may differ by customer type or location, and could involve a menu of options. Key considerations DNSPs, and the customers, retailers and other stakeholders they engage with, will face in their TSS development processes are considered below.

Nature of the export service

The nature of the export service(s) being provided will affect the costs of providing the services, the attractiveness of the service to customers and potentially any benefits the DNSP derives from customers taking up the service. This is analogous to how a controlled load consumption service for hot water heating has a different firmness of capacity access for the customers and control vested to the DNSP in return for these customers being offered discounted tariffs relative to non-controlled load tariffs.

Key factors that affect the nature of the service will include whether the export service has a static or dynamic constraint on the amount of export capacity, whether there is only a single service for all exporting customers or a range of services and associated prices that customers can choose from, and whether the DNSP can call upon the customer to increase or reduce exports at certain times for network support.

Transitional considerations will be much more important if there will be a single export service and tariff that must be paid by all customers with embedded generation. In contrast, transitional issues are likely to be less of a concern if customers can choose whether to have the current non-firm level of export at no additional charge or buy an optional service with a higher or firmer export capacity.

A potential scenario that captures how the nature of the service could be implemented involves an export tariff structure that has different charges for different forms and scales of export.[31] An example would be a tariff structure with:

- *Static limit exports block 1* | Low or no charge for exports up to a specified limit based on either the average existing static limit applied by that DNSP for customers of that type or the existing intrinsic capacity currently provided to customers of that type or location
- *Static limit exports block 2* | A (higher) charge for permitted exports purchased between block 1 and a specified export cap
- *Dynamic control customer initiated exports* | An incentive-based charge for exports above block 1 set at a price lower than block 2 for variable export capacity provided through a dynamic operating envelope
- *Dynamic control DNSP initiated exports* | An incentive rebate (negative tariff) paid to customers to export in specified circumstances or when called upon by the DNSP.

This scenario could be labelled a '***transition from entitlement***' tariff structure. If the block 1 tariff was set at zero up to a threshold of the customers' current static export limit or intrinsic capacity presently provided, then it could negate the need for any transitional measures in the tariff implementation as there would be no negative impacts on existing export customers compared with the current arrangements. This is because the customers would only incur export charges for making a choice to buy more export services (be they firm or dynamic services) than they are able to obtain under their current connection arrangements.

The downside of this approach would be that it would not enable an efficient reallocation of existing costs between consumption and export services if there are any excessive or inefficient current cross-subsidies between those services.

Consistent with current arrangements for access by generators to distribution and transmission networks, the optional services with higher levels of exports would not provide 'firm' access to the network for exports or a 'guaranteed' level of exports. The level of certainty as to whether a customer would be able to export up to the export limit at any time, and the consequences if it was unable to do so, would primarily be a matter to be addressed in connection arrangements and DNSPs' standard terms for this service. Similar to current broadband products, consumer laws may also be relevant if customers paid more for an optional export service but were regularly unable to achieve the advertised level of service. State and territory guaranteed service level schemes do not currently apply to export services.

Who sells export services to retail customers and what does this mean for designing network tariffs

DER export customers necessary procure their network export services via an intermediary (e.g. their retailer) rather than directly from the DNSP. While some jurisdictional schemes for feed in tariffs are paid by distributors to a customer's retailer, it is ultimately the retailer who determines how much the customer is paid or pays for their exported electricity. This allows customers to shop around for the electricity supply agreement that best suits how and when they source, use and export energy. Customers can also buy services from their retailer or third party service providers to help them manage their costs, e.g. a

[31] We note that it is also theoretically possible for there to be a range of services (like those in this scenario) with different service classifications applying to each service, e.g. a basic entitlement for all customers with a lower export limit that is part of the SCS, and an optional service that is an ACS or negotiated service and has a higher or firmer export capacity or is subject to dynamic control and payments and rewards. We have not considered this scenario further because the additional complexity and transaction costs of implementing it make it unlikely for smaller retail customers with DER like households and small and medium enterprises.

retailer may pass through the DNSP's time-of-use network charges but the retailer or a third party may provide demand management services to help the customer minimise its exposure to peak prices.

This has several implications for network tariff design:

- Firstly, and as widely recognised, customer impacts will be determined by retailers' decisions about retail tariff structures and levels rather than the decisions of DNSPs
- Secondly, some more complex export service offerings such as those with dynamic controls, may be bundled into retail electricity packages or third party aggregator service offerings where the pricing and signalling to control, encourage and reward dynamic behaviours for network export capacity availability and network support are packaged with other wholesale market drivers such as demand response.

As already noted in section 3.3.1, the network pricing rules currently require the application of pricing principles to retail customers, and there may be a case for revisiting this aspect of the pricing rules to enable pricing designs that also target retailers and energy intermediaries.

4.2.2 Service classification

You cannot apply a TSS process without knowing the service classification, and from a process perspective when this would be determined (e.g. by the AER in an earlier framework and approach paper) or prescribed in the NER. Only services classified as direct control are subject to the TSS process.

All DNSPs are currently subject to a revenue cap form of price control for standard control services (SCS), which covers their distribution use of system or 'DUoS' services. Compared to the price cap form of control also available under the NER, revenue caps mean DNSPs do not face a revenue incentive to grow demand for their services and do not face demand risk in the provision of their DUoS services during the regulatory period.

We explore several possible export service classification options below, before explaining which we have adopted for scenario assessment purposes.

Augment the existing SCS DUoS service

In this scenario, the AER would classify[32] export services as part of the existing DUoS standard control services and continue to apply a revenue cap to them. Under this scenario:

- DNSPs will need to include these services and their tariff structures in the TSS and apply the network pricing objective and principles in the NER
- DNSPs will have the price setting options and applicable SCS pricing rules described in section 4.2.2
- DNSPs would not have any disincentive for paying export rewards to customers for exporting at times and locations that provide network benefits
- DNSPs will not have a revenue incentive to introduce export charges, encourage uptake of export services or design tariffs and transitional measures that aim to maximise the number of customers that are subject to export prices in the short-term
- The AER and DNSPs would not need to separate the costs of providing export service from the costs of providing existing consumption-based DUoS services
- DNSPs would not face any revenue demand risk from providing export services, but would face cost risk where say a higher demand for export services than forecast causes costs to exceed those approved in the AER's distribution determination.

[32] This would occur via the service classification and form of control positions in its framework and approach for the next round of price reviews and then be finalised in the determinations.

Establish a new SCS service for exports

In this scenario, the AER would classify export services as a new standard control service and determine the form of price control to apply to these export services. Under this scenario:

- DNSPs will need to include these services and their tariff structures in the TSS and apply the network pricing objective and principles in the NER
- The AER and DNSPs would need to separate the costs of providing export services from the costs of providing existing consumption-based DUoS services. While this would add some complexity, it may not be materially more complex than existing cost collection and attribution that is already done for alternative control service (ACS) services for some metering services and public lighting. Shared costs would be shared in accordance with their cost allocation methods (CAMs). DNSPs may or may not need to update their AER-approved CAMs to support this approach.
- The AER would need to determine whether to apply a price cap or a revenue cap to export services.

Establish a new alternative control export service

In this scenario, the AER would classify export services as an ACS and apply a price cap to them. Under this scenario:

- DNSPs will need to include these services and their tariff structures in the TSS and apply the network pricing objective and principles in the NER. However, we note that while ACS have been included in DNSPs' AER-approved TSSs to date, neither DNSPs nor the AER have sought to test how ACS comply with the network pricing objective and principles in the NER (e.g. rules for the efficient pricing bounds, LRMC pricing, and customer impact principles have generally not been applied to ACS to date, however ACS have been included in DNSPs' customer engagement for developing their TSSs and proposed ACS pricing)
- The AER and DNSPs would need to separate the costs of providing export services from the costs of providing existing consumption-based DUoS services, similar to in the option discussed above.
- DNSPs may face a market making incentive to increase sales of these services beyond what was forecast in the reset process.

Establish a new negotiated export service

There may be scope for service classification to vary by customer or generation size. Customer segmentation through service classification could provide for more bespoke export service, connection options and pricing outcomes[33] for large scale distributed generators that connect to a DNSP's network.

In this scenario, service classification would vary for different types of customers. There could be:

- an SCS classification for smaller customers, e.g. all customers with non-registered generation connected under Chapter 5A or alternatively only those customers with a Chapter 5A 'basic connection service', and
- a negotiated service classification for larger generation connections, if the rule change applies to them.

Under the large export user negotiated service element of this scenario:

[33] We note that presently connections can be negotiated connections without needing to be classified as negotiated services—i.e. standard control services connections can be basic, standard or negotiated. Together with the provision in some DNSPs' TSSs for individually calculated DUoS tariffs, some of this flexibility could be achieved within an SCS classification. However this would still require AER approval of the individually calculated tariffs through the annual pricing proposal, and would have less flexibility or timeliness than a negotiated service offering.

- DNSPs will negotiate with large users under their AER-approved negotiating framework, with any disputes being subject to the dispute resolution arrangements in the NER
- DNSPs would not need to include the large user service in their TSS nor demonstrate compliance with the pricing principles for this large customer cohort, thereby enabling greater flexibility in the export service offerings and in negotiating arrangement that also include tailored network support from these large generators
- The AER and DNSPs would need to separate the costs of providing large export user export services from the costs of providing existing consumption-based DUoS services and small customer export service, or a cost or revenue allocation approach such as that used for shared assets or for connection services could be employed for simplicity
- DNSPs may face a market making incentive to increase sales of these services beyond what was forecast in the reset process.

Establish a new unregulated export service

While it is possible for the AER to instead classify export services as unregulated services, we consider this unlikely, given:

- DNSPs are monopoly providers of the export service[34]
- no pricing rules or customer impact principles would apply to how DNSP's price export services under this scenario
- the challenges of cost attribution and allocation noted above (which may be overcome by treating them in accordance with the AER's shared asset guideline)
- the potential impracticalities of implementing ringfencing for export services.

Implications for scenarios

While we have flagged a range of options above, all our proposed scenarios have relied upon the option of ***augmenting the existing SCS DUoS service***. This option has the most straight forward pathway to implementation whilst also enlivening the pricing rules (including customer impact principles) which this insights report seeks to stress test.

This approach is also consistent with an initial AER staff view that SCS is an appropriate classification, most consistent with the rule changes' focus on small customers, and the requested focus of this insights report on potential impacts on small customers.

The next section considers options for how this service classification could be implemented to further specify our *augmenting the existing SCS DUoS service* approach for the purpose of scenario assessment.

4.2.3 Pricing structure options that affect applicability of pricing rules

Within an augmented DUoS service that includes exports, there are several ways that pricing for this service could be implemented. These centre around whether the export pricing is implemented through:

- a new tariff class
- new tariffs, or
- additional charging parameters added to existing tariffs.

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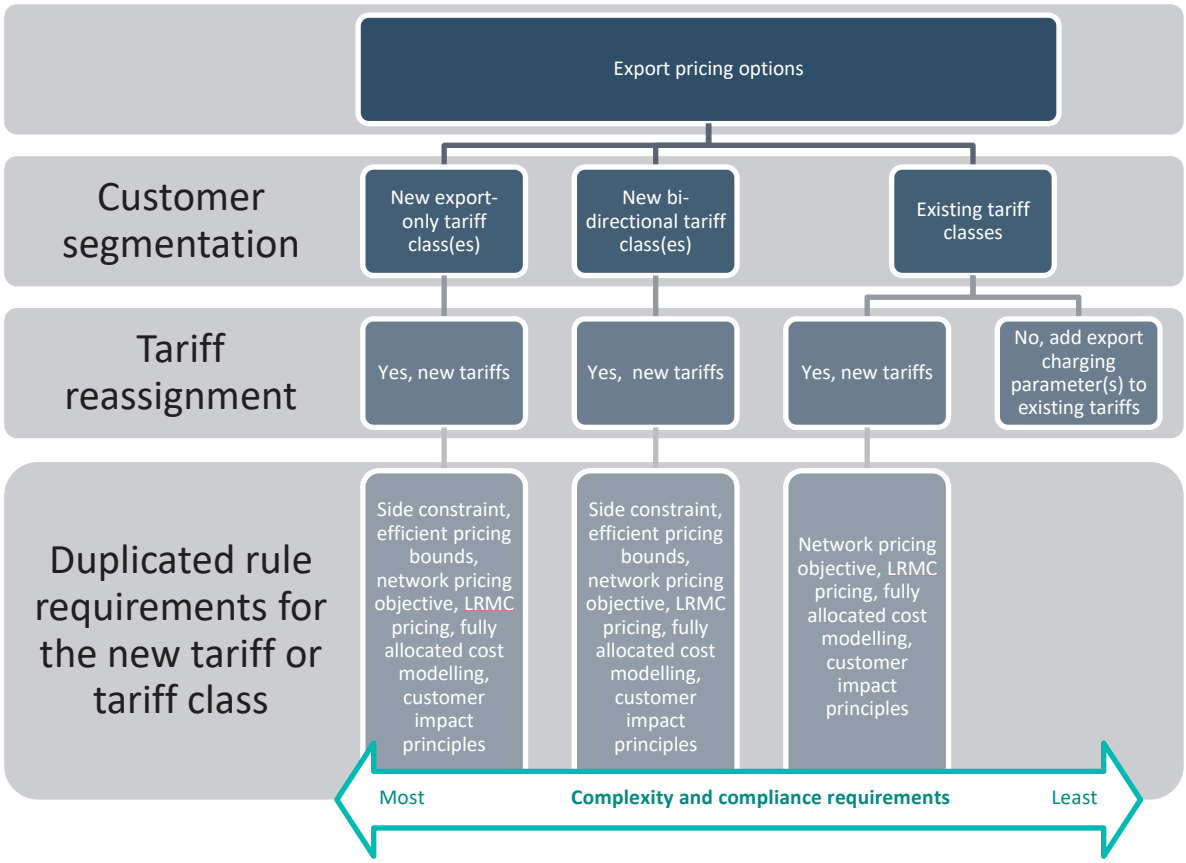
[34] Alternative means of customers sharing their excess energy are currently generally uneconomic for small customers by comparison to a network export service (e.g. charging portable batteries, or creating portable green hydrogen).

As shown in Table 2.1, these different approaches will affect which pricing rules DNSP's must demonstrate compliance with.

In Table 4.1 we map the implications for rule application,[35] and summarise the resulting complexity and regulatory burden on the AER and DNSPs in Figure 4.1. The key take-outs from this table are that:

- several key requirements apply in all options, including:
  - customer consultation by DNSPs and the AER, which the technical working group survey identified as the two most important customer safeguards in the TSS process
  - DNSPs not recovering more revenue than the AER allows
  - DNSPs recovering residual costs across all tariffs and charging parameters in a way that least distorts the price signals for efficient usage of the DNSP's services collectively (i.e. not for each export, bi-directional or consumption only services)
  - tariff structures must be capable of being understood by the customers assigned to those tariffs
  - compliance with all rules and regulatory instruments including those set by states and territories
- the least complex introduction of export pricing is to add export charging parameters to existing tariffs.

Figure 4.1: Summary of rule implications for different export pricing options



[35] As Table 2.1 shows, some rules would apply to all export pricing options. These include: clause 6.18.5(g)(3) recovering residual costs from those customers and charging parameters least likely to distort efficient use of the network services; clause 6.18.5(j) compliance with all rules and regulatory instruments including those set by states and territories; clause 6.8.2(c1a) requirements for overview paper to accompany the proposed TSS; clause 6.9.3 requirements for AER consultation on the proposed TSS.

Table 4.1: Mapping compliance requirements to pricing options

Rule requirement	New export only tariff class(es) & new export tariffs	New bi-directional tariff class(es) & new bidirectional tariffs	Existing tariff classes & new bidirectional tariff(s)	Existing tariff classes and tariffs, with new export charging parameter
Tariff /tariff class reassignment	Yes	Yes	Yes	No
Compliance with efficient pricing bounds	Needs to be done separately for export tariff class and consumption tariff classes	Needs to be done separately for bi-directional tariff class and consumption tariff classes	Update current cost estimates for new service definition	Update current cost estimates for new service definition
Side constraint	Applies separately to export tariff class and consumption tariff classes (therefore greatest constraint on annual movements in export revenues)	Applies separately to bi-directional tariff class and consumption tariff classes (therefore lesser constraint on annual movements in export revenues)	Status quo application	Status quo application
Network pricing objective	Applies separately to both export tariffs and consumption-only tariffs	Applies separately to both bidirectional tariffs and consumption-only tariffs	Applies separately to both bidirectional tariffs and consumption-only tariffs	Status quo application, with costs updated to include export services
LRMC pricing	Applies separately to both export tariffs and consumption-only tariffs	Applies separately to both bidirectional tariffs and consumption-only tariffs	Applies separately to both bidirectional tariffs and consumption-only tariffs	Status quo application, with costs updated to include export services. If export services are not driving DNSPs' marginal costs in the long-term, then no change to current compliance demonstration
Fully-allocated cost	Applies separately to both export tariffs and consumption-only tariffs	Applies separately to both bidirectional tariffs and consumption-only tariffs	Applies separately to both bidirectional tariffs and consumption-only tariffs	Status quo application, with costs updated to include export services

Rule requirement	New export only tariff class(es) & new export tariffs	New bi-directional tariff class(es) & new bidirectional tariffs	Existing tariff classes & new bidirectional tariff(s)	Existing tariff classes and tariffs, with new export charging parameter
Customer impact principles	Applies separately to both export tariffs and consumption-only tariffs	Applies separately to both bidirectional tariffs and consumption-only tariffs	Applies separately to both bidirectional tariffs and consumption-only tariffs	Status quo application
Customer understanding principle	Applies separately to both export tariffs and consumption-only tariffs	Applies separately to both bidirectional tariffs and consumption-only tariffs	Applies separately to both bidirectional tariffs and consumption-only tariffs	Status quo application with requirement to ensure new charging parameters are understandable
Residual cost recovery	Subject to fully allocated cost compliance hierarchy, DNSPs retain flexibility to recover residual costs across all tariffs and charging parameters in a way that least distorts the price signals for efficient usage of the DNSP's services collectively (i.e. not for each export, bi-directional or consumption only services)			

Below we consider each pricing option in more detail and the implications for rule application (including consumer protections) and regulatory burden on the AER and DNSPs.

Establishing new export tariff classes

In this option, DNSPs could establish one or more export service tariff classes. These tariff classes would either:

1. *Variant 1* – comprise only the menu of tariffs that relate to export services, or
2. *Variant 2* – create one or more dedicated tariff classes for customers who require a bidirectional DUoS service.

The unique pricing rules that apply under this option and insights comments on these are set out in Table 4.2. Also, because any new tariff class option would also require a suite of new tariffs within that tariff class and reassignment of customers to those tariffs, all of the rules from the 'establishing new export or bidirectional tariffs' option will also apply to this option. These are set out below in Table 4.3.

Table 4.2: Pricing rules that would apply to the export tariff class option

Rule requirement	Insights
Retail customers with a similar connection and usage profile should be treated on an equal basis *Clause 6.18.4 Assignment to tariff classes*	• The rule may require amendment to include export characteristics • This option of dedicated export tariff class(es) would allow export customer segmentation to occur independently of how they are segmented for their consumption service
Retail customers with micro-generation facilities should be treated no less favourably than retail customers without such facilities but with a similar load profile *Clause 6.18.4 Assignment to tariff classes*	• This rule would be removed if the rule change is made

Rule requirement	Insights
Retail customers in a tariff class should not collectively be charged more than the standalone cost of supplying that group of customers or less than the avoidable cost of supplying that group of customers *Clause 6.18.5(e) Efficient pricing bounds prohibit uneconomic levels of cross-subsidy between tariff classes*	• The AER and DNSPs would face additional regulatory burden to apply these economic cost concepts to export services (variant 1) and bidirectional services (variant 2) on a standalone service basis. • Given the significant joint use of consumption-based service assets and operating activities, and shared use of these across multiple tariff classes, DNSPs would be expected to have significant headroom when demonstrating compliance with the standalone cost rule. Therefore, this rule is unlikely to provide any significant customer protection for the regulatory burden it would create. • During the transition to export pricing, there may be a case for export services to be priced below their avoidable cost, which could make this rule undesirable under variant 1, although the customer impact principles allows a departure from this rule as part of the transition process if necessary to manage the impacts of price changes on customers.
Annual change in revenues cannot exceed 2% above inflation and the allowed annual total revenue growth (in real terms) determined by the AER for the DNSP's standard control services *Clause 6.18.6 side constraint*	• A dedicated export tariff class (variant 1) would make this constraint binding on export service revenues. Such a constraint on annual revenue movements could impede the pace of transition if DNSPs need to rebalance their tariffs towards higher export prices over time rather than start them at their desired/efficient levels from day 1. • This constraint would affect variant 2 to a lesser extent as the DNSP could rebalance within a tariff class larger revenue base that includes revenues from consumption-based charging parameters.

Under variant 1 of this option, DNSPs would have to assign customers who have bi-directional demand (i.e. who require both consumption and export services) to two tariff classes. Under variant 2, all customers with an export service would need to be reassigned from their current tariff class.

The rules governing how DNSPs establish tariff class state that these must be constituted with regard to:

- the need to group retail customers together on an economically efficient basis, and
- the need to avoid unnecessary transaction costs.[36]

Given the availability of two simpler options for establishing export prices (discussed below), the transaction costs of having two assigned tariff classes or requiring mass tariff class reassignment for existing export customers, and the additional regulatory and pricing administration burden of this multi-tariff class option, this option may offend the transaction cost rule. We do not consider that this additional burden would better manage potential consumer harms or otherwise result in improved consumer outcomes. We therefore consider this option unlikely to be pursued by DNSPs and have not relied upon it further in our scenario analysis.

[36] Clause 6.18.3.

Establishing new export or bidirectional tariffs

In this option, DNSPs could:

1. *Variant 1* – establish one or more export service tariffs in a dedicated export tariff class. These tariffs would comprise all the charging parameters applicable to an export only service, or

2. *Variant 2* – establish one or more bidirectional service tariffs in a dedicated bi-directional tariff class (*variant 2a*) or in existing tariff classes (*variant 2b*). These tariffs would comprise all the charging parameters applicable to a bi-directional DUoS service, including any export charging parameters.

The pricing rules that apply under this option's variants and our insights comments on these are set out in Table 4.3. All these variants would require a tariff reassignment for existing customers who currently have DER exports. This would enliven the existing customer protections for tariff assignment and would require a decision (by the DNSPs and AER in TSS approvals, or the AEMC in its rule determination) about whether current export customers can choose to remain on a consumption-only tariff. If it is not mandatory to be reassigned to an export or bidirectional tariff, the benefits of the reform will not be maximised.

Variants 1 and 2a would both also involve the regulatory burden created though the new tariff class options set out in Table 4.2. We therefore consider that variant 2b is the more likely variant to be pursued by DNSPs and the one that best balances the costs and benefits of implementation.

Table 4.3: Pricing rules that would apply to the new export or bidirectional tariff option

Rule requirement	Insights | Variant 1	Insights | Variant 2
Regulated network tariff for providing regulated distribution network services to a retail customer should reflect the distribution network service provider's efficient costs of providing those services to the retail customer *Clause 6.18.5(a) Network pricing objective*	• Ultimately this rule will apply under all options because the DNSP's tariffs must support this objective (be they within a tariff class, a new tariff or an export charging parameter added to an existing tariff), but it will apply differently across these variants.	
	• Applies separately to both export tariffs and consumption-only tariffs	• Applies separately to both bidirectional tariffs and consumption-only tariffs
Each tariff must be based on the long run marginal cost (LRMC) of providing the service to which it relates to the retail customers assigned to that tariff *Clause 6.18.5(f) basing tariffs on LRMC*	• Would require both export LRMC and consumption only LRMC estimation and compliance demonstration. • There may be a case for export tariffs departing from LRMC (e.g. where rebates are desirable to incentivise customers to provide short-term network support).	• Would require both bidirectional DUoS LRMC and consumption only LRMC estimation and compliance demonstration
Expected revenue from each tariff must reflect the DNSP's total efficient costs of serving the retail customers that are assigned to that tariff *Clause 6.18.5(g)(1) consideration of fully allocated costs*	• Would require DNSPs to specifically demonstrate compliance of their dedicated export tariffs with this rule as well as their consumption only tariffs. It is likely to necessitate updating current fully-allocated cost modelling to separate the two services. • There may be a case for export tariffs departing from fully-allocated cost (e.g. where transition is required, or DNSPs want to incentivise uptake of particular export services).	• Would require DNSPs to specifically demonstrate compliance of their bidirectional tariffs with this rule as well as their consumption only tariffs. It is likely to necessitate updating current fully-allocated cost modelling to separate the two services. • There may be a case for bidirectional tariffs departing from fully-allocated cost (e.g. where transition is required, or DNSPs want to incentivise uptake of particular export services).

Rule requirement	Insights | Variant 1	Insights | Variant 2
	• We note that fully allocated cost may be unhelpful for pricing export services and may impede the DNSPs ability to focus on sending marginal export cost signals that are most likely to support realisation of allocative efficiency benefits. We discuss this further in section 4.2.5 and note that clause 6.18.5(g)(3) allows some flexibility in allocation of residual across network services and tariffs and must be applied in conjunction with this fully allocated cost rule.	
Networks can transition to compliant cost-reflective tariffs by managing the annual change in network tariffs to account for: a. a reasonable period of transition, which may extend over more than one regulatory period b. whether retail customers have a choice of network tariff c. the extent to which retail customers can mitigate the impact of any changes in tariffs through their usage decisions *Clause 6.18.5(h) customer impact principles*	• Requires separate transitioning of export services from consumption-only services which may make transition longer	• Transitioning a bidirectional DUoS service may be easier as there are more charging parameters and revenues to manage bill impacts through
	• Requires decision about whether current export customers can choose to remain on a consumption-only tariff or must choose an export or bidirectional tariff (i.e. will tariff reassignment be mandatory or will there by opt out provisions as a transitional measure). If it is not mandatory, then the benefits of the reform will not be maximised. • Paragraph (c) of this rule may require amendment to capture both usage and export decisions	
The structure of each network tariff must be reasonably capable of being understood by retail customers that are assigned to that tariff given the nature of those customers and the information provided to them and consultation undertaken by the DNSP *Clause 6.18.5(i) customer understanding principle*	• Applies separately to both export tariffs and consumption-only tariffs	• Applies separately to both bidirectional tariffs and consumption-only tariffs

Adding export charging parameters to existing tariffs

In this option, DNSPs would add one or more export charging parameters to their existing tariffs. This is equivalent to how some DNSPs' tariffs currently have a charging parameter for controlled loads like hot water systems (though the level of export capacity would not necessarily be controlled by the DNSP).

Under this option:

- DNSPs would not need to reassign customers from their current tariffs – this overcomes the potential problem of current export customers being left on legacy tariffs if DNSPs are not able to reassign them, but does not provide opportunity for customers to dispute a tariff reassignment
- DNSPs can implement a gradual transition through the level of the export charge(s) as the transition method if appropriate to mitigate customer impacts.

All the rules set out in Table 4.3 would still apply, but DNSPs would be able to rely on the current compliance demonstration in most cases, augmented to account for export costs and impacts where relevant:

- most pricing compliance demonstration with economic cost concepts (e.g. LRMC, standalone and avoidable cost, fully allocated cost) could simply be augmented to include export costs in the current modelling
- customer impact principles and the requirement for tariffs to be understandable would still apply.

Implications for scenarios

Given the complexity and potential additional regulatory burden of some pricing options, we consider that the scenario that best complies with the current rules and that is likely to best balance the costs and benefits of implementation will be that DNSPs:

- establish export pricing within existing tariff classes, and
- establish tariffs for bi-directional DUoS service either by introducing new bi-directional service tariffs or adding export pricing parameters to existing tariffs.

Either of these methods cause the current pricing principles for efficient tariff design, customer impact and customer understanding to apply when export prices are being proposed to the AER for approval.

4.2.4 Other pricing structure options

In addition to the above pricing options that affect the applicability and compliance burden of different pricing rules, there are further pricing design options (affecting both price structures and price levels) that may affect the outcomes of export pricing reform. These outcomes will include both the:

- complexity of implementing and administering pricing for DNSPs, retailers and retail customers, and
- extent to which allocative efficiency benefits are realised from the pricing reforms.

These options involve three key pricing design considerations. We explore each of these below, noting their outcomes and the implications for our scenario specification.

Consideration 1: Static versus dynamic pricing

The benefits and costs of DER exports to both customers and DNSPs are likely to vary over time:

- in the short-term (when some costs are fixed – such as capital investment), this variation may be at time of day, week and year/season based on the coincidence with the network's peak export levels or peak demand and is also likely to vary by network location

- in the long-term (when all costs are varied for incremental consumption and export), this variation may be less pronounced.

Key examples of DER export benefits and costs are:

- benefits of DER exports at times of network peak consumption demand where they can displace the need to deliver energy through the distribution network when it is facing maximum usage constraints
- costs of DER exports at times of low demand (e.g. the 10am-3pm solar sponge window recently introduced by SAPN) when there is insufficient customer consumption demand to absorb the DER exports, which can give rise to voltage spikes on low voltage lines and thermal overloading of substation transformers or fault currents caused by net reverse (upstream) flows.

Dynamic pricing can send signals to encourage DER export behaviours that either increase network benefits from exports or decrease or recover network costs from exports. The following pricing examples illustrate the spectrum of dynamic pricing examples from less dynamic to highly dynamic:

1. seasonal pricing
2. timing of use pricing
3. critical peak pricing or rebates
4. spot pricing in a market that settles prices (e.g. on a day ahead basis as happens in Australian gas markets, or 15 or 5 minute intervals as currently and will soon apply to wholesale electricity prices).

The greater the dynamism in export pricing, the more capable these are of supporting efficient export decisions of DER customers. However, there are costs in establishing, implementing and enabling customers to respond to such dynamic pricing, and the optimal level of dynamism will depend on the scale of DER exports and how price responsive they are.

Also, in some cases it may be easier to also seek to align customers' consumption with DER exports than to seek behavioural change in exports. SAPN's solar sponge consumption-based tariffs illustrates how this could be done.

The TSS process permits all forms of dynamic pricing other than spot pricing. This is because the AER must approve prices annually which cannot accommodate fully dynamic marked-based pricing.

Experience from consumption-based tariff reforms has shown that seasonal and time of use variants of dynamic pricing are now commonly used by DNSPs, whereas critical peak network pricing has only been deployed by one DNSP and, even then, it only applies to large customers (>160MWh/pa).

We have accounted for forms of dynamic export pricing in two of our proposed scenarios:

- The ***transition from entitlement scenario*** discussed above includes an option with a different export price when the capacity of DER exports responds to a dynamic operating envelope managed by the DNSP.
- A ***cost and reward scenario*** that includes both export charges at times where solar exports are likely to have net costs to the network and rewards for exports at times when they are likely to have net benefits to the network. Given experience in TSS processes to date, this scenario adopts a reasonably simple approach with a seasonal time of use export pricing structure where summer peak exports are rebated and exports during the 10am–3pm solar sponge window are charged an export price. This structure is used for illustrative purposes only. In practice, DNSPs may adopt a range of different price structures to reflect their local conditions. We understand that other analysis by the AEMC is considering the impacts of a range of different tariff structures for export charges and rewards.

Consideration 2: Locational versus network-wide pricing

The costs and benefits of DER exports can vary by location within a DNSP's network, with such variation likely to be more pronounced in the short-term and less so in the long-term (other than ensuring cost differentials between higher density CBD and urban networks versus lower density rural networks).

Variation in costs and benefits may be due to the various voltage levels of a DNSPs network, as reflected in how we presently see networks separately estimate their LRMCs by voltage level and some separate their tariff classes on this basis. Variations may also arise from different levels of DER uptake in different parts of the network and differences in the amount of exports various parts of the network can manage before reaching voltage or thermal limits.

Presently there are jurisdictional prohibitions on locational network pricing for small customers in SA and Tasmania, and also measures applied outside the TSS process in Queensland for equivalent effect.

Where locational pricing is currently applied by DNSPs, it only applies to large customers (e.g. SAPN's CBD versus non-CBD tariff differentiation in its current TSS). Our survey identified that no retailers currently offer tariffs designed to pass on locational network pricing signals to smaller customers.

We have therefore not included a scenario on locational network export pricing. Any large DER exporters that are scheduled generators will already face some form of locational signals through their dispatch and settlement outcomes.

Consideration 3: Upfront connection versus ongoing usage pricing

Historically, the primary lever through which network access and pricing arrangements have dealt with locational variation in costs and averaging (postage stamping) in network usage tariffs has been upfront connection charges. These apply to new connections or connection augmentations for larger customers and for smaller customers that require network extensions.

Connection charges perform individually assessed estimations of incremental costs and revenues at each connection point. They require a top-up connection contribution where incremental costs are less than incremental revenues (estimated using the averaged network tariff). This sends locational pricing signals to the connection applicant that:

- are not dependent on retailer pricing decisions
- ensure that existing DNSP customers are no worse off as a result of the connection (or augmentation).

For large DER export customers who are eligible for an individually calculated tariff under the DNSP's TSS, there is scope for the customer and DNSP to negotiate the relative balancing between up-front connection charges and on-going usage charges whilst still ensuring that a customer pays its efficient share of network costs.

As this flexibility exists today, generally only applies to large users, and would be made more efficient through the ability to include ongoing export charges, we have not considered this scenario further.

4.2.5 Cost allocation or attribution affecting price levels

The level of export tariffs will be affected by what costs DNSPs choose to, or are required or permitted by the rules to, allocate to export tariffs, bidirectional tariffs or export charging parameters.

Under the rules, the cost allocation and attribution requirements are path dependent upon how export pricing is implemented. Table 4.4 briefly recaps the preceding discussion of export pricing

implementation steps, implications for cost allocation or attribution, and our scenario specification assumptions.

Table 4.4: Export pricing implementation steps and implications for cost allocation or attribution

Step	Rules	Impact on cost allocation and attribution in our scenarios
Service classification	Part B and Part F	While we have flagged a range of options in section 4.2.2 above, all our proposed scenarios have relied upon the option of *augmenting the existing SCS DUoS service*. This avoids the requirement for DNSPs' AER-approved CAMs to separately regulate the allocation of costs to export services, and instead leaves cost allocation and attribution to the TSS process.
Establishing tariff classes	Clause 6.18.3	As discussed in section 4.2.3, having dedicated tariff classes for either an export only service or bidirectional services would require application of the economic cost concepts applied to tariff classes (namely standalone and avoidable cost). The tariffs within these classes would also require their own LRMC estimates and fully-allocated cost estimates (which include residual cost allocations). In contrast, using existing tariff classes enables augmentation of existing estimates of standalone and avoidable cost to account for any incremental export costs. Our scenarios rely upon this option.
Establishing new bidirectional tariffs	Clause 6.18.5	The tariffs would require their own LRMC estimates and fully-allocated cost estimates. LRMC could be driven by either peak consumption or peak export depending on which was driving the marginal investment costs.
Adding export charging parameters to existing tariffs		Export prices would not require their own LRMC estimates and fully-allocated cost estimates. However, the tariffs they are added to would still need to satisfy these rules, and thus current estimates may require augmentation for any incremental export costs.

Realising the allocative efficiency benefits of export pricing requires that export charging parameters signal the marginal cost (or benefit) of providing DER exports.

The rules require DNSPs' tariffs to collectively recover all their AER-allowed revenues, which includes recovery of their fixed and sunk costs. This gives rise to a need to also recover what is commonly called residual costs. Clause 6.18.5(g)(3) requires that this be done 'in a way that minimises distortions to the price signals for efficient usage'.

Presently all residual costs are recovered from fixed network access charges and consumption-based charges.

Residual cost allocations to export prices will affect:

- customer impacts in terms of the tariff levels they must pay
- the need for and pace of transition in tariff levels (or tariff assignment), and
- the efficiency of price signals in terms of incentivising DER export behavioural response.

We have therefore included scenarios with and without residual cost allocations to export prices, by adding an ***incremental pricing scenario***.

In addition to this scenario, we have set out below some of the potential benefits and downsides of allocating residual costs to export prices.

4.2.6 Pricing transition options

The impact on export customers of introducing export pricing, will be heavily influenced by decisions on the above issues. The outcome of these decisions will affect the extent to which additional transitional measures are required, and any transitional options will need to consider issues of:

- *Availability of customer choice* | This can include:
  - whether retailers offer prices with and without export price pass through
  - whether there is any optionality for customers in their network tariff assignment (e.g. opt in for an increased export capacity, or opt out of reassignment to a new bidirectional tariff)
- *Availability of rewards* | This can include:
  - whether DNSPs will be able to decide whether to introduce export charges only, or both export charges and export rewards
  - whether the rules should require DNSPs to also introduce export rewards if they introduce export charges
- *Which customers get charged* | This can include:
  - whether only new and augmented connections are charged export tariffs or if legacy customers are also charged
  - whether any size thresholds should apply (e.g. will export charges apply to all customers connected to a distribution network or only certain smaller customers based on a size threshold)
- *Customers' ability to respond* | Whether and how customers could respond, which may depend on:
  - the visibility of price signals to support timely behavioural response
  - the availability of DER integration technologies that enable automated response.

Any transitional measures that delay assignment to network tariffs with export prices, or deflate export prices below their efficient marginal export cost (or benefit) will reduce the timeliness and extent to which the allocative efficiency benefits for this limb of the reform are achieved.

As the availability of retailer offers with and without network export charges reflected in them will have a high impact on customers and on benefits realisation, we have included a ***retailer choice scenario***.

Recognising the path dependency of the need for transitional measures, we have structured our scenarios in order from the highest potential for negative customer impacts through to the lowest. This allows us to consider the potential need for additional transitional measures and their impacts for each scenario.

4.2.7 Jurisdictional preferences

The existing rules and TSS process have been designed to accommodate the preferences of governments that are codified in jurisdictional instruments and therefore binding on DNSPs. It is foreseeable that such preferences could cover a broad array of factors affecting export pricing, including service scope, service performance levels, pricing structure or levels, transition constraints, customer thresholds or segmentation, and even DER market design.

For example, in its submission to the AEMC's consultation paper, the Victorian Government has already stated that it does not currently support export charging. This is notwithstanding the fact that Victoria is

the only Australian jurisdiction with universal coverage of the smart meters needed to enable export charging and rebates.

Another example is the Northern Territory in which Power and Water Corporation operates both the bulk power system transmission assets and the distribution system, but is treated as a DNSP for the purposes of NER chapter 6. This means all generators of any scale in that market could potentially be subject to export pricing.

Recognising that jurisdictional governments may not support export pricing for their constituents, we have included a ***jurisdictional prohibition scenario*** to show how this can be accommodated in the TSS process and the implications for benefits realisation from the reform.

4.3 SCENARIOS

As the preceding discussion outlines, the scenarios have been designed to test threshold export pricing design and application variables that can affect the potential for negative impacts on customers, benefits realisation, the application of particular pricing rules and customer protections, and variations in the nature of the export service being provided and the benefits being realised from the reform. We recognise that these scenarios are not exhaustive. We have also set out in section 4.4 further considerations that affect multiple scenarios.

We have structured our scenarios in order from the highest potential for negative customer impacts through to the lowest and sought to recognise the path dependency of the need for transitional measures.

Our proposed scenarios are:

1. Jurisdictional prohibition scenario
2. Highest impact scenario
3. Retailer choice scenario
4. Incremental pricing scenario
5. Transition from export entitlement scenario
6. Cost and reward scenario.

There are several common elements across all these scenarios, which are that:

- the AEMC varies the distribution service definition so that DNSPs are required to provide export services and their allowed revenues recover the costs of providing and using export services
- export services are implemented by augmenting the existing SCS DUoS service rather than establishing separately classified export services
- DNSPs establish export pricing within existing tariff classes and establish tariffs for bi-directional DUoS services either by introducing new bi-directional service tariffs or adding new export pricing charging parameters to existing tariffs.

Below we describe the scope of each scenario. Section 4.4 then discusses customer considerations affecting all scenarios and our approach to these.

Jurisdictional prohibition scenario

DNSPs in one or more states or territories are prohibited from establishing tariffs based on exported energy, but are still required to provide export services and are permitted to recover the costs of providing and using export services through existing network access and consumption-based tariffs.

Highest impact scenario

Each DNSP introduces one mandatory export tariff with no optionality for customers in network tariffs and immediate reassignment of existing exporters to this tariff. Tariff levels reflect both incremental export costs and a reallocation of residual costs. Tariffs involve export charges but not payments (i.e. no rebates for export at beneficial times or locations) and are set full tariff levels on day 1 without a pricing transition. All retailers pass on the network export tariffs in full in their retail offers.

This scenario may benefit some customers (primarily customers without generation), but is intentionally designed to have the highest risk of negative impacts for some customers with generation.

Retailer choice scenario

The same specification as the highest impact scenario, however, some retailers either do not pass on the network tariffs or do not do so to the full extent, thereby enabling customers to opt out of network export charges through their choice of competitive retail[37] offer.

We note that in practice this scenario is effectively an overlay to all DNSP export pricing scenarios (i.e. scenarios 2 to 6). The consequences are that price impacts for exporting energy will be based on customers' choices of retail offers, which may include no impact, and that the extent of benefits realisation from the export pricing reform will be determined by that choice.

Incremental pricing scenario

This scenario builds upon the preceding scenarios by only attributing incremental costs to export charging parameters. This avoids reallocating currently shared costs to export prices. It supports lower export prices and means that exporting customers only pay export charges that reflect the expected future costs of providing export capacity to serve them.

This approach also reduces implementation costs by overcoming the need for DNSPs to revise their existing access and consumption-based tariffs and compliance models.

Transition from export entitlement scenario

This scenario introduces optionality for customers regarding the type of export service they want and how much they are willing to pay for different levels of service. It captures how the nature of the export service could be implemented in the bidirectional tariff structure by having differential prices for charging parameters that link to different forms and scales of export.

For this scenario we assume that the tariff structure has existing access and consumption-based charging parameters and three new export charging parameters are added:

- *Static limit exports block 1* | Low or no charge for exports up to a specified amount based on either the average existing static limit applied by that DNSP for customers of that type or the existing intrinsic capacity currently provided to customers of that type or location
- *Static limit exports block 2* | A (higher) charge for firm exports purchased between block 1 and a specified firm export cap
- *Dynamic control customer initiated exports* | An incentive-based charge for exports above block 1 set at a price lower than block 2 for variable export capacity provided through a dynamic operating envelope.

[37] In those jurisdictions where full retail contestability is not available for certain customers, there are other jurisdictional pricing protections in place (e.g. in the NT and northern Queensland).

Cost and reward scenario

This scenario builds upon the prior one by adding an export charging parameter that rewards exports that are likely to reduce network costs. An *export rewards* charging parameter would be set to provide an incentive rebate (negative tariff) paid to customers in certain circumstances.

This could apply to exports that occur when called upon by the DNSP, e.g. through notification of an upcoming rebate period (like a critical peak rebate tariff) or some form of dynamic control (like some existing demand response services). Alternatively, it could be a simpler structure where exports in a predefined time window are rewarded on the basis that exports during that period are likely to alleviate network congestion.

4.3.1 Summary of scenarios and relevant TSS tools, pricing principles and other considerations for each scenario

Table 4.5: TSS tools, pricing principles and other considerations that will be tested in each scenario

Key ⊘ relevant to this scenario ● particularly important for this scenario ⊗ not relevant to this scenario

Scenarios 1: jurisdictional prohibition; 2: highest impact; 3: retailer choice; 4: transition from export entitlement; 5: incremental pricing; 6: cost and reward

	Tool/principle/ consideration	Scenarios that will test the tool/principle/consideration						Reasons for not testing it further in any of the scenarios
		1	2	3	4	5	6	
TSS process requirements	DNSPs must consult consumers and retailers when developing tariffs	⊘	⊘	⊘	⊘	⊘	⊘	
	AER must consult on proposed TSS	⊘	⊘	⊘	⊘	⊘	⊘	
Network pricing principles	Network pricing objective, efficient pricing bounds, LRMC, consideration of fully allocated costs, and staying within total allowed revenues	⊘	⊘	⊘	⊘	⊘	⊘	
	Recovery of residual costs	⊗	●	⊘	⊘	●	⊘	
	Customer understanding principle	⊗	⊘	⊘	●	⊘	●	
	Customer impact principles - impact of price changes	⊗	●	⊘	⊘	⊘	⊘	
	Customer impact principles - choice of network tariff	⊗	⊘	⊘	●	⊘	⊘	

	Tool/principle/ consideration	Scenarios that will test the tool/principle/consideration						Reasons for not testing it further in any of the scenarios
		1	2	3	4	5	6	
	Customer impact principles - ability to mitigate impacts through usage decisions	⊗	✓	✓	●	✓	●	
	Compliance with jurisdictional obligations	●	✓	✓	✓	✓	✓	
Other network pricing considerations	Classification of export service as a new SCS, ACS or unregulated service	⊗	⊗	⊗	⊗	⊗	⊗	Unlikely to be adopted by DNSPs or approved by AER. Costs likely to exceed benefits
	Classification of exports as a new tariff class	⊗	⊗	⊗	⊗	⊗	⊗	As above
	Negotiated service for large users or separate tariff / tariff class for large users	⊗	⊗	✓	✓	✓	✓	Possible under scenarios 3-6 but not examined in detail as our focus is on potential harms for small users
	Impact on consumers will depend on extent of pass-through by retailers	⊗	●	●	●	✓	●	
	Dynamic forms of pricing	⊗	⊗	⊗	●	⊗	●	
	Locational pricing	⊗	⊗	⊗	⊗	⊗	⊗	Unlikely to be adopted by DNSPs for small users

4.4 CUSTOMER CONSIDERATIONS FOR ALL SCENARIOS

4.4.1 Customer types

As noted earlier, the distribution network pricing rules need to provide for efficient pricing in the many different circumstances that exist across a DNSP's network and customer base. Distinct customer tariff classes are used to group like customers and treat them fairly and efficiently.

For the purposes of assessing customer outcomes and rule safeguards, the AEMC has asked us to focus on small customers, i.e. those consuming less than the relevant jurisdictional threshold per year.

4.4.2 Pace of transition

The TSS process enables various ways that DNSPs, their customers and the AER can transition from the current model of no export prices to an end-state of all export customers facing cost reflective export pricing. At a high level the options include the items below.

For illustrative purposes, our scenarios all assume the fastest form of transition (i.e. mandatory assignment to an export tariff).

Transition through tariff assignment

The network tariff variants for a transition through network tariff assignment are that export customers:

1. can opt into a tariff that has export charging parameters
2. can opt out of a tariff that has export charging parameters, or
3. cannot opt out of a tariff that has export charging parameters.

The TSS lessons so far show that this decision is largely academic when retailers are not passing through these signals anyway (see section 3.3). In TSS round 2 we have also seen that the AER now prefers mandatory assignment with provision for opt out to another cost reflective tariff. The ACCC has also stated that:

> *retailers are best placed to manage the price risk of more dynamic network charges. It is critical that tariffs are designed in a way that sends clear signals to retailers, and that retailers cannot choose to avoid these signals.*[38]

Where relevant, our scenarios therefore assume that export customers will be assigned to a tariff that has export charging parameters and cannot opt out of this at a network level, but can do so at a retail level.

Transition through tariff levels

DNSPs can also affect a transition to cost reflective tariff levels by gradually increasing their export charges over time. We have selected scenarios that illustrate threshold customer impact considerations.

Our scenarios assume no transition in tariff levels to illustrate the most extreme customer impact versions of these scenarios, but we note that if DNSPs proposed some of these more extreme options then as part of the TSS process the AER might reject those proposals or require a transition in tariff levels.

We observe that this form of transition is available under most scenarios. Whether this is needed will depend on the level of customer impact expected from the desired end-state price levels compared to the status quo. Complementary quantitative analysis by the AEMC is examining the customer impact of different tariff levels.

4.4.3 Tariff rebalancing

DNSPs may face two types of changes in allowed revenues that can affect how tariff levels are set through a TSS process:

1. *Changed total revenues* | Firstly, if the AER-allowed revenue requirement increases to accommodate the costs of providing export services under an augmented distribution service definition, and
2. *Changed revenue shares* | Secondly, if a DNSP elects to rebalance the share of its allowed revenues it recovers from different tariff classes, tariffs or charging parameters as a result of now being permitted to price its export services.

[38] ACCC, Restoring electricity affordability and Australia's competitive advantage, Retail Electricity Pricing Inquiry Final Report, June 2018, p. 181.

In the first case, one option would be for all of the additional costs to be recovered from new export charging parameters without needing to make any changes to existing consumption-based charging parameters. This option, of course, would require those additional costs to be identifiable.

In the second case, DNSPs would need to undertake tariff rebalancing. A DNSP would need to reduce tariff levels for some customers or charging parameters to able to introduce charging parameters for export services. This is necessary to ensure that total revenues for a DNSP after adding export pricing do not exceed its allowed revenues.

There are many choices available to DNSPs for rebalancing, and rebalancing would necessarily be the subject of customer and stakeholder engagement. It may therefore be reasonable to assume that where rebalancing requires price reductions, that these would be achieved through reductions for customers in the same tariff class who do not export (or charging parameters in that tariff or tariff class that are not relating to exports). For example, if a residential export charging parameter were added, any required rebalancing could be achieved through reductions in other residential charging parameters. We have adopted this high-level assumption for the purpose of our scenario analysis.

4.4.4 Export capacity allocation

An issue that can currently arise in DNSPs' provision of export services is how available export capacity is allocated among existing and prospective customers who are seeking to export distributed energy.

If approved, the '*updating the framework*' limb of the rule change will improve this, by explicitly allowing DNSPs to invest in provision of export capacity. However, there will be economically efficient limits to the amount of export capacity that should be provided to meet all customers' long-term interests.

There may remain a need for DNSPs to allocate available capacity between their current and prospective exporting customers. The '*allowing price signals*' limb of the rule changes can aid this under several scenarios, but there will likely continue to be a role for the network connection and charging process in such allocations.

We observe that the transition from entitlement scenario is an example of how export pricing signals can support capacity allocation based on a combination of legacy allocations and customer choice (or willingness to pay) for different firmness of additional export capacity.

5. Looking forward | Scenario outcomes, risks and benefits

This section examines the outcomes of our export pricing scenarios if we rely on the current rules framework. It uses the TSS process and scenarios to assess the extent to which the current TSS process provides adequate 'safeguards' for export pricing. This helps us identify:

- how the current TSS process would apply in that scenario
- whether clarifications of the rules or their intended application may assist implementation
- what impacts different approaches may have on realisation of the benefits of the reforms and the potential impacts of the reforms on customers
- what transitional arrangements may be most effective in mitigating any potential negative impacts on customers, and
- whether the approach under each scenario is likely to provide benefits that exceed the costs.

We note upfront that any pricing reform will involve changes that affect customers differently and which the rules are permitting based on the expected long-term benefits across all customers. This means that our analysis examines both the potential extent of benefits realisation and potential consumer harms for each scenario.

For each scenario we answer the following questions:

1. What will be the extent of reform benefits realisation (having regard to the available benefits described in section 4.1)?
2. What will be the impact on customers who export and on customers who do not export?
3. How would the scenario work through the TSS process?
4. Would the rules require amendment for this scenario?

5.1 SCENARIO 1 | JURISDICTIONAL PROHIBITION

Description | In this scenario DNSPs are prohibited by jurisdictional governments from establishing tariffs based on exported energy, but are still required to provide export services and permitted to recover the costs of providing and using export services through existing network access and consumption-based tariffs.

Insights | This scenario can be accommodated within the current rules, but only the supply-side benefits of DER export integration could be achieved, and all customers would continue to pay for export services irrespective of their ability and willingness to export.

Extent of reform benefits realisation

- Productive efficiency benefits *largely achieved*, except DNSPs are unable to use tariff signals to procure grid support from exporters at desirable times and locations. This could still be achieved through separate payments for network support services.
- Allocative efficiency gains *not achieved* in how export customers use the grid.
- Dynamic efficiency gains from DER integration only *partially achieved* with DER integration only coming from the DNSP supply side – DER export customer behavioural integration not supported.

Impact on customers who export

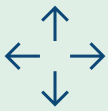
- No price impact beyond that seen by all customers.

Impact on customers who do not export

- All customers collectively incur costs of enabling exports.

Approach to the TSS process

- The TSS process would apply as under the status quo.
- Economic cost models would require updating to include export costs.



Rule amendment

- *No change required*. Clause 6.18.5(j) already requires that 'A tariff must comply with the Rules and all applicable regulatory instruments'. Provided the jurisdiction prohibition is implemented through a jurisdictional regulatory instrument and is done in a timely way relative to the commencement of TSS engagement (i.e. 3 years prior to the TSS period), the TSS process should function as intended.

5.2 SCENARIO 2 | HIGHEST IMPACT

Description | In this scenario each DNSP introduces one mandatory export tariff with no optionality for customers in network tariffs and immediate reassignment of existing exporters to this tariff. Tariff levels reflect both incremental export costs and a reallocation of residual costs. Tariffs involve export charges but not payments (i.e. no rebates for export at beneficial times or locations) and are set full tariff levels on day 1 without a pricing transition. All retailers pass on the network export tariffs in full in their retail offers.

This scenario may benefit some customers (primarily customers without generation, who will receive a reduction in their network charges), but is intentionally designed to have the highest risk of negative impacts for some customers with generation.

Insights | This scenario has the greatest bill impact on export customers with the greatest savings for non-export customers. All reform benefits are largely achieved, though there is scope for further enhancement.

This scenario may be possible within the current rules, but there is a high risk that it would infringe the current pricing principles and would not be approved by the AER. Significant additional consumer engagement, compliance demonstration and assessment would be required by DNSPs and the AER respectively.

As a result, we expect that this scenario is unlikely to be proposed by DNSPs without some form of transitional arrangements to make it more likely to comply with the customer impact principles.

Extent of reform benefits realisation

- Productive efficiency benefits *largely achieved*, except DNSPs do not use tariff signals to procure grid support from exporters at desirable times and locations. This could still be achieved through separate payments for network support services.
- Allocative efficiency gains *largely achieved* in how export customers use the grid, however both 1) reallocation of residual costs and 2) no choice in type of network export service, may lead price-responsive exporters to export less than is efficient depending on the relative impact it has after accounting for the scale of feed in tariff benefits.

- Dynamic efficiency gains from DER integration *largely achieved* with DER integration from the DNSP supply side, and some DER export customer behavioural integration through response to price signals.

Impact on customers who export

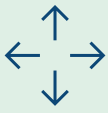
- Price impact for exporting any energy.
- Prices higher than marginal cost of providing export services, and no choice in type of export services, so some efficient exports may be discouraged.
- Full retailer-pass through makes it important that prices are capable of being understood by export customers.

Impact on customers who do not export

- Bill reduction equal to the reallocated residual costs.

Approach to the TSS process

- Is a high risk that this scenario would not comply with the current pricing principles and would not be capable of being approved by the AER. DNSPs would need to show:
  - how the level of tariffs and the absence of export payments complies with the various economic cost principles
  - how the scenario meets the customer impact principle in relation to the impact of annual price changes, as it appears unlikely to meet that principle without some form of optionality or transitional arrangements, e.g. to gradually increase export prices over one or more regulatory periods
  - how consumers had been consulted and their feedback taken into account, with this scenario unlikely to be approved if customers raised significant concerns about customer impacts during the consultation process and DNSPs did not modify their proposals to address those concerns.
- Tariff reassignment process triggered, but less administrative burden for DNSPs because opt out not available.
- Side constraint status quo application.
- Requires changes to both bidirectional tariffs and consumption-only tariffs to demonstrate rule compliance, doubling compliance effort on a range of rules. Network pricing objective, customer impact and understanding principles, LRMC and fully allocated cost rules apply separately to both bidirectional tariffs and consumption-only tariffs.
- Update current cost estimates for new service definition (affects the compliance with efficient pricing bounds, LRMC and fully-allocated cost).



Rule amendment

- *No change required*.

5.3 SCENARIO 3 | RETAILER CHOICE

Description | In this scenario the same network tariff specification as the highest impact scenario 2 applies however some retailers either do not pass on the network tariffs or do not do so to the full extent. This allows customers to opt out of network export charges through their choice of competitive retail offer.

Insights | This scenario is capable of the same benefits realisation and customer impacts as scenario 2, however the extent of these will be determined by the decisions of retailers and their customers.

The rule compliance issues are the same as under scenario 2, with a high risk that the proposed tariffs will not comply with the current rules and will not be approved by the AER (noting that the AER is unlikely to know for certain at the time of approval of the first TSS containing export prices whether those prices will be passed on by retailers).

Extent of reform benefits realisation

- Productive efficiency benefits *largely achieved* as per scenario 2.
- Allocative efficiency gains and dynamic efficiency gains are *capable of being achieved* in line with scenario 2, with the extent being determined through customer and retailer choices.

Impact on customers who export

- Price impact for exporting any energy based on customer's choice of retail offer, which may include no impact.
- No choice in type of network export service.

Impact on customers who do not export

- Same as scenario 2.

Approach to the TSS process

- As in scenario 2. May not comply with economic cost and customer impact principles and high risk that it may not be approved by the AER.

Rule amendment

- *No change required*.

5.4 SCENARIO 4 | INCREMENTAL PRICING

Description | This scenario builds upon scenario 3 by only attributing incremental costs to export charging parameters. This avoids reallocating currently shared costs to export prices. It supports lower export prices and means that exporting customers only pay export charges that reflect the expected future costs of providing export capacity to serve them.

This approach also reduces implementation costs by overcoming the need for DNSPs to revise their existing access and consumption-based tariffs and compliance models.

Insights | This scenario is possible under the current rules (particularly if supported in customer engagement) and could enhance allocative efficiency relative to scenarios 2 and 3. It could be an effective way of managing potential consumer harm and complying with the consumer impact principles. It could have much less compliance burden because it could avoid needing to rebalancing existing consumption-based tariffs.

A potential downside of this approach is that it could impede DNSPs' ability to efficiently recover their residual costs from export tariffs where doing so would best comply with the pricing principle requirement in clause 6.18.5(g)(3) to minimise distortions to the price signals for efficient usage. For example, if export services are seen as a less essential service than electricity consumption services and exporters can still make a net profit from exports after accounting for retail feed in tariffs, then they may have a less price responsive demand for network use than do some electricity consumers (e.g. lower

income or vulnerable customers). In these circumstances it may be efficient and consistent with the NEO to allocate residual costs to export services.

Extent of reform benefits realisation

- Productive efficiency benefits *largely achieved* as per scenario 2.
- Allocative efficiency gains are enhanced relative to scenario 2 and 3 because export network signal only reflects incremental costs, but remain rated as *capable of being achieved* in line with scenario 3, with the extent still being determined through customer and retailer choices.
- Dynamic efficiency gains remain rated as *capable of being achieved* in line with scenario 3.

Impact on customers who export

- Exporting customers' retailers will face lower export price in network tariff.
- Price impact for exporting any energy based on customer's choice of retail offer, which may include no impact.
- Still no choice in type of network export service.

Impact on customers who do not export

- The bill reduction will be lower than under scenarios 2 and 3. There is likely to be no bill reduction for non-exporting customers in the short term, but long-term bills will be lower than under scenario 1 as all new export-related costs would be paid for by exporting customers.

Approach to the TSS process

- Is likely to be capable of complying with the current pricing principles. DNSPs would need to show:
  - how the approach of not reallocating any shared costs to export services complies with the economic cost and customer impact principles in the rules, but it appears to be a valid option for managing the impact of price changes on customers
  - as in scenarios 2 and 3, how the absence of export payments complies with the various economic cost principles, which may not be accepted by the AER.

  Customer consultation by DNSPs and the AER would need to consider the balancing of lower export prices for exporting customers and smaller bill reductions for non-exporting customers compared with other approaches like scenarios 2 and 3.
- Significantly less duplicated effort than in scenario 2 because existing compliance demonstration for consumption-based tariffs is unaffected.
- There may be some scope for stakeholder confusion about what constitutes incremental costs for pricing purposes. Stakeholders may expect incremental costs to only look at the export costs included in the DNSP's 5 year allowed revenue forecasts for that TSS period, whereas the incremental cost concept used in the rules is assessed over a long-run timeframe (i.e. LRMC) which AER guidance says is a minimum of 10 years, and some DNSPs have interpreted as up to 40 years in prior TSSs.

Rule amendment

- *No change required*.
- Rule clarifications could make this scenario easier or mandate this approach. For example, 'tariff' is not defined in the rules, if this lead to an interpretation that the fully allocated cost rule (clause 6.18.5(g)(2)) had to apply to export charging parameters it may impede this scenario. If the AEMC wanted to mandate an implementation approach that cannot disrupt the level of existing approved consumption based tariffs, it could add a rule requiring export charging parameters to be incrementally priced. Such a rule may or may not specify the time horizon for incremental cost assessment.

5.5 SCENARIO 5 | TRANSITION FROM EXPORT ENTITLEMENT

Description | This scenario introduces optionality for customers regarding the type of export service they want and how much they are willing to pay for different levels of service. It captures how the nature of the export service could be implemented in the bidirectional tariff structure by having differential prices for charging parameters that link to different forms and scales of export.

For this scenario we assume the tariff structure has existing access and consumption-based charging parameters and three new export charging parameters are added:

- *Static limit exports block 1* | Low or no charge for exports up to a specified amount based on either the average existing static limit applied by that DNSP for customers of that type or the existing intrinsic capacity currently provided to customers of that type or location
- *Static limit exports block 2* | A (higher) charge for permitted exports purchased between block 1 and a specified export cap
- *Dynamic control customer initiated exports* | An incentive-based charge for exports above block 1 set at a price lower than block 2 for variable export capacity provided through a dynamic operating envelope.

Insights | This scenario is possible within the current rules. It introduces export service choice in a manner that can minimise customer impacts of immediate export pricing implementation. It further enhances allocative and dynamic efficiency relative to prior scenarios. It likely requires more consultation to explain a greater range of export service options and corresponding tariffs. It also introduces questions about how the level of export service capacity provision and performance is monitored, and the need for customers to understand that any optional services will not confer a 'firm' or 'guaranteed' right to always export that amount of energy.

Extent of reform benefits realisation

- Productive efficiency benefits *largely achieved* as per scenario 2.
- Allocative efficiency gains are enhanced relative to scenario 4 because customers can choose the type of export service.
- Dynamic efficiency gains are enhanced relative to scenario 4 because the customers' choice of export service can enable a greater diversity in the ways DER customers integrate their behaviours with the grid.

Impact on customers who export

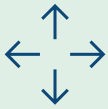
- Retailer will face choice of export service type and prices in network tariff.
- Price impact for exporting any energy based on customer's choice of retail offer, which may include no impact or can include different export service types and prices based on a default export threshold then the firmness of any exports beyond that.
- Establishing a default export threshold at legacy levels and potentially not pricing this, would allow for export pricing to only impact customers that choose a higher level of export service than they have today.

Impact on customers who do not export

- Similar to scenario 4.

Approach to the TSS process

- Is likely to be capable of complying with the current pricing principles. The customer impact principles provides that 'whether retail customers have a choice of network tariffs' is one of the matters to take into account when considering the impacts of price changes on customers. As in scenarios 2 to 4, DNSPs would need to demonstrate how absence of export payments complies with the various economic cost principles, which may not be accepted by the AER.
- As in scenario 4, however DNSPs now need to consult on and demonstrate compliance for multiple export charging parameters. Only a subset of rules require compliance demonstration for charging parameters, and none do so in isolation of considering the tariff as a whole.



Rule amendment

- *No change required*.

5.6 SCENARIO 6 | COST AND REWARD

Description | This scenario builds upon scenario 5 by adding an export charging parameter that rewards exports that are likely to reduce network costs. [39] An *export rewards* charging parameter would be set to provide an incentive rebate (negative tariff) paid to customers in certain circumstances.

This could apply to exports that occur when called upon by the DNSP, e.g. through notification of an upcoming rebate period (like a critical peak rebate tariff) or some form of dynamic control (like some existing demand response services). Alternatively, it could be a simpler structure where exports in a predefined time window are rewarded on the basis that exports during that period are likely to alleviate network congestion.

Insights | This scenario is possible under the current rules, maximises the extent of benefits realisation for all forms of efficiency and has the more favourable customer impacts for exporters[40] and non-exports of any of the export pricing scenarios.

Extent of reform benefits realisation

- Productive efficiency benefits are *achieved* as DNSPs can now use export pricing to procure exports to lower their network costs.
- Allocative efficiency gains are *achieved* and are enhanced relative to scenario 5 because how exporters use the grid is now a function of both value to the customer and value to the grid.
- Dynamic efficiency gains are *achieved* and enhanced relative to scenario 5 the ways DER customers integrate their behaviours with the grid are now a function of both value to the customer and value to the grid.

[39] While we have made this scenario incremental to scenario 5, it could also be applied as a variant to scenarios 2, 3 and 4.

[40] Whether this scenario is favourable for exporters over scenario 1 (jurisdictional prohibition), will depend on whether smearing incremental export costs across all customers and not having the network savings of DNSPs using export services to lower their costs, has a lower price impact for exporters than paying incremental export costs for their choice of export service, being able to be rewarded for those exports that help DNSPs lower their costs and benefiting from lower network costs overall.

Impact on customers who export

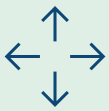
- As in scenario 5 with the additional benefit of being able to be paid for certain exports.

Impact on customers who do not export

- Has the potential to result in the largest bill reductions for non-exporting customers out of the scenarios as further savings from DNSP-rewarded exports result in lower network costs for all customers.

Approach to the TSS process

- As in scenario 5, however DNSPs now need to consult on and demonstrate compliance for export reward charging parameters.



Rule amendment

- *No change required*.
- Rule clarification could aid the smooth implementation of the reform. For example, the NER may not prohibit charging parameters being rebate amounts, but this could be made explicit for the avoidance of any doubt. Clarity could be provided on whether rebates need to comply with the cost reflectivity principles or can simply be incentive based.

6. Findings and potential additional measures

Drawing on the TSS insights in section 0 and scenario analysis in sections 0 and 5 this section summarises our conclusions about the TSS process for export pricing, and identifies potential measures that could reduce harms or improve efficacy of the reform.

6.1 CONCLUSIONS

In summary, our TSS lessons and scenario analysis support the conclusion that the existing TSS process and pricing principles are robust to introducing export pricing. We found no reason to expect that material consumer harms would remain after the application of the existing safeguards.

In particular:

- the existing TSS process and pricing principles provide for a range of different transitional tools and other mechanisms that can be used by DNSPs and the AER (in consultation with customers) to mitigate the impact of introducing export pricing on customers
- the existing TSS process and pricing principles are likely to steer DNSPs towards scenarios that include measures to mitigate potential harm for exporting consumers during transition – e.g. through some combination of how residual costs are allocated, providing a choice of network export tariffs and/or including export rewards as in scenarios 4 to 6, as those scenarios are more likely to comply with the current rules and be approved by the AER
- while scenarios that have higher potential for customer harm, most notably scenarios 2 and 3, are not explicitly prohibited by the rules, the current TSS requirements mean that there is a high likelihood that

these scenarios would not be proposed by DNSPs or approved by the AER, especially if consumers raise significant concerns with them during the consultation that is required as part of the TSS process

- all of the scenarios involve a trade-off between the size of potential increases in network charges for exporting customers and the size of potential reductions in network charges for non-exporting customers, noting that:
  - it is likely to be preferable to use the existing TSS process to balance these considerations and determine the most appropriate scenario following consultation by DNSPs and the AER with customers for each DNSP, and
  - where the balance between these considerations lies may vary across networks depending on local conditions such as the extent of DER uptake and the level of export constraints.

6.1.1 Options if some potential scenario impacts are to be ruled out

If the AEMC considered that the potential for customer impacts was too high under some scenarios, then the AEMC could:

- amend the rules to require all DNSPs to adopt a specified approach to the transition to export pricing, or to include certain prescribed features in their proposed approach to transition, or
- amend the rules to require the AER to develop and consult on an export pricing guideline.

Potential transitional requirements

Table 6.1 sets out potential transitional requirements that the AEMC could consider for *how* transition is done by DNSPs, ordered broadly from the least to the most interventionist. Section 6.2.3 discusses options for *when* it is done by DNSPs. We also note upfront the key lesson of prior reforms about the need to recognise the role in reform pace and customer outcomes that is played by retail tariffs and customer choice of retail offer. Decisions on the measures below must account for this role, and section 6.2.4 therefore also notes potential complementary retail measures.

It would be possible to implement each of these DNSP requirements through amendments to the rules. Some of them would likely be implemented through transitional rules that modify the pricing principles for the first one or two TSS periods after implementation, while others would likely involve permanent rules that modify the application of the pricing principles to export pricing. The various options would involve differing levels of complexity to both draft a suitable amendment to the rules and for DNSPs to implement that requirement. The table below does not provide detailed comments on rules drafting or implementation matters. If the AEMC decided to adopt one of these options, or another option, we could advise separately on rule implementation issues.

Each of these approaches would have potential advantages and disadvantages as summarised in the table. The main disadvantage with each of these approaches is that they would impose a 'one size fits all' approach to transition where every DNSP is required to adopt the same transitional measure regardless of its local circumstances and the views of its retailers and customers. It is likely to be more effective to allow the standard TSS process apply so that the transitional approach is determined by each DNSP and the AER after consultation with consumers and retailers.

These measures have been developed for the small customer safeguard focus that the AEMC has requested of us. Some of them may be problematic if applied to large users. There would also need to be careful consideration to rule design if they were to be implemented in rule changes for specific customer types only.

Table 6.1: Potential options for rule changes to mandate the approach to transition

Option	Advantages	Disadvantages
Require export rebates | Any DNSP that introduces export charges must also introduce export rebates.	• Rebates are consistent with the intent of the reforms. • Rebates provide opportunities for financial benefits for exporting customers. • Rebates could reduce any potential negative price impacts.	• It may not be appropriate if this is implemented for all DNSPs from day 1 of the reforms and may impose unnecessary implementation[41] and compliance costs[42] for some DNSPs. • May need a carve-out from cost reflective pricing principles where rebates are not economically justified (e.g. where these are set at rates to provide desired behaviour incentives that exceed avoided costs). • Does not recognise that networks also have non-tariff options to reward customers such as demand response payments to customers.
Phase in export prices over time | Any DNSP that introduces export charges must phase them in over a specified timeframe, e.g. by calculating an efficient level of export charges and gradually increasing charges from 0 to 100% of that level over 2 regulatory periods.	• Consistent with the existing consumer impacts principles. • Mitigates the potential price impact on exporting customers.	• Delays benefits realisation from the reforms. Reduces potential bill savings for non-exporting customers during the transitional period. • Mandates one approach to transition when other alternatives may be preferable. • Does not recognise the role of retail tariffs and customer choice of retail offer that has been a key lesson of prior reforms.

41 For example, establishing rebates for exports at times of network benefit may require establishment of dynamic controls for coordinating those exports, which could be uneconomic for some DNSPs or network locations.

42 Any new binding obligation would trigger additional compliance demonstration. As discussed in section 4.2.3, DNSPs would already be required to show how any voluntarily proposed rebates comply with the relevant pricing principles, including that they had been developed through consultation

Option	Advantages	Disadvantages
Require optionality | Any DNSP that introduces export charges must also offer a tariff option that does not include export charges, e.g. as in the transition from export entitlement scenario where there is no export charge for a basic service with a lower export limit.	• Provides customer choice. Mitigates the potential price impact on exporting customers.	• May not be appropriate for all DNSPs, e.g. depending on their current levels of DER uptake, export constraints and access to the data needed to effectively implement such optionality. • Does not recognise the role of retail tariffs and customer choice of retail offer that has been a key lesson of prior reforms.
Prohibit the reallocation of sunk costs to export charges | DNSPs could be prohibited from reallocating any existing costs from consumption charges to export charges. [43]	• Mitigates the potential price impact on exporting customers.	• Could reduce benefits realisation from the reforms, e.g. by reducing potential bill savings for non-exporting customers. • Mandates one approach to transition when other alternatives may be available and preferable in certain circumstances.
Prohibit the allocation of residual costs to export charges | DNSPs could be prohibited from allocating any residual costs to export charges, i.e. export charges must be set at LRMC with all residual costs allocated to consumption charges.[43]	• Mitigates the potential price impact on exporting customers.	• Could reduce benefits realisation from the reforms, e.g. by reducing potential bill savings for non-exporting customers. • Could create an impediment to efficient network tariff design when export pricing becomes a larger share of DNSP revenues. • To the extent that export services are considered not to be an 'essential service' in the same way that electricity consumption commonly is, this would prevent non-essential services making a contribution to DNSPs' average costs.

[43] These last two options have some equivalence to SA Power Network's proposal that export services should not be allowed to recover the costs of the 'intrinsic capacity' in the network to host exports, noting that intrinsic capacity is not a concept currently defined in the pricing principles or the economic cost concepts used in those principles.

Establishing an AER guideline on export pricing

A further option would be for the AER to develop a guideline on the approach to export pricing. This guideline could either be developed by the AER of its own accord or transitional rules could require the AER to develop and consult on such a guideline.

Potential benefits of this approach include that:

- a requirement for a guideline would be easier to draft and implement than the rule change options discussed in Table 6.1
- a guideline could retain some flexibility to applying the pricing rules for circumstances where DNSPs can demonstrate that departures from the guidance are preferable, or establish clear preconditions for certain export pricing and transition options (e.g. of the forms the AER has published in its policy positions on tariff assignment discussed in section 3.3.1)
- public consultation on the guideline may make it easier for consumers and their representatives to engage in the process for designing export pricing rather than having to engage separately with each DNSP when developing their TSSs
- because the existing rules have been used for a while only for consumption based tariffs, there may be need for some change management to encourage DNSPs and the AER to identify and settle on how these same rules will apply to export pricing and the compliance demonstration required for this
- the guideline development and consultation process could support fit-for-purpose transitional requirements for different customer types and network circumstances, and
- jurisdictional policy preferences could be considered in the guideline development and consultation process.

6.2 POTENTIAL PRICING RULE MEASURES

Notwithstanding the above conclusions, there are however some additional steps we have identified that the AEMC could undertake to promote its objectives. These include:

- *Consequential rule changes* | Some rules that require modification to explicitly reference exports in order to continue to apply as intended
- *Potential rule clarifications* | Some rule clarifications that the AEMC could consider to remove doubt about the function of some rules and thereby lessen regulatory burden in complying with and administering those rules for DNSPS and the AER respectively
- *Timing of introduction of export charging* | Some rule changes the AEMC could consider if it wanted to mandate certain approaches to the introduction of export pricing
- *Retail pricing* | Retail pricing measures that could complement the reform.

The following sections discuss these issues at a high-level. The NER rule change elements draw upon our detailed commentary on applicability to exports for each of the individual pricing rules in chapter 6 of the NER as set out in Appendix C.

6.2.1 Consequential rule changes

Some rules include language that may prevent their proper application if the distribution service definition is augmented to include export services and the prohibition on export pricing is removed. This primarily affects the rules for tariff assignment and those that reference 'usage' as a determining factor in a rule's application.

The term 'usage' is not defined in the rules. If it is read as 'consumption', as may logically be the case in a number of instances, it could be problematic for export pricing implementation. If it is read as 'usage of distribution services' or 'network use', then it may not be an issue.

Clause 6.18.4 covers the principles governing assignment or re-assignment of retail customers to tariff classes and assessment and review of the basis of charging. Because the nature of customers' exports could become a basis for assigning customers to tariff classes and treating like customers fairly as these rules currently intend, they would likely benefit from amendment.

Specifically:

- Clause 6.18.4(a)(1) and 6.18.4(a)(2) may require augmentation to also account for nature and extent of a customer's exports, unless the nature and extent of their usage or the nature of their connection is considered sufficient for this purpose.
- Clause 6.18.4(a)(3) states that 'retail customers with micro-generation facilities should be treated no less favourably than retail customers without such facilities but with a similar load profile'. This rule would likely require deletion or amendment.
- Clause 6.18.4(b) requires that: '*If the charging parameters for a particular tariff result in a basis of charge that varies according to the usage or load profile of the customer, a distribution determination must contain provisions for an effective system of assessment and review of the basis on which a customer is charged.*' This should also account for export charging parameters.

The customer impact principles in clause 6.18.5(h) permit DNSPs to depart from cost reflective network tariffs where year-on-year changes would excessively impact customers. This includes having regard to: '*the extent to which retail customers are able to mitigate the impact of changes in tariffs through their usage decisions*' in clause 6.18.5(h)(s). This should also account for customers' ability to mitigate bill impacts through changes in their exports.

6.2.2 Potential rule clarifications

The AEMC could consider several rule clarifications to remove doubt about the function of some rules and thereby lessen regulatory burden in complying with and administering those rules for DNSPs and the AER respectively. Some of these changes would also affect consumption charges so may be outside of the scope of the current rule change process. Such changes could potentially be considered in later rule changes.

Specifically:

- *Defining 'tariff'* | The term '*tariff*' does not have a definition in the rules. It is somewhat implied in the definition of charging parameter, but may benefit from its own definition. We note that this may require broader consideration of the role of the term 'tariff' in how certain pricing rules apply to standard control versus alternative control services.
- *Clarifying 'tariff class' definition* |There is currently some uncertainty regarding what constitutes a 'tariff class' as opposed to a 'tariff'. This distinction is important for the application of several provisions of the rules and has previously been the subject of a judicial review. There may be benefit in clarifying the definition of 'tariff class'.
- *Rebates or negative charging parameters* | The AEMC should confirm whether tariffs for a direct control service can include a payment by a DNSP to the customer (e.g. for either consuming or exporting at times that reduce network costs). If so, are there any limits on this, e.g. is a credit to reduce other charges under the tariff different to a situation where there could be net payment from the DNSP to the customer for a direct control service?

- *Clarifying the network pricing objective* | The AEMC could confirm that the references to 'charges' and 'costs' in this objective can accommodate tariffs that involve the DNSP paying the customer where exports reduce the DNSP's efficient costs.
- *Clarifying role of LRMC for export pricing* | As discussed in section 3.3.2 there may be sound reasons to not require export charging parameters to reflect LRMC of export service provision. As our scenario development in section 4.2.3 explains, this may or may not be a rule issue depending upon how DNSPs introduce export pricing. We note that the rules already provide a degree of discretion as to how LRMC is calculated and applied in tariff design (e.g. in clauses 6.18.5(f) and (h)), and so guardrails for the exercise of that discretion could be clarified in AER guidance rather than rule amendment.

Pricing to retail customers or their energy suppliers

A more consequential clarification relates to the question of for whom network tariffs should be designed. As we discuss in section 3.3.1 and 4.2.1 the network pricing rules currently require the pricing principles to apply to retail customers, and there may be a case for revisiting this aspect of the pricing rules to enable pricing designs that also target retailers and energy intermediaries.

This affects multiple rules including those for cost attribution. It also has particular affect for the permitted complexity of network tariff designs (e.g. as we enter an age of increasingly automated smart energy controls) which brings into question clause 6.18.5(j) which requires that: '*The structure of each tariff must be reasonably capable of being understood by retail customers that are assigned to that tariff*.'

6.2.3 Timing of introduction of export charging

The AEMC could consider if certain rule changes better support its reform intent by mandating certain approaches to the introduction of export pricing. We do not consider that any of these changes are necessary, but raise them as potential issues the AEMC may wish to consider depending on its policy objectives regarding the transition to export pricing.

Specifically:

- *Permitting export prices before the next TSS round* | As a transitional measure, the AEMC may want to either require or rule out reopening current TSSs via changes in clause 6.18.1B for amending a tariff structure statement with the AER's approval. This may also affect whether clause 6.18.2 requires a carve out for export pricing in annual pricing proposals that pre-date the next distribution determination.
- *Export pricing trials* | The rules currently permit network tariff trials for 'sub-threshold tariffs' in clause 6.18.1C, which can occur even if a TSS is not reopened to allow export pricing. There may be benefits in the AEMC clarifying whether equivalent small-scale trials (<0.5% of revenue per annum or <1% for balance of TSS period) of export tariffs will be permitted immediately, or if the requirement should be to wait until the next TSS period. Because trials also circumvent the need for compliance with the pricing principles and current TSS, they may not have sufficient customer protections. The AEMC may wish to consider amending the rules to provide that trials are only permitted if trial participation is voluntary or that they have been established through a process of consultation. This issue will not arise if the export pricing rules do not commence until the start of the next TSS period.
- *Pace of transition* | The AEMC may want to consider if the rules should incentivise a pace of transition capable of realising the export pricing benefits in a timely way given the experience for consumption-based network tariff reforms to date and the fact that the rate of DER export proliferation may give rise to greater legacy tariff and transitional issues if the current reforms are implemented over multiple regulatory periods (e.g. as explicitly permitted in clause 6.18.5(h)(1)).

6.2.4 Retail pricing issues

As our survey, TSS lessons and scenario analysis have identified, customer outcomes and the extent of reform benefits realisation will ultimately be determined by the decisions of retailers and energy intermediaries in response to network export pricing.

Provision for jurisdictions to require such retail tariff structures already exists in the National Energy Retail Law (NERL). Sections 22(1a) and 22(1b) of the NERL allow jurisdictions to require that for small customers with an interval meter:

- a retailer's standing offer must include certain tariff structures that are prescribed in a jurisdictional instrument, and
- retailers may be required to allow small customers to elect which tariff prescribed in a jurisdictional instrument applies to them.

Policy makers may also wish to consider whether it may be desirable to establish versions of the default market offer and the Victorian default offer that apply to retail customers who export.

Appendix A Examples TSS round 2 of engagement impacts

Table A.1: TSS round 2 examples of customer engagement influences

DNSP(s)	Reported customer impact
AusNet Services	For household and small businesses we targeted a co-designed tariff structure and transition that would be acceptable to all – the result was incorporated in our proposal and accepted by the AER. The pace of transition as well as the merits of difference cost reflective structures were discussed. Discussions with a large business advocate group informed our transition to altering the peak period windows of our tariffs for large business customers.
CitiPower, Powercor, United Energy	The simple two-part residential and small business ToU tariffs were a compromise between the 5 key pricing objectives identified by stakeholders Our residential and small business tariff assignment criteria we designed to minimise bill impacts and minimise the risk of vulnerable customer bill increases
Evoenergy	A key theme identified from consumer engagement for the development of Evoenergy's proposed TSS is that accessible information and education is critical to help consumers understand cost reflective tariffs and their benefits. In particular, Evoenergy has: • developed a suite of communication materials to support residential and LV commercial customers during the implementation of demand tariffs; and • hosted an 'Energy Matters' workshop in September 2018 to explain proposed changes to the tariff structure and build relationships with large customers.
Energex, Ergon Energy	EQL has introduced Primary and Secondary Load Control Network Tariffs for non-domestic use, or our Small and Large Business Customers. This was in response to many of our large business agricultural customers whom experience issues to metering limitations/education aspects and the introduction of LRMC based tariffs.
Tasnetworks	The customer research was utilised to discuss tariff assignment principles with customers and key stakeholders, resulting in a proposed shift from opt-in to opt-out assignment arrangements for time of use tariffs.

DNSP(s)	Reported customer impact
Ausgrid	One of the key aspects from the Customers At The Centre customer research program conducted during the initial proposal development was to explore customer acceptance and views of the ratio between fixed and variable charges in network pricing and to explore the variable charge structure (time-of-use, seasonal time-of-use, maximum capacity/ demand pricing). Results from the customer research influenced the initial TSS proposal in two main ways: • including Seasonal time of use as the main default cost reflective network pricing structure due to the general negative customer reactions to capacity pricing and it being the least acceptable to customers. • a higher fixed charge was considered acceptable by customers as long as the change was gradual and limited to an extent. The initial TSS proposal therefore included a slight rebalancing of cost recovery towards the fixed cost charges gradually over the 5 years. Some customer advocates and stakeholders did not agree with the above approach to the rebalancing towards higher fixed ratio and seasonal time of use as the default cost reflective network tariff and favoured a maximum demand tariff to be introduced for residential customers and to keep the fixed charge to variable charge ratio the same. A significant proportion of the re-analysis work and engagement activities for the revised TSS proposal was focused on investigating options for demand tariffs. Revised TSS | Our engagement with the Pricing Working Group resulted in co-designing the suite of residential and small business demand tariffs (3+3), that accommodated customer preferences for fixed vs TOU energy charge, and also allowed for an introductory tariff for customers assigned to a demand tariffs from flat tariff due to the accumulation meter failure. This tariff would allow 12 months of learning of consumption patterns before automatic reassignment to a demand tariff. Customer impact analysis informed the calibration of the new demand tariffs.
Endeavour Energy	Stakeholder engagement directly impacted tariff design, peak charging windows, transition period and assignment policy. • We introduced three new cost reflective tariff structures for residential and business customers. Structures implemented based on Demand, Transitional Demand and Seasonal TOU charging basis. • In response to retailer and customer feedback we simplified the structure of our new Demand tariff design. • Stakeholders agreed that the cost-reflective Transitional Demand tariff should replace the 'Flat' tariff as the default tariff option. • As per our commitment made to stakeholders during TSS1, we conducted a review of our charging windows, the result of which saw significant reduction in the "peak" period, improved simplicity by removing "shoulder" periods and introduced seasonality to better reflect the timing of network demand. We refined our calculation of LRMC in response to stakeholder concerns from TSS1. The new methodology includes a longer time horizon over which to calculate LRMC and includes repex.

DNSP(s)	Reported customer impact
SA Power Networks	Customers and stakeholders significantly influenced the approach taken to **transition to cost reflective tariffs** in a way that **manages customer impacts**. For example, SAPN observed that there was now greater customer and stakeholder support, expectation and customer preparedness for cost reflective tariffs along with other factors (e.g. the poor progress achieved with opt-in tariffs, higher penetration now of interval metering, etc), and changed its approach of offering cost reflective tariffs on an opt-in basis and instead made a cost reflective tariff (Time of Use, ToU) mandatory. Customers and stakeholders have sought and achieved greater simplicity in tariff design in order for **tariffs to be understandable**. Customers and retailers told SAPN that its tariffs were too complex. In response, among other examples, SAPN: • departed from its long-favoured demand tariffs and designed a Time of Use (ToU) tariff for residential customers; • ceased proposing a Critical Peak Price; • streamlined the number of tariffs and components within tariffs; and • simplified the tariffs for small business customers to a simplified ToU, noting business customer views that previous tariffs were too complex and that this complexity was unlikely to drive commensurate outcomes given the high diversity between small business demand. Customers and stakeholders have expected that tariff structures be designed to address **jurisdictional specific priorities**. For example: • In response to customer and stakeholder desires for SAPN to manage times of peak solar export (the solar trough) in order to mitigate potential network costs that need to be recovered from all customers including those without solar, SAPN designed 'solar sponge' tariffs to motivate customers to shift consumption to times of peak export. • in response to concerns from large business customers that tariffs should be better targeted to locational differences in demand, SAPN designed large business tariffs with charging windows that differ between CBD and non-CBD locations. Customers and stakeholders have been able to engage in resolving matters of **fairness and equity** which are not directly guided by the NER. For example, SAPN engaged with customers and stakeholders regarding concerns raised by large business customers on the approach of recovering jurisdictional Guaranteed Service Level (GSL) costs from all customers. Agreement was reached to instead recover GSL costs from residential and small business customers only. Furthermore, through the flexibility provided by the NER (being largely principles-based), SA customers and stakeholders were able to engage in a deliberative process with SAPN to define a set of priority issues that should be balanced in seeking to make decisions on tariff design and implementation. These priority issues are termed the "Customer Impact Principles" (simplicity, empower the customer, fairness and equity, and rules compliance). These customer impact principles have since been applied by SAPN as a set of guardrails to our tariff considerations, alongside the guardrails already provided by the NER.

Source: DNSP TSS survey Dec 2020-Jan 2021.

Table A.2: Examples of AER-requested TSS changes in TSS round 2

DNSP	Tariff structures	Form of transition	Pace of transition
AusNet Services	Yes. Wanted optionality for large business customers at revised proposal stage.	Yes. Required us to allow DER customers to opt onto flat tariffs (i.e. slowing down the pace of transition for these customers).	Encouraged us to reassign around 200k customers on a legacy time of use tariff onto our new cost reflective time of use tariff. (was not a strict requirement).
CitiPower, Powercor, United Energy	More cost reflective tariff structures for large business customers	They urged us to immediately reassign legacy ToU residential customers to the new ToU tariff	They urged us to increase the peak/off-peak ratio for our new ToU tariff
Evoenergy	Commercial Tariffs | 106 - LV KW Demand. Evoenergy proposed to replace the flat energy charge with a TOU energy charge. The AER Draft Decision (Sept 2018) did not approve so Evoenergy retained a flat energy charge. Residential Tariffs | The AER did not approve the change Evoenergy proposed to the Residential kW Demand tariff, which was to replace the flat energy charge with a TOU energy charge…. As a result, Evoenergy proposes to retain the current structure of the Residential kW demand tariff that includes anytime consumption charging.	Commercial Tariffs | 1. Removal of references to assigning LV commercial customers with embedded generators to the LV Capacity tariff. 2. Customers who receive a Type 4 meter as a replacement meter remain on their existing network tariff for 12 months before moving to a more cost-reflective network tariff. … Residential Tariffs | The AER required that customers who receive a Type 4 meter as a replacement for a Type 5 or 6 meter remain on their existing network tariff for 12 months before moving to a more cost-reflective network tariff.	
Endeavour Energy	Yes. The AER required the introduction of a Seasonal TOU tariff as a cost-reflective option to customers alongside our Demand and Transitional Demand tariffs	No. Opt-out was maintained.	Yes. The AER required Endeavour demonstrate annually that no less than 90% of customers on non cost-reflective tariff options would be financially better-off transitioning to the cost-reflective tariff option.

DNSP	Tariff structures	Form of transition	Pace of transition
Tasnetworks		Change tariff assignment policy from opt-in to an opt-out for small business (LV) customers – this extended the policy to all LV customers. Adopt the 12 month delay in tariff reassignment trigger for all customers to allow for 12 month data sampling period.	
Ausgrid	TSS proposal (April 2018)| The AER did not approve: • tariff assignment policy for residential and small business customers and recommended a single default tariff. Ausgrid's initial proposal included segmentation/different default tariff assignment of customers by <2, 2-15 and >15 MWh pa. • inclining block tariffs for residential and small business customers, required a demand tariff. Revised TSS (January 2019) | Ausgrid's revised proposal was: • Default demand tariffs for residential and small business customers with smart meters • Assignment of all customers to the most cost reflective tariff based on metering technology on 1 July 2019, incl. reassigning existing customers • TOU closed for new customers • Flat tariff, closed to new customers • Placeholder tariffs suitable for EV charging, and an Embedded Network tariff The AER's Final Decision was: • Approve demand tariffs for residential & Small Bus customers • No reassignment of existing customers on 1 July 2019 • TOU remains open and is an opt-out option from demand tariff • Rejected placeholder (EV and EN) tariffs Above shows the AER's draft decision influenced Ausgrid's revised proposal of demand tariffs (form of transition), and the AER's final decision slowed down the speed of transition compared to the January 2019 revised TSS proposal.		
Essential Energy	Demand for small customers during peak window only	Allowed opt out to flat tariffs	Back to allowing opt out

DNSP	Tariff structures	Form of transition	Pace of transition
Energex, Ergon Energy	The AER moved to change the availability of a selection of Network Tariffs from Retired to either Grandfathered or Open. The AER directed the introduction of new Basic Meter only Network Tariffs for Residential/Business Customers over 100MWh. The AER suggested change to the default tariff structure, instead directed that the submitted structure form the basis of a future network trial.	The AER required a number of changes to tariff assignment, including differing mandatory assignment processes during/post COVID for Residential and Small Business customers. The AER further required clarification to existing process for large customers.	

Source: DNSP TSS survey Dec 2020-Jan 2021

Appendix B Summary 2014 network pricing rule change

Table B.1: Summary of key changes made by the 2014 network pricing rule change

	Existing rules	Final rule
Pricing Principles		
Network pricing objective	No current objective.	Each network tariff should reflect the efficient costs of providing network services to the consumers assigned to the tariff.
Long run marginal cost	Distribution network service providers (DNSPs) must take into account long run marginal cost (LRMC) when setting network prices.	DNSPs must base network prices on LRMC.
Total efficient cost recovery	DNSPs must recover their allowed revenue with minimum distortion to efficient patterns of consumption.	The revenue recovered from each network tariff must reflect the DNSP's total efficient costs of serving the consumers assigned to that tariff. DNSPs must recover their allowed revenue in a way that minimises distortions to the price signals for efficient usage provided by LRMC based prices.
Consumer impact principles	No specific principle.	DNSPs must manage the impact of annual changes in network prices on consumers, eg by transitioning consumers to new network prices over one or more regulatory periods. DNSPs must set network prices which consumers are reasonably capable of understanding, ie consumers are able to relate their usage decisions to the price structure.
Jurisdictional obligation principle	No current principle, but the other pricing principles are not binding.	DNSPs may depart from network prices that meet the LRMC and total efficient cost recovery principles to the extent necessary to meet jurisdictional pricing obligations.
Stand alone and avoidable costs	The revenue expected to be recovered from each tariff class should lie between the stand alone cost of serving the relevant consumers and the avoidable cost of not serving those consumers.	No change except that "should" is changed to "must" to clarify that compliance with this principle is mandatory.
Network pricing process		
Process to develop network prices	Network prices are developed by DNSPs and approved by the AER on an annual basis.	DNSPs must develop a tariff structure statement (TSS) that sets out their network price structures. The TSS is approved by the AER as part of the regulatory determination process and applies for the five year regulatory control period. Price levels are approved by the AER on an annual basis.
Consultation	Neither DNSPs nor the AER are required to consult with stakeholders on network price structures.	DNSPs are required to describe how they have consulted with retailers and consumers on the design of network prices and sought to address their concerns. The AER must invite stakeholder submissions on the TSS.
Timing	No set timeframe by which network prices are to be approved and notified.	Binding timeframes are included so that network prices are generally approved at least six weeks before they commence, except in the first year of a regulatory period. To allow this to occur, DNSPs must submit their annual pricing proposals earlier; TNSPs (other than those in Victoria) must publish their prices earlier; and the AER must approve network prices within 30 business days.

Source: AEMC

Appendix C Commentary on applying each pricing rule to exports

Key: ✓will likely apply as intended, **?** may benefit from clarification, **×** requires amendment, **n/a** not applicable

Rule	Export pricing comments	Possible modification
6.18.1 Application of this Part This Part applies to tariffs and *tariff classes* related to *direct control services*.	✓ The distribution pricing rules (NER Chapter 6 Part I) apply to tariffs and tariff classes related to direct control services (i.e. standard control services and alternative control services). **?** The AEMC should confirm whether tariffs for a direct control service can include a payment by a DNSP to the customer. If so, are there any limits on this, eg is a credit to reduce other charges under the tariff different to a situation where there could be net payment from the DNSP to the customer? **?** They would not apply to any export services provided as negotiated services.	
6.18.1A Tariff structure statement		
(a) A *tariff structure statement* of a *Distribution Network Service Provider* must include the following elements:		
(1) the *tariff classes* into which *retail customers* for *direct control services* will be divided during the relevant *regulatory control period*;	✓ Could have tariff class for exports or for bi-directional users, with export charge and/or negative price just being another tariff charging parameter.	
(2) the policies and procedures the *Distribution Network Service Provider* will apply for assigning *retail customers* to tariffs or reassigning *retail customers*	✓ The presence and scale of export, and whether it is dynamically controlled could all become tariff or tariff class eligibility criterion.	

Rule	Export pricing comments	Possible modification
from one tariff to another (including any applicable restrictions);		
(3) the structures for each proposed tariff;	✓ Would be required for export pricing and would support certainty and predictability over the TSS period for DER exporters.	
(4) the *charging parameters* for each proposed tariff; and	✓ Would be required for export pricing and would support certainty and predictability over the TSS period for DER exporters.	
(5) a description of the approach that the *Distribution Network Service Provider* will take in setting each tariff in each *pricing proposal* of the *Distribution Network Service Provider* during the relevant *regulatory control period* in accordance with clause 6.18.5.	✓ Would be required for export pricing and would support certainty and predictability over the TSS period for DER exporters.	
(b) A *tariff structure statement* must comply with the *pricing principles for direct control services*.	**?** Subject to observations below on the 6.18.5 pricing principles (e.g. if export charging parameters are to be excluded from some of these).	
(c) A *Distribution Network Service Provider* must comply with the *tariff structure statement* approved by the *AER* and any other applicable requirements in the *Rules*, when the provider is setting the prices that may be charged for *direct control services*.	✓ Would be required for export pricing and would support certainty and predictability over the TSS period for DER exporters.	
(d) Subject to clause 6.18.1B, a *tariff structure statement* may not be amended during a *regulatory control period*.	✓ Because the distribution service definition clarifications for export services won't be reflected in the revenue allowances for current TSS periods, it is likely to be inappropriate to allow the current TSSs to be opened up as a result of this rule change. The	The amended rules may need transitional provisions so that the changes do not commence until the start of each DNSPs' next regulatory control period, but those changes are reflected in upcoming regulatory proposals and proposed TSSs.

Rule	Export pricing comments	Possible modification
Note | Rule 6.13 still applies in relation to a *tariff structure statement* because that rule deals with the revocation and substitution of a distribution determination (which includes a *tariff structure statement*) as opposed to its amendment.	next TSSs would need to be made concurrent with fit-for-purpose revenue allowances underpinned by reasonable forecasts of demand for consumption and export services.	The AEMC will need to consider the timing of each DNSPs' reset to decide then the rules should apply, eg what to do if a regulatory proposal and proposed TSS have already been submitted or are to be submitted shortly after the rule is made.
(e) A *tariff structure statement* must be accompanied by an *indicative pricing schedule* which sets out, for each tariff for each *regulatory year* of the *regulatory control period*, the indicative price levels determined in accordance with the *tariff structure statement*.	✓ Would be required for export pricing and would support certainty and predictability over the TSS period for DER exporters. **?** We note that in practice the marginal cost or benefit of providing export services may vary markedly over a regulatory control period (i.e. the short-term) at a given connection point if the corresponding grid export capacity augmentation need to be made and was then made or if the location faced capacity constraint in a period of peak consumption use. Pricing principles for export will need to decide whether short-term marginal cost pricing will be permissible as opposed to LRMC pricing.	
6.18.1B Amending a tariff structure statement with the AER's approval [*Note the rest of this clause has been removed from this table, as no other export differentiation was considered necessary*]	✓ retain for consistency	AEMC could exclude this rule change from the scope of this clause. This would be redundant if the comments in 6.18.1(A)(d) are acted upon.

Rule	Export pricing comments	Possible modification
6.18.1C Sub-threshold tariffs (a) No later than four months before the start of a *regulatory year* (other than the first *regulatory year* of a *regulatory control period*), a *Distribution Network Service Provider* may notify the *AER*, affected *retailers* and affected *retail customers* of a new proposed tariff (a **relevant tariff**) that is determined otherwise than in accordance with the *Distribution Network Service Provider's* current *tariff structure statement*, if both of the following are satisfied: (1) the *Distribution Network Service Provider's* forecast revenue from the relevant tariff during each *regulatory year* in which the tariff is to apply is no greater than 0.5 per cent of the *Distribution Network Service Provider's annual revenue requirement* for that *regulatory year* (the **individual threshold**); and (2) the *Distribution Network Service Provider's* forecast revenue from the relevant tariff, as well as from all other relevant tariffs, during each *regulatory year* in which those tariffs are to apply is no greater than one per cent of the *Distribution Network Service Provider's annual revenue requirement* for that *regulatory year* (the **cumulative threshold**). (b) Notwithstanding any other provision in the *Rules* to the contrary, a relevant tariff notified by the *Distribution Network Service Provider* in accordance with paragraph (a) is, for the remainder of the *regulatory control period* in which the notification is given: (1) not required to comply with the *pricing principles for direct control services*; and (2) for the purposes of the submission and approval of a *pricing proposal*, deemed to comply with the *Distribution Network Service Provider's* current *tariff structure statement*,	**?** Requires a decision about whether equivalent small-scale trials (<0.5%of revenue pa or <1% for balance of TSS period) of export tariffs will be permitted immediately, or if the requirement to wait till the next TSS period should also apply here? **Note** that because trials also circumvent the need for compliance with the pricing principles and current TSS, they may not have sufficient customer protections.	This could be permitted on the condition that: • trial participation is voluntary (in which case, why would anyone volunteer to pay more unless it includes reward payments), or • the trial is developed through customer consultation. This issue will not arise if the rules do not commence until the start of the next TSS period.

Rule	Export pricing comments	Possible modification
unless, at any point in time after the notification of the relevant tariff is given under paragraph (a) (the **post-notification point**), either the individual threshold or the cumulative threshold (in each case calculated using actual rather than forecast revenue) are exceeded by virtue of the amount of revenue that is attributable to the relevant tariff, in which case sub-paragraphs (1) and (2) cease to apply to the relevant tariff in relation to the *regulatory years* that commence after the post-notification point. (c) Where sub-paragraphs (b)(1) and (2) cease to apply to a relevant tariff in accordance with paragraph (b), then sub-paragraphs (b)(1) and (2) will be taken to continue to apply to other relevant tariffs that were notified before the post-notification point, but only to the extent that those sub-paragraphs would apply if the first-mentioned relevant tariff were not a relevant tariff.		

Rule	Export pricing comments	Possible modification
6.18.2 Pricing proposals [*Note the rest of this annual pricing proposal clause has been removed from this table, as no other export differentiation was considered necessary*]	✓ export charges would need to fall within the annual proposal process once they have been implemented in either a TSS or a trial tariff. None of these clauses seems to require amendment for steady state future application to export pricing.	Consider if a carve out is needed for transition until the next round of TSSs (as flagged above)
6.18.3 Tariff classes (a) **[Deleted]**. (b) Each *retail customer* for *direct control services* must be a member of 1 or more *tariff classes*. (c) Separate *tariff classes* must be constituted for *retail customers* to whom *standard control services* are supplied and *retail customers* to whom *alternative control services* are supplied (but a *retail customer* for both *standard control services* and *alternative control services* may be a member of 2 or more *tariff classes*). (d) A *tariff class* must be constituted with regard to: (1) the need to group *retail customers* together on an economically efficient basis; and (2) the need to avoid unnecessary transaction costs.	✓ tariff classes would need to account for export charging customer cohorts. Note that *if* export charges are just added as a charging parameter to existing consumption tariffs or as a new tariff, then current tariff classes may be unaffected by export pricing.	The AEMC may wish to clarify the definition of tariff classes, which affects the application of this clause and 6.18.3
6.18.4 Principles governing assignment or re-assignment of retail customers to tariff classes and assessment and review of basis of charging	**?** The application of this clause will depend on whether export services are a separate tariff class, or just a new tariff or charging parameter. If they are a new tariff class then this clause could be problematic.	

Rule	Export pricing comments	Possible modification
(a) In formulating provisions of a distribution determination governing the assignment of *retail customers* to *tariff classes* or the re-assignment of *retail customers* from one *tariff class* to another, the *AER* must have regard to the following principles:		
(1) *retail customers* should be assigned to *tariff classes* on the basis of one or more of the following factors: (i) the nature and extent of their usage; (ii) the nature of their *connection* to the *network*; (iii) whether remotely-read interval metering or other similar metering technology has been installed at the *retail customer's* premises as a result of a *regulatory obligation or requirement*;	× These may require augmentation to also account for nature and extent of their export, unless the nature and extent of their usage or the nature of their connection is sufficient.	Likely requires modification to also account for nature and extent of their export
(2) *retail customers* with a similar *connection* and usage profile should be treated on an equal basis;	× Same as (1) above	Likely require modification to also account for nature and extent of their export
(3) however, *retail customers* with micro-generation facilities should be treated no less favourably than *retail customers* without such facilities but with a similar load profile;	×	Likely require removal
(4) a *Distribution Network Service Provider's* decision to assign a customer to a particular *tariff class*, or to re-assign a customer from one *tariff class* to another should be subject to an effective system of assessment and review.	✓	
Note: If (for example) a customer is assigned (or reassigned) to a *tariff class* on the basis of the		

Rule	Export pricing comments	Possible modification
customer's actual or assumed *maximum demand*, the system of assessment and review should allow for the reassignment of a customer who demonstrates a reduction or increase in *maximum demand* to a *tariff class* that is more appropriate to the customer's *load* profile.		
(b) If the *charging parameters* for a particular tariff result in a basis of charge that varies according to the usage or load profile of the customer, a distribution determination must contain provisions for an effective system of assessment and review of the basis on which a customer is charged.	× Needs to also account for export charging parameters	Requires modification
6.18.5 Pricing principles	**?** A broader question arises for some of these principles and their application if you consider export services to be a *discretionary purchase decision* as opposed to the *essential service purchase* from normal electricity consumption services.	
Network pricing objective		
(a) The *network pricing objective* is that the tariffs that a *Distribution Network Service Provider* charges in respect of its provision of *direct control services* to a *retail customer* should reflect the *Distribution Network Service Provider's* efficient costs of providing those services to the *retail customer*.	**?** The AEMC should confirm that the references to 'charges' and 'costs' can accommodate tariffs that involve the DNSP paying the customer where exports reduce the DNSP's efficient costs.	

Rule	Export pricing comments	Possible modification
Application of the pricing principles		
(b) Subject to paragraph (c), a *Distribution Network Service Provider's* tariffs must comply with the pricing principles set out in paragraphs (e) to (j).	✓	
(c) A *Distribution Network Service Provider's* tariffs may vary from tariffs which would result from complying with the pricing principles set out in paragraphs (e) to (g) only:	✓ probably needed for the carve out in (j)	
(1) to the extent permitted under paragraph (h); and	**?** The need for this may depend on how export tariffs are introduced. See comments below	
(2) to the extent necessary to give effect to the pricing principles set out in paragraphs (i) to (j).	✓ probably needed for the carve out in (j) **?** unclear if (i) should apply. See comments below.	
(d) A *Distribution Network Service Provider* must comply with paragraph (b) in a manner that will contribute to the achievement of the *network pricing objective*.	✓	
Pricing principles		
(e) For each *tariff class*, the revenue expected to be recovered must lie on or between:	✓	There may be contingent modification required depending on whether export charges are their own tariff class or just additional charging parameters on new tariffs.
(1) an upper bound representing the stand alone cost of serving the *retail customers* who belong to that class; and	✓	

Rule	Export pricing comments	Possible modification
(2) a lower bound representing the avoidable cost of not serving those *retail customers*.	✓	Possibly needs modification, depending on whether export charges are their own tariff class or just additional charging parameters on new tariffs.
(f) Each tariff must be based on the *long run marginal cost* of providing the service to which it relates to the *retail customers* assigned to that tariff with the method of calculating such cost and the manner in which that method is applied to be determined having regard to: (1) the costs and benefits associated with calculating, implementing and applying that method as proposed; (2) the additional costs likely to be associated with meeting demand from *retail customers* that are assigned to that tariff at times of greatest utilisation of the relevant part of the *distribution network*; and (3) the location of *retail customers* that are assigned to that tariff and the extent to which costs vary between different locations in the *distribution network*.	? This will depend on: 1) What costs are allocated to these (e.g. incremental only) 2) Whether DNSPs are permitted to provide short-run or locational signals for exports (e.g. negative prices) 3) Whether the AEMC wants to signal that export prices should vary by location across a DNSP's network area if the costs of exports vary in different locations – nothing that para (f)(3) is generally not complied with in practice for consumption tariffs at present 4) Whether both charges and payments are envisaged and whether further guidance should be provided on how any payments to the customer should be set, eg based on the reduction in long run marginal cost. Note that applying this rule could add a lot of compliance cost for limited benefit given the imprecision of LRMC estimation, potential benefit of short-run signaling and scope for other binding jurisdictional or customer preference requirements to drive prices below this economic cost concept. Various submissions have flagged the need to review application of this to exports (e.g. AER)	May require modification

Rule	Export pricing comments	Possible modification
(g) The revenue expected to be recovered from each tariff must:	**?** Requires discussion for (1)	
(1) reflect the *Distribution Network Service Provider's* total efficient costs of serving the *retail customers* that are assigned to that tariff;	This rule inherently requires DNSPs to do fully allocated cost modelling. What that will force them to show is the actual estimated cost of providing export services (including residual costs). This is burdensome to model (relying heavily on assumptions) and may give fuel to criticism that the AEMC cannot avoid if it is to preserve jurisdictions and customers rights to oppose fully cost reflective pricing.	May require modification depending on how residual costs are to be treated for export tariffs.
(2) when summed with the revenue expected to be received from all other tariffs, permit the *Distribution Network Service Provider* to recover the expected revenue for the relevant services in accordance with the applicable distribution determination for the *Distribution Network Service Provider*; and	✓	
(3) comply with sub-paragraphs (1) and (2) in a way that minimises distortions to the price signals for efficient usage that would result from tariffs that comply with the pricing principle set out in paragraph (f).	✓	Is clarification needed that 'usage' means use of the distribution service, and therefore include both consumption and export usage (i.e. *not* just energy usage)
(h) A *Distribution Network Service Provider* must consider the impact on *retail customers* of changes in tariffs from the previous *regulatory year* and may vary tariffs from those that comply with paragraphs (e) to (g) to the extent the *Distribution Network Service*	✓ The need for this will depend on how export tariffs are introduced. If it is a new service on a prospective basis with grandfathering, then this provision for managing bill impact of change isn't going to need to be used but does no harm. If it	

Rule	Export pricing comments	Possible modification
Provider considers reasonably necessary having regard to:	applies to all customers and some existing costs are reallocated to the export charge, then this paragraph could be a useful transition tool.	
(1) the desirability for tariffs to comply with the pricing principles referred to in paragraphs (f) and (g), albeit after a reasonable period of transition (which may extend over more than one *regulatory control period*);	**?** The AEMC want to review this clause given the pace of consumption transition. As above, the application of this clause for export prices will depend on how costs are allocated to the service	
(2) the extent to which *retail customers* can choose the tariff to which they are assigned; and	✓ this clause could be very useful if customers have a choice of export services	
(3) the extent to which *retail customers* are able to mitigate the impact of changes in tariffs through their usage decisions.	**×** would likely require addition of 'and export' to cover both usage and export decisions.	Modify as in 6.18.4 clauses provisions above to reflect export
(i) The structure of each tariff must be reasonably capable of being understood by *retail customers* that are assigned to that tariff, having regard to: (1) the type and nature of those *retail customers*; and (2) the information provided to, and the consultation undertaken with, those *retail customers*.	**?** The AEMC may want to consider this clause in light of experience with consumption tariff reform. Also is it sufficient if only their retailer or aggregator understands it and then buries it in a customer service package?	
(j) A tariff must comply with the *Rules* and all *applicable regulatory instruments*.	✓ likely needed to preserve jurisdictions' desire to influence how essential services are provided and priced. E.g. states could regulate a minimum 'free' export threshold for their jurisdiction as a license condition (e.g. in Vic or SA)	

Rule	Export pricing comments	Possible modification
6.18.6 Side constraints on tariffs for standard control services (a) This clause applies only to *tariff classes* related to the provision of *standard control services*. (b) The expected weighted average revenue to be raised from a *tariff class* for a particular *regulatory year* of a *regulatory control period* must not exceed the corresponding expected weighted average revenue for the preceding *regulatory year* in that *regulatory control period* by more than the permissible percentage. (c) The permissible percentage is the greater of the following: (1) the CPI-X limitation on any increase in the *Distribution Network Service Provider's* expected weighted average revenue between the two *regulatory years* plus 2%; Note: The calculation is of the form (1 + CPI)(1 – X)(1 + 2%) (2) CPI plus 2%. Note: The calculation is of the form (1 + CPI)(1 + 2%) (d) In deciding whether the permissible percentage has been exceeded in a particular *regulatory year*, the following are to be disregarded: (1) the recovery of revenue to accommodate a variation to the distribution determination under rule 6.6 or 6.13;	**?** There may be contingent modification required depending on whether export charges are their own tariff class or just additional charging parameters on existing/new tariffs.	

Rule	Export pricing comments	Possible modification
(2) the recovery of revenue to accommodate pass through of *designated pricing proposal charges* to *retail customers*; (3) the recovery of revenue to accommodate pass through of *jurisdictional scheme amounts* for *approved jurisdictional schemes*. (e) **[Deleted]**.		
6.18.7 Recovery of designated pricing proposal charges 6.18.7A Recovery of jurisdictional scheme amounts	n/a	
6.18.8 Approval of pricing proposal [*Note the rest of this clause has been removed from this table, as no export differentiation was considered necessary*]	✓	

Rule	Export pricing comments	Possible modification
6.18.9 Publication of information about tariffs and tariff classes (a) A *Distribution Network Service Provider* must maintain on its website: (1) its current *tariff structure statement*; (2) its current *indicative pricing schedule*; and (3) a statement of the provider's *tariff classes* and the tariffs applicable to each class. (a1) A *Distribution Network Service Provider* must, within 5 *business days* from the date the *AER publishes* a distribution determination under paragraph 6.11.2(2) for that *Distribution Network Service Provider*, publish on its website the *tariff structure statement* approved or contained in that distribution determination and the accompanying *indicative pricing schedule*. (b) A *Distribution Network Service Provider* must publish on its website the information referred to in paragraph (a) within 5 *business days* from the date the *AER publishes* an *approved pricing proposal* under paragraphs 6.18.8(c2) or 6.18.8(c3) (as applicable) for that *Distribution Network Service Provider*.	✓	
6.19. Data Required for Distribution Service Pricing 6.19.1 Forecast use of networks by Distribution Customers and Embedded Generators Any information required by *Distribution Network Service Providers* must be provided by *Service*	**?** Need to satisfy ourselves that use can mean for both consumption or export. It may benefit from explicit confirmation in the AEMC decision.	

Rule	Export pricing comments	Possible modification
Applicants as part of the *connection* and access requirements set out in Chapter 5.		
6.19.2 Confidentiality of distribution network pricing information (a) Subject to the Law and the *Rules*, all information about a *Service Applicant* or *Distribution Network User* used by *Distribution Network Service Providers* for the purposes of *distribution service* pricing is confidential information. (b) No requirement in this Chapter 6 to publish information about a *tariff class* is to be construed as requiring publication of information about an individual *retail customer*.	✓	