

Australian Energy Market Commission

RULE DETERMINATION

NATIONAL ELECTRICITY AMENDMENT (GLOBAL SETTLEMENT AND MARKET RECONCILIATION) RULE 2018

PROPONENT

Australian Energy Market Operator

6 DECEMBER 2018

RULE

INQUIRIES

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ABOUT THE AEMC

The AEMC reports to the Council of Australian Governments (COAG) through the COAG Energy Council. We have two functions. We make and amend the national electricity, gas and energy retail rules and conduct independent reviews for the COAG Energy Council.

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SUMMARY

- 1 The Australian Energy Market Commission (AEMC, or Commission) has made a final rule to introduce a 'global settlement' framework for settlement of the demand side of the wholesale electricity market. The final rule, which is a more preferable rule, is in response to a rule change request submitted by the Australian Energy Market Operator (AEMO) on 16 March 2018. The final rule is generally consistent with AEMO's rule change request but varies in some specific design elements of global settlements.

What are settlements, 'settlements by difference' and 'global settlements'?

- 2 The national electricity market (NEM) is a gross electricity pool market operated by AEMO. All electricity supplied to the market and consumed by end users is transacted at the spot price for each trading interval in each region. The market settlement process requires that for each trading interval market generators are paid for the energy they provide to the NEM and market customers pay for the energy they use. Market customers are mainly electricity retailers who purchase wholesale electricity to on-sell to their retail customers, but also include some large industrial customers.
- 3 Under the current market settlement framework, known as 'settlement by difference', electricity supplied to a distribution area is billed by AEMO to the incumbent retailer known as the local retailer except for the loss-adjusted metered electricity that is consumed by the customers of independent retailers within the area. This means that the local retailer for an area bears the risk of all residual electricity losses in that area—known as unaccounted for energy (UFE). UFE includes unaccounted for technical losses, commercial losses and errors in estimating the half-hourly—soon to be five minute—consumption of basic metering installations that do not keep track of how electricity usage varies throughout the day.
- 4 Under a global settlement framework, every retailer is billed for the loss-adjusted metered electricity that is consumed by their customers within the area. UFE is then allocated to market customers (mostly retailers) on the basis of a pre-determined methodology. Under the Commission's methodology, UFE is allocated to all market customers in a distribution network (local area), pro-rated based on their 'accounted-for' energy.

Why move to a global settlements framework?

- 5 The existing settlements by difference framework has been in place since the start of the NEM. At the time, the local retailer in each local area supplied the vast majority of all customers in the area. It was therefore appropriate for the local retailer to bear the risk of UFE within the area. With the introduction of retail competition this is no longer the case—the local retailer, a notionally anachronistic role, is just one of a number of competitive retailers servicing an area. In this context, the Commission agrees with AEMO that settlements by difference is no longer a fit for purpose approach to settlements. Furthermore, this is the appropriate time to move to a global settlements approach because its implementation can be synchronised with implementation of the five minute settlement rule change which will substantially reduce implementation costs.
- 6 The introduction of global settlements will result in three key benefits:

1. Improved transparency, leading to fewer settlement disputes between retailers and lower levels of UFE over time

- 7 Under global settlements, AEMO will be able to fully reconcile energy within each distribution network because it will receive data from all retailers in the area. Full reconciliation will allow for better and timelier identification, mitigation and prevention of settlement errors within the six month settlement finalisation period. This will reduce costs of resolving settlement disputes, which are currently substantial.
- 8 Increased transparency of UFE will also allow for analysis and investigation of UFE to take place to reduce UFE. The final rule puts in place a reporting framework for AEMO to publish information and analysis of UFE. This will allow for actions to be taken by relevant parties to reduce UFE, where it is efficient to do so.

2. Competition on equal terms

- 9 No matter how well designed, some UFE is inevitable within an electricity system. This is a shared inefficiency of the system. The Commission considers that to facilitate effective retail competition in the long term it is important that where there are shared market inefficiencies, they are shared in a manner which does not distort competition by being disproportionately allocated to one group of retailers over others.
- 10 At market start, settlements by difference was a practical compromise. The full allocation of UFE to local retailers did not distort competition because local retailers supplied the vast majority of customers. However, as retail competition has developed over time, local retailers have supplied a lower and lower proportion of customers within their local area. For example, in Victoria and NSW, local retailers now, on average, supply less than 25 and 30 per cent of small customers respectively. Furthermore, within these states there are local areas where the local retailer share is now below 15 per cent and continuing to decline. The Commission considers that it is now time for settlements arrangements to progress to the more advanced global settlements framework and notes advice from AEMO that the transition to five minute settlements provides an opportunity to implement global settlement at least cost.

3. Improved risk allocation driving enhanced incentives

- 11 The Commission considers that generally risks should be allocated to those parties that are best placed to manage them. This provides incentives on those parties that are able to manage risks, to do so at the lowest possible cost.
- 12 Under settlements by difference the local retailer bears the risk of UFE within its area. This provides the local retailer with an incentive to reduce UFE. However, the local retailer has limited control over UFE other than at its customers' connection points. In contrast, all independent retailers face a disincentive to reduce UFE under settlements by difference because the local retailer—the independent retailers' competitor—is bearing the risk of UFE. This is despite independent retailers having some ability to reduce UFE at their customers' connection points, for example, by installing advanced metering with tampering detection.
- 13 Under the Commission's global settlements design, UFE is allocated to all retailers in the local area, pro-rated based on their 'accounted-for' energy. By allocating the risk of UFE to

retailers they will be provided with incentives to, where possible, reduce UFE because reductions in UFE result in reductions in the risks borne by them. Through this process, it is expected that UFE levels will be lower under global settlement. Such an outcome was observed over time in the New Zealand electricity market after global settlement was introduced in 2008.

Costs and benefits of global settlements

14 The Commission expects the largest benefits of global settlement to come from a reduction in UFE in the market, and from avoiding settlement disputes. Other possible benefits that could be material, include retail prices being more cost-reflective, contributing to the dynamic efficiency of the market over time. Further, with the introduction of five minute settlement, there will be an increase in the estimation of consumption from the 6 million accumulation meters installed in the NEM, in addition to the 3.6 million installed interval meters that will also need to be profiled for the first time, increasing the likelihood of errors in estimating when consumption occurred, and the incentives to reduce UFE. As such, the Commission expects the annual benefit of a move to global settlements to be significant in the long term.

15 In comparison, while there will be one-off implementation costs from a move to global settlement, they are expected to be relatively marginal. AEMO will incur some material costs from updating their IT systems, estimated at \$5 million. Networks and meter data providers will incur some costs associated with the calculation of unmetered loads and changes to data processing and transfers. The impact on retailers may be varied depending on the versatility of retailer IT and billing systems. Most of the costs to AEMO, networks, metering data providers and retailers are expected to be incremental to the costs of implementing the five minute settlement rule owing to significant synergies between the two implementation projects. These synergies involve simultaneous:

- changes to AEMO, retailer and metering service provider IT systems and processes
- mobilisation of staff, teams and resources to achieve the changes
- changes to data provision and format processes.

16 Based on this analysis, the Commission considers that the benefits are likely to be greater than the costs associated with global settlement, providing for efficiency benefits from which consumers of electricity will ultimately benefit over the long term. This is particularly the case due to the synergies that can be achieved by aligning the changes with five minute settlement.

Other National Electricity Objective (NEO) considerations

17 Global settlements is likely to produce a net benefit to consumers, relative to the status quo. However, the Commission notes that this would not need to be the case for the change to meet the NEO. This is because the relevant counterfactual to moving to global settlements is not the status quo in perpetuity. In particular:

1. If a global settlements regime was not introduced at this time, the Commission would likely require AEMO to obtain the additional information from participants to allow the calculation of UFE to increase transparency and reduce settlement dispute resolution costs. This change would incur the costs of changes to data provision, additional

information provision for unmetered loads and AEMO system changes to calculate UFE. However, it would come without the incentive and competition benefits described above.

2. As with markets around the world where retail competition is maturing, a move to global settlements is likely to be required at some point in the future. The further development of retail competition across the NEM is likely to continue to decrease the proportion of customers served by local retailers in their local areas. This will exacerbate the problem of local retailers bearing the costs and risks of UFE and is likely to eventually necessitate a move to a global settlements framework. Importantly, if this occurs at a later date it would result in substantially higher implementation costs when the systems changes are not made in synergy with the five minute settlement rule change.

Broader issues related to costs of market reforms

- 18 The Commission has had regard to the wide variety of cost estimates of implementation of global settlements provided by retailers in their submissions in undertaking its NEO assessment and has attempted to minimise these costs in designing the implementation schedule. However, the Commission notes that the original NEM market design, including the rules and AEMO's processes and procedures were established at a time when retail competition did not exist for small customers. Many of these processes will need to change to facilitate effective retail competition in the long term regardless of whether global settlements is introduced. Where individual participants have built and designed internal systems in ways which are costly to change, the Commission does not consider, when assessing this rule change request against the NEO, that these costs should be given equal weight to the market wide efficiency improvements to be gained from the introduction of global settlement.

- 19 These issues around how participant's specific investment decisions affects overall implementation costs are not new. For example, many participants raised similar issues in the five minute settlement rule change. They are also likely to arise in future rule changes. For example, the Commission and AEMO are providing advice to the COAG Energy Council on potential changes to update the customer transfer process which will likely require systems changes by retailers. Participants entering the NEM and making investment decisions regarding systems and processes are aware that the energy market is undertaking significant structural changes. In this context, in consideration of necessary updates to NEM architecture, the Commission puts greater weight on the efficient allocation of costs by market participants. This is particularly the case when the participant systems have not been designed to allow cost effective modifications in response to regulatory reforms.

Key aspects of global settlements design under the rule

- 20 Within a global settlements design there are a number of important elements. The table below summarises the Commission's final rule in relation to these elements. It also highlights the differences in these design elements between AEMO's proposed rule, and the Commission's more preferable draft and final rule. The final rule will reduce implementation costs compared to AEMO's proposed rule, while maintaining almost all the benefits. There are two main differences between the draft and final rule, namely:

1. Transparency framework — the draft rule placed an obligation on AEMO to calculate UFE at the transmission note identifier (TNI) level to assist in the identification of causes of

UFE. To implement this, all unmetered loads and NMI's within a virtual transmission node (VTN) would need to be allocated to a specific TNI. Participants could also request AEMO to undertake a technical study if UFE levels within a TNI exceeded an AEMO defined threshold. Based on submissions to the draft determination, the Commission considered the costs of this process is likely to outweigh its benefits, especially within the implementation timeframe for global settlements. The final rule removes these requirements and replaces them with an overarching AEMO UFE reporting requirement. This will include regular reports on levels, causes and ways to reduce UFE, and information gathering powers to collect necessary data from the relevant parties.

2. Implementation framework — the draft rule established a soft start for global settlements on 1 July 2020, before the draft rule commences on 1 July 2021. This schedule aligned the financial commencement of Global and five minute settlements. Several stakeholders submitted that having both five minute and global settlements commence on the same day may increase the financial risk associated with the relevant system changes. Instead, the final rule adopts a suggestion by AEMO that the soft start of global settlements begin on 1 July 2021 alongside the full commencement of five minute settlement. The full commencement of global settlement then begins on 6 February 2022. The Commission agrees with AEMO that this approach will maintain the benefits on alignment of the process and system changes of the two rule changes while reducing the risks of simultaneous financial commencement.

Table 1: Comparison of AEMO's proposal and the Commission's draft and final rule

ISSUE	AEMO PROPOSED RULE	DRAFT RULE	FINAL RULE
Allocation of UFE	All market customers (i.e. retailers) in proportion to their share of the loss adjusted consumption within the area.	No change from proposed rule.	No change from draft rule.
Level UFE is allocated	UFE be allocated at the transmission connection point level.	UFE to be allocated at the local area (i.e. DNSP network) level.	No change from draft rule.
Treatment of VTNs	Remove the ability for network businesses to assign customers to VTNs. A range of options proposed to facilitate their removal.	VTNs are retained for settlement purposes and there is no change to the VTN policy arrangements.	No change from draft rule.
Information requirements	N/A. With the allocation of UFE at the TNI, no additional requirements	Require mapping of NMIs to TNI to allow for reporting of UFE at the	Removal of the requirement in the draft rule for NMIs to be

ISSUE	AEMO PROPOSED RULE	DRAFT RULE	FINAL RULE
	were proposed.	TNI level. AEMO also required to conduct technical studies if requested when UFE exceeds a threshold within a TNI.	mapped to TNIs and technical studies to be undertaken where UFE exceeds an AEMO defined threshold. AEMO to introduce a UFE reporting and analysis framework. To be developed through consultation with industry.
Unmetered loads	AEMO proposed two options for the treatment of unmetered loads under global settlement which would avoid all retailers being incorrectly charged for this energy.	The energy associated with off-market (i.e. non-type 7) unmetered loads is to be explicitly included in AEMO's settlement processes. AEMO is to include in its metrology procedures guidance on how this should occur.	Minor changes from draft rule. As a result of the information requirements changes (described in the row above), NMIs will not be required to be allocated to TNIs within VTNs. More flexibility is also provided to AEMO regarding how NMIs for unmetered loads are treated (i.e. grouped or individual).
Implementation on timeframes	Broadly align implementation with that of five minute settlement.	Implement the rule on the same timeframes as five minute settlement, including procedure and guideline changes and the commencement date. Add a compulsory soft start for global settlements, starting twelve months prior to commencement.	Align AEMO procedural and guideline changes with those of five minute settlement. Commence the global settlement soft start at the same time as five minute settlement commencement on 1 July 2021. Mandatory information provision for the two changes aligned.

ISSUE	AEMO PROPOSED RULE	DRAFT RULE	FINAL RULE
			Financial start of global settlement approximately 7 months after soft start, on 6 February 2022.

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1 AEMO'S RULE CHANGE REQUEST AND BACKGROUND

1.1 The rule change request

On 16 March 2018, the Australian Energy Market Operator (AEMO) submitted a rule change request to the Australian Energy Market Commission (AEMC or Commission) proposing to move to a 'global settlement' framework for settlement of the demand side of the wholesale electricity market. AEMO considers that a global settlement framework will improve the efficiency of the market by providing a level playing field for electricity retailers, and enable AEMO to more accurately reconcile the wholesale electricity market.

Along with the rule change request and proposed rule, AEMO also provided a 'high level design' document that set out an operational design for global settlement.

1.2 Current arrangements

1.2.1 Settlement by difference and UFE

The national electricity market (NEM) is a gross pool electricity market operated by AEMO. All electricity supplied to the market and consumed by end users is transacted at the spot price for each trading interval in each region.¹ The market settlement process ensures that for each trading interval market generators are paid for the energy they provide to the NEM and market customers pay for the energy they use. Market customers are mainly electricity retailers who purchase wholesale electricity to on-sell to their retail customers.²

The current retail settlement framework, known as 'settlement by difference', has been in place since the start of the NEM. Under this approach, all electricity is billed to the local retailer except for the loss-adjusted metered electricity that is consumed by the customers of independent retailers. This means that the local retailer for an area bears the cost and risk of all residual electricity losses, including unaccounted for technical losses and other retailers' commercial losses. Box 1 explains the different types of electricity losses that exist in the settlement process.

BOX 1: TYPES OF ELECTRICITY LOSSES

Technical losses mainly consist of power dissipation in electricity system components such as distribution lines and transformers. Technical losses are estimated by applying estimated distribution loss factors (DLFs) and transmission marginal loss factors (MLFs). The DLFs used in settlements are single, annual values that represent average network losses. They are calculated by the relevant Distribution Network Service Provider (DNSP) using methodologies

1 Trading intervals in the NEM are currently 30 minute periods, reducing to five minute periods in July 2021 as a result of the National Electricity Amendment (Five minute settlement) Rule 2017 No 15. The Five minute settlement final rule and determination can be viewed at: <https://www.aemc.gov.au/rule-changes/five-minute-settlement>

2 Remaining market customers tend to be large industrial electricity users such as smelters. See current market registration lists at www.aemo.com.au.

that are approved by the Australian Energy Regulator (AER). The AER also approves the final DLF calculation.

Unaccounted for technical losses are the difference between the estimated losses calculated with DLFs and the actual losses that occur in the distribution network.

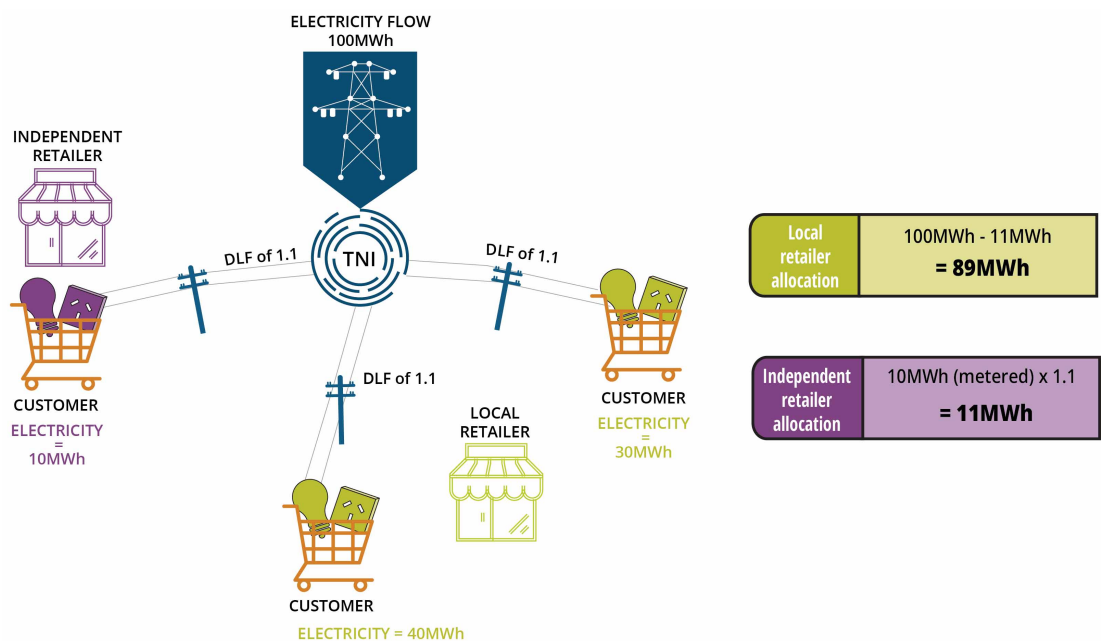
Commercial losses mainly consist of unaccounted for unmetered connections, electricity theft, inaccurate metering equipment (including due to a malfunction) and errors in accounting and record-keeping.

Estimation errors associated with profiling accumulation metering. Energy usage data from accumulation meters cannot be used in its raw form for wholesale settlement purposes. This is because the market is settled on 30 minute trading intervals (and from July 2021, five minute trading intervals) whereas an accumulation meter reading is a single reading relating to several months of usage. To estimate accumulation metering energy volumes for settlement, AEMO calculates and applies the net system load profile (NSLP) for each trading interval. The difference between the estimated volumes and actual volumes in each half hour are estimation errors.

Unaccounted for technical losses, commercial losses and estimation errors associated with accumulation meter profiling are collectively **unaccounted for energy** (UFE). UFE can be a surplus or a deficit.

Figure 1.1 provides a simplified example of settlement by difference. It shows two retailers serving customers from a transmission node identifier (TNI) within a local area - the local retailer and an independent retailer. The independent retailer is invoiced on the basis of the electricity metered at its customers' connection points, adjusted by the relevant distribution loss factor (DLF, an estimation of technical losses). The local retailer is invoiced on the amount of electricity that was measured at the TNI minus the electricity invoiced to the independent retailer.

Figure 1.1: Simplified example of settlement by difference



Source: Adapted from AEMO, High level design, p. 6.

In reality the settlement equation is more complex. This is because the number of independent retailers in a local area and the DLF values vary. Settlement calculations also need to account for:

- Type 7 metering installations, such as street lights. The type 7 category is used to determine the consumption of loads where it is not practical or economic to meter on a connection by connection basis, but whose energy consumption can be calculated to a reasonable level of accuracy using an algorithm. Type 7 loads are contestable and therefore can be served by local or independent retailers. The electricity associated with type 7 loads are captured in AEMO's Market Settlement and Transfer Solution (MSATS) database and are included in the wholesale market settlement process.
- Unmetered loads, including traffic lights (in some jurisdictions), bus shelter and telecommunications equipment. It is also not practical or economic to install a meter for these loads. These loads are not contestable and are the financial responsibility of the local retailer. Unmetered loads form part of UFE at settlement so local retailers pay for them but can recover their costs through off-market agreements with customers. In many cases, the local retailer will have an off-market agreement with a local council or other relevant party for unmetered loads. The agreement would be based on an estimation of the electricity consumption of the applicable unmetered loads.

Table 1.1 shows how different categories of electricity are allocated among the local retailer and independent retailers under settlement by difference.

Table 1.1: Allocation of electricity to retailers under settlement by difference

COST CATEGORY	PAID BY LOCAL RETAILER?	PAID BY INDEPENDENT RETAILER?
Metered electricity	Yes	Yes
Calculated technical losses (DLF applied to metered electricity)	Yes	Yes
Type 7 metering installation	Yes	Yes
Unmetered loads	Yes	No
Unaccounted for technical losses (part of UFE)	Yes	No
Commercial losses (part of UFE)	Yes	No
NSLP estimation error (part of UFE)	Yes	No

1.2.2

Electricity distribution and the settlement process

Governments in participating jurisdictions are responsible under jurisdictional electricity legislation for:

- allocating 'local areas' to a Distribution Network Service Provider (DNSP)³
- appointing a local retailer (referred to in the National Energy Retail Law (NERL) as a 'local area retailer') for each local area.⁴

Within a local area, there are metered connection points linking the transmission network and the distribution network, as outlines in Figure 1.2.⁵ A TNI is a code for the metering installation at the point where energy is supplied to the distribution network from the transmission substation. There are also National Metering Identifier (NMI) codes for each metering installation measuring the energy at a customer's connection to the distribution network. In general, each NMI is assigned to the TNI corresponding to the physical transmission connection point supplying the customer. Using Figure 1.2 below as an example, NMI₁ to NMI₆ would generally be assigned to TNI₁.

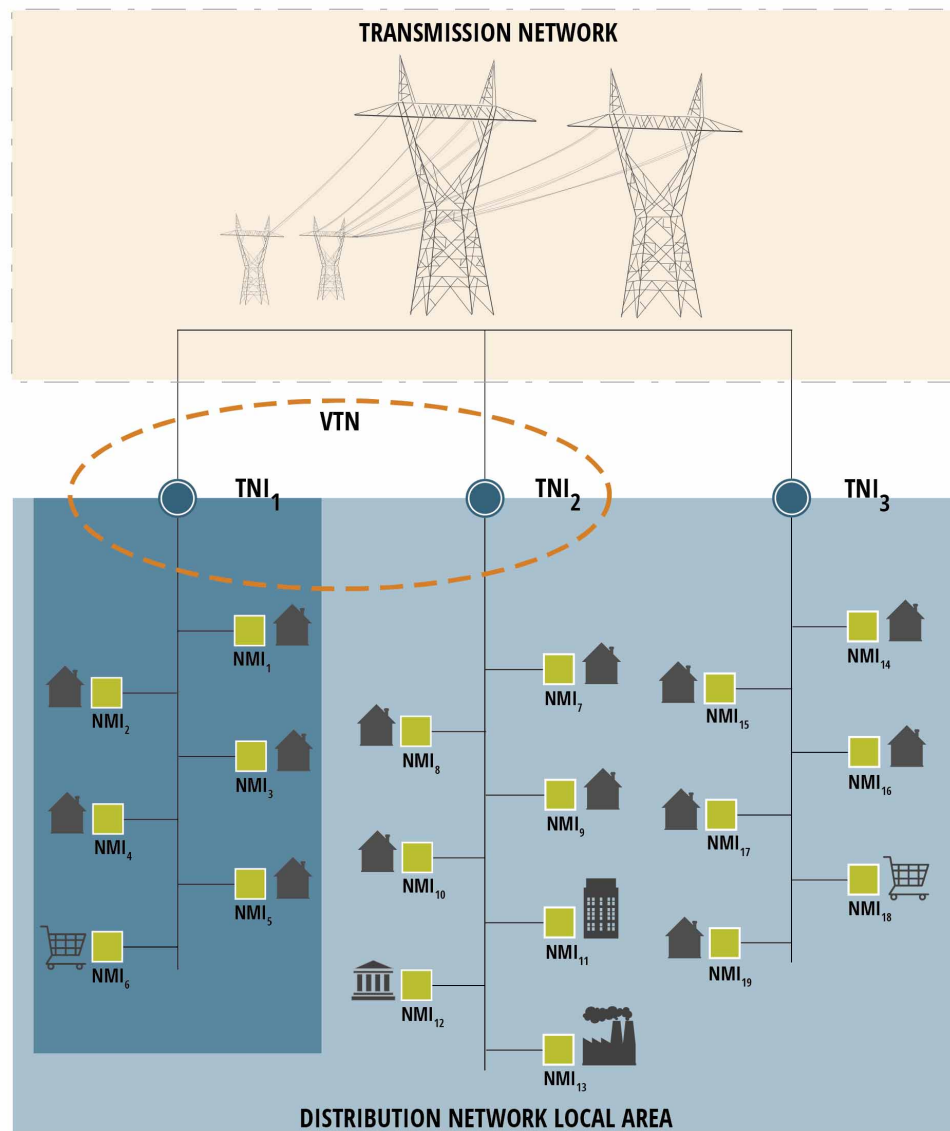
Alternatively, a number of adjacent transmission node connection points used to supply a single distribution network local area can, with the approval of the AER, be aggregated to form a virtual transmission node (VTN). Where this has occurred, individual customer NMIs can be assigned to either a TNI or a VTN. Again using Figure 1.2 as an example, NMI₁ to NMI₆ could either be assigned to TNI₁ or the VTN.

³ A local area is defined in NER, Chapter 10 as "the geographical area allocated to a Network Service Provider by the authority responsible for administering the jurisdictional electricity legislation in the relevant participating jurisdiction.

⁴ NERL, s. 11.

⁵ TNIs apply to every connection to a transmission network, including for example large generating systems and smelters. However, only TNIs associated with distribution networks are relevant to the proposed rule change.

Figure 1.2: Transmission and distribution network connection points



1.2.3

Industry data flows for settlement

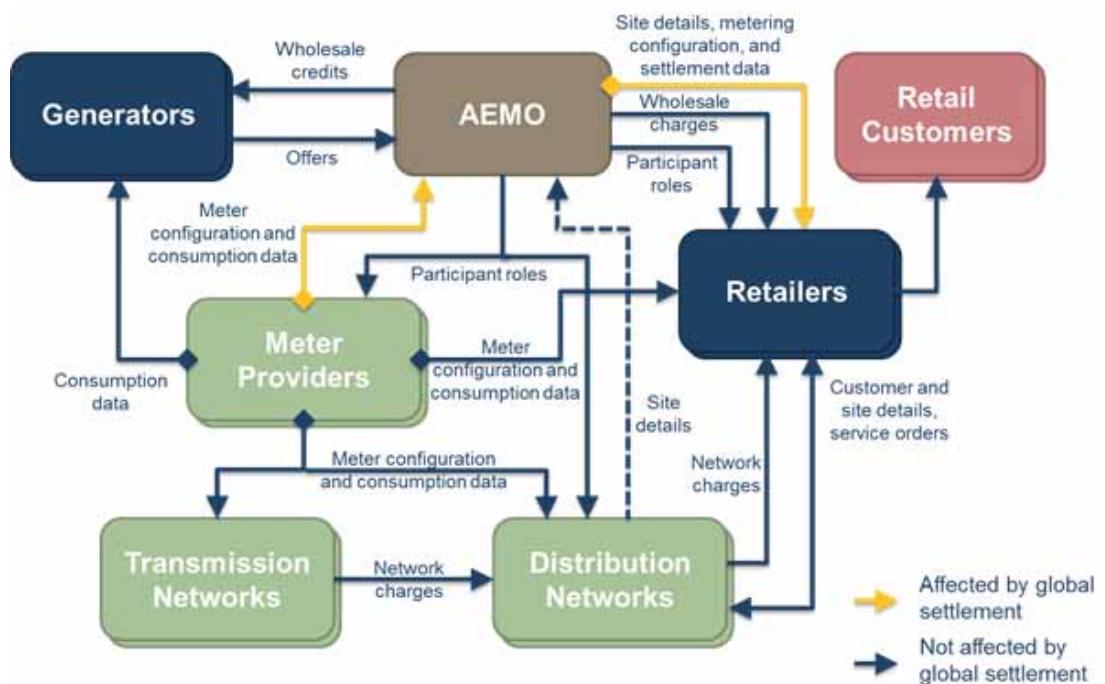
Settlement processes are dependent on metering data. Table 1.2 shows the data flows that underpin the current process of settlement by difference.

Table 1.2: Industry data flows under settlement by difference

MARKET ENTITY	DATA FLOWS IN RELATION TO EACH TNI
Metering data providers (MDPs)	<p>MDPs sends metering data in a rich data format (known as the Meter Data File Format (MDFF)) to:</p> <ul style="list-style-type: none"> financially responsible market participants (FRMPs, including local retailers, independent retailers, generators) relevant DNSP. <p>MDPs send metering data in a simplified data format (known as the Meter Data Management (MDM) file format) to AEMO.</p>
Local retailer	<p>Receives from MDP:</p> <ul style="list-style-type: none"> metering data for connection points where the local retailer is the FRMP, i.e. metering data relating to its customers, and metering between a transmission network and distribution network for which they are the local retailer metering data for connection points where the local retailer is not the FRMP, i.e. metering data relating to all other customers assigned to the TNI for the purpose of settlement statement reconciliation.
Independent retailers	<p>Receives from MDP:</p> <ul style="list-style-type: none"> metering data for connection points where the independent retailer is the FRMP, i.e. metering data relating to its customers.
AEMO	<p>Receives from MDP:</p> <ul style="list-style-type: none"> metering data relating to independent retailers' customers metering data for connection points between a transmission network and a distribution network generation data relating to generator supply and embedded generation. <p>Does not always receive consumption data relating to the connection points where the local retailer is the FRMP, although this is not prohibited in the National Electricity Rules (rules).</p>
DNSPs	<p>Receives from MDP:</p> <ul style="list-style-type: none"> metering data for all connection points on its distribution network.
Generators	<p>Receives from MDP:</p> <ul style="list-style-type: none"> metering data for connection points where the generator is the FRMP.

Figure 1.3 depicts the high-level data flows required by market participants for settlement. It also shows the data flows that would be affected by a change to global settlement from settlement by difference.

Figure 1.3: Data flows in the national electricity market



Source: AEMO, High level design, p. 13.

1.3 Rationale for the rule change request

In its rule change request, AEMO provides its rationale for the rule change. A number of key points raised in the rule change request are summarised below.

1.3.1 Allocation of UFE

AEMO notes that under settlement by difference, local retailers are fully exposed to commercial losses and to errors in the calculated technical losses.⁶ That is, the local retailer for each local area bears the cost and risk of all the UFE but it is unable to manage these costs, except for its own commercial losses. Consequently, UFE costs are passed through to the local retailer's customers, not to all customers in the local area. This makes retail electricity prices less efficient because they are not cost-reflective of customers' consumption or use of the network. It also means that retailers are not trading on the same terms in the NEM. According to AEMO, the current allocation of UFE to local retailers means there is no

6 AEMO, Rule change request, p. 5.

incentive for independent retailers to reduce commercial losses and metering inaccuracies because:

- independent retailers are only charged for loss-adjusted metered electricity, not UFE
- local retailers cannot identify or resolve these losses except in respect of their own customers.⁷

1.3.2 Wholesale market reconciliation

Under settlement by difference, AEMO considers that it is unable to perform full settlement reconciliation because it only receives TNI supply data and consumption metering data relating to independent retailers' customers. AEMO would also need consumption metering data relating to local retailers' customers to fully reconcile the market.

AEMO claims that being unable to fully reconcile settlement means that errors and anomalies in settlement are not easily identified. This means settlement errors may be continued outside of the six month window within which market participants must raise billing disputes with AEMO.⁸ AEMO notes that this has resulted in disputes that have required resolution outside the NEM settlement process.⁹

1.3.3 Data access

AEMO notes that access to metering data is different for local retailers and independent retailers. Independent retailers receive metering data for their own customers within a local area. However, local retailers are able to access all metering data in their local area for the purpose of settlement statement reconciliation.¹⁰ AEMO considers that there should be 'transparency for all retailers in the allocation of energy values for settlement in the NEM'.¹¹

1.4 Solution proposed in the rule change request

The rule change request from AEMO proposes that a global settlement framework be implemented to address the identified issues with settlement by difference. According to AEMO, there is an increasing need to implement global settlement now that independent retailers hold a significant market share.¹² As with the current settlement framework, global settlement would apply to the market customer (demand) side of the market and not the generator (supply) side.

Compared with settlement by difference where the local retailer pays for all UFE, global settlement would share UFE across all retailers. Retailers would still be responsible for their own customers' electricity consumption.

At a high level, AEMO's proposed global settlement methodology requires:

⁷ AEMO, Rule change request, p. 5.

⁸ NER, clause 3.15.18(b).

⁹ AEMO, Rule change request, p. 5.

¹⁰ AEMO, Rule change request, p. 5.

¹¹ AEMO, Rule change request, p. 7.

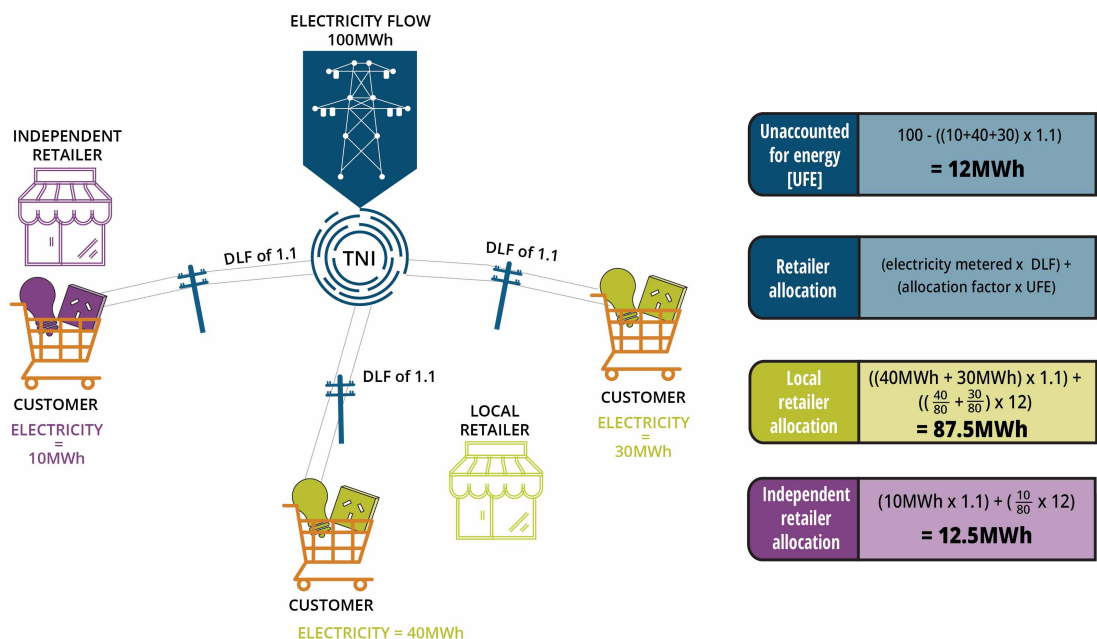
¹² AEMO, Rule change request, p. 7.

- measurement of total electricity supplied from the transmission system at the TNI and embedded generation (same measurement as for settlement by difference)
- measurement of total electricity consumed by the metered loads referenced to that TNI, adjusted by the relevant DLF (same measurement as for settlement by difference)
- calculation of the UFE amount by subtracting the total electricity consumed from the total electricity supplied (new calculation)
- allocation of UFE to all of the retailers operating at the TNI based on a pre-determined set of criteria
- AEMO propose that UFE is allocated based on each retailer's proportion of total energy consumption (new calculation)
- calculation of each retailer's settlement amount as the sum of its loss-adjusted energy consumption and share of UFE (new calculation).

Under AEMO's proposal for global settlement, the UFE would be calculated and allocated within each TNI. Using the dark blue area in Figure 1.2 in section 1.2.2 above as an example, the UFE for TNI₁ would be calculated by subtracting the energy metered at NMI₁ to NMI₆, adjusted for distribution losses, from the metered energy at TNI₁. The resulting UFE for TNI₁ would be recovered from the retailers associated with NMI₁ to NMI₆.

Figure 1.4 below is a simplified example of global settlement. It shows two retailers serving customers from a TNI within a local area - the local retailer and an independent retailer. Both retailers are invoiced on the basis of the electricity metered at their customers' connection points, adjusted by the relevant DLF, plus their share of UFE.

Figure 1.4: Simplified example of global settlements



Source: Adapted from AEMO, High level design, p. 10.

The global settlement calculation would be subject to similar complexities as settlement by difference, such as the number of retailers serving a TNI, variation in DLFs and treatment of calculated loads and unmetered declared loads.

1.5 Relevant background

This section provides an overview of how the structure of the electricity industry has evolved and current reforms.

1.5.1 Electricity industry structure

Prior to 1991, the electricity industry was under full government ownership and consumers paid regulated prices. Typically, generation and transmission were vertically integrated, and in some states distribution and retail were owned by local government.¹³ Given the overall importance of energy as an input into the wider economy, a more competitive electricity sector was viewed as crucial for improving economic growth and employment opportunities in the economy.¹⁴

¹³ KPMG, *National Electricity Market - A case study in successful microeconomic reform*, 2013, p. 14. Available at www.aemc.gov.au. For example in New South Wales, the Sydney County Council acted as the electricity supply business for most of Sydney until 1991 - see Wilkenfeld, G and Spearritt, P, *Electrifying Sydney - 100 Years of EnergyAustralia*, Sydney, 2004, p. 8.

¹⁴ AEMC, *2017 Retail Energy Competition Review*, p. 38.

Government reforms during the 1990s structurally separated the electricity supply industry into competing generators and retailers, and monopoly transmission and distribution network service providers. Transmission, generation, distribution and retail arms were either corporatised or privatised.¹⁵ This was in preparation for:

- the introduction of a uniform single wholesale electricity market across eastern and southern Australia
- customer choice in electricity supplier, initially for large customers (the first step in the transition to full retail contestability and the deregulation of retail pricing).¹⁶

Following these reforms and a staged transition, the NEM commenced in December 1998.¹⁷ At this time, retail competition was only available to large electricity customers. Small customers were exclusively served by their incumbent 'local retailer'—the retailer appointed to supply all customers in a distribution network (also called a 'local area'). Jurisdictional regulations prohibited new firms from entering the retail market.¹⁸

Retail energy markets began to change in 2002 when Victoria and New South Wales introduced full retail contestability in both their electricity and gas retail markets. Following these developments, other NEM jurisdictions opened up their retail energy markets to competition.¹⁹ The introduction of full retail contestability and then, in most jurisdictions, retail price deregulation has led to the emergence of independent retailers that compete with the local retailers.²⁰ Independent retailers include the new-entrant Tier 2 retailers and also the large incumbent retailers that were able to expand operations into other areas.

Figure 1.5 shows the proportion of small customers in each NEM region that, as at April 2018, were served by a local retailer as compared to those with an independent retailer. In the more populous states, more than half of small customers are served by independent retailers.

15 KPMG, *op. cit.*, p. 13.

16 *Ibid.*, p. 9

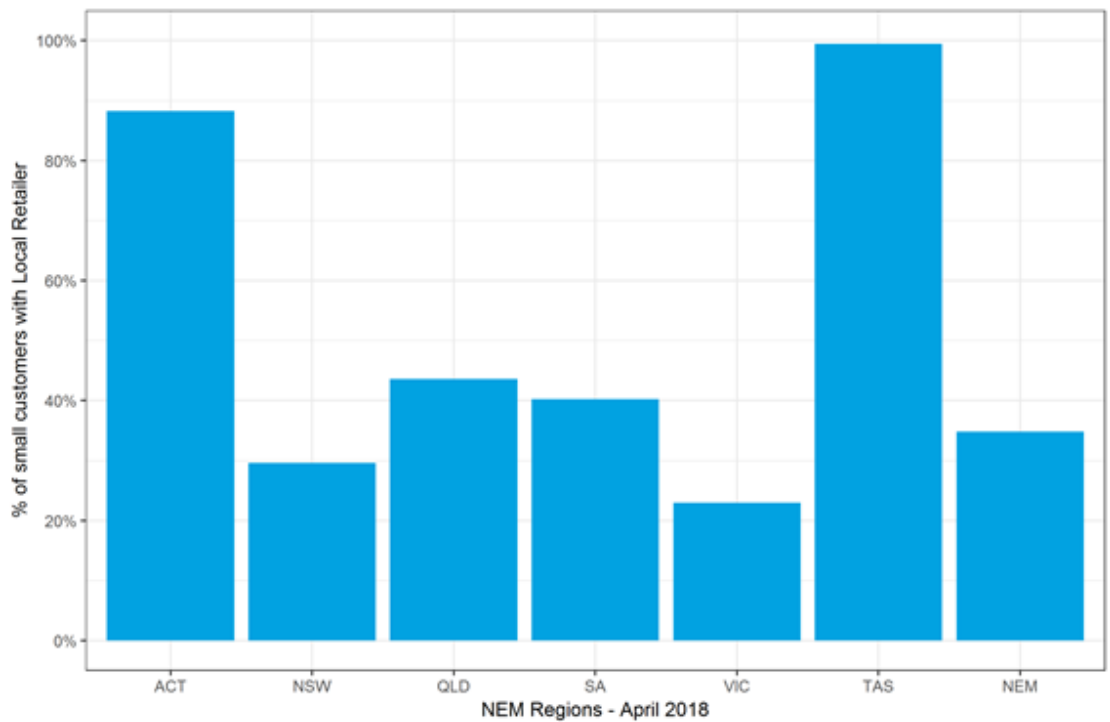
17 *Ibid.*, p. 32.

18 AEMC, *2017 Retail Energy Competition Review*, p. 12.

19 *Ibid.*

20 AEMC, *2017 Retail Energy Competition Review*, p. 130.

Figure 1.5: Proportion of small customers with the local retailer in each NEM region (April 2018)



Source: MSATS M71 Market Data

1.5.2

Energy sector transition

The NEM is currently undergoing a significant transition involving the adoption of generation technologies such as wind, solar and energy storage at the same time as the retirement of existing thermal generation. Work underway to manage the transition includes:

- setting the foundations for a competitive distribution market that would enable consumers to get the most value out of their rooftop solar panels, batteries and other distributed energy resources in the future²¹
- developing market frameworks which allow continued take-up of new generating technologies while keeping the lights on.²²

Major reforms in place that support the transition include competition in metering and five minute settlement. The competition in metering reform would also support global settlement. In addition, there is an opportunity to develop the IT system capability for global settlement

²¹ See: AEMC, *Distribution market model*, August 2017 and AEMC, *Electricity Network Economic Regulatory Framework Review*, July 2017.

²² See: www.aemc.gov.au/our-work/our-current-major-projects/system-security-and-reliability

in alignment with the design and build activities required for the introduction of five minute settlement.

Competition in metering

As part of the reforms that emerged from the *Power of choice review*, the AEMC recommended that all future new meters installed should be advanced (or 'smart') meters.²³ These meters are remotely-read and able to measure both how much electricity is used and when it is used, in near real time. On 26 November 2015 the AEMC made the *National Electricity Amendment (Expanding Competition in Metering and Related Services)* rule.²⁴ From 1 December 2017, this rule has required retailers to deploy advanced meters for small customers where new and replacement meters are required or where consumers are seeking access to advanced metering services.²⁵ Advanced meters provide consumers with greater opportunities to access new products and services to help them manage their electricity bills.

Another benefit of advanced meters is that settlement data becomes more accurate as the advanced meter fleet grows and the accumulation meter fleet retires. Since the start of competition in metering, more than 81,000 advanced meters have been installed at small customer connection points in the NEM (excluding Victoria), bringing the total number of small customer advanced meters to greater than 438,000.²⁶ This is in addition to the 2.8 million interval meters that were installed as part of the Victorian smart meter roll out. Advanced meters are now installed at 37 per cent of both small and large customer connection points across the NEM.²⁷

Five minute settlement

On 28 November 2017 the AEMC made the *National Electricity Amendment (Five minute settlement rule) 2017* to align operational dispatch and financial settlement of the supply side of the wholesale electricity market at five minutes.²⁸ Market participants and AEMO are preparing for five minute settlement which will commence on 1 July 2021. Implementation of five minute settlement requires AEMO to update its systems and procedures, and NEM participants to:

- review and where necessary update existing contract terms and conditions
- upgrade metering to provide five minute granularity data (where required)²⁹
- upgrade IT systems to store and process five minute granularity data.

23 For more information on the Power of choice reforms see: <https://www.aemc.gov.au/our-work/our-current-major-projects/power-choice>

24 The Expanding Competition in Metering and Related Services final rule and determination can be viewed at: <https://www.aemc.gov.au/rule-changes/expanding-competition-in-metering-and-related-serv>

25 Large customers already need to have remotely-read metering installations.

26 Data supplied by AEMO for the period 1 December 2017 to 1 May 2018.

27 Ibid

28 The Five minute settlement final rule and determination can be viewed at: <https://www.aemc.gov.au/rule-changes/five-minute-settlement>.

29 Meters that are not communication enabled (which make up the majority of small customer meters outside of Victoria) currently have their consumption manually checked every few months. Where necessary, AEMO currently profiles this consumption for a 30 minute period. This profile will be changed to a five minute period, without the meter needing to be replaced for five minute settlement.

1.5.3

Estimates of unaccounted for energy

Under the current settlement framework, AEMO is unable to perform a full reconciliation of all energy being settled because it does not always receive metering data relating to local retailers' customers. Therefore, it cannot estimate UFE in each local area or across the NEM. In the rule change request, AEMO highlighted information provided to it from the New Zealand Electricity Authority, which indicated that since a global settlement framework was adopted for the New Zealand electricity market in 2008, UFE has reduced to 0.8 per cent of total energy settled per annum. The New Zealand experience is described in Box 2.³⁰ UFE was not measured in New Zealand prior to the introduction of global settlement.

The AEMC has attempted to gather information about the size of UFE in Australia. Cost estimates for distribution areas ranged from \$0.003 to \$0.30 per MWh of generation. As a proportion of generation, UFE estimates range from 0.003 to 1.1 per cent. Note that these estimates are themselves based on approximations and therefore should be used cautiously.

The World Bank tracks annual 'electric transmission and distribution losses' as a percentage of generation output for most countries.³¹ Transmission and distribution losses are defined as 'losses in transmission between sources of supply and points of distribution and in the distribution to consumers, including pilferage'.³² This definition is broader than that of UFE (comprising commercial losses and unaccounted for technical losses) because it also includes technical losses. Therefore the level of the international data on electricity losses is only a guide to the level of UFE for those countries as the UFE will be less.

The data are collected from national energy agencies by the International Energy Agency (IEA), adjusted by the IEA to meet international definitions and published by the World Bank. The data set currently spans the period 1960 to 2014. It shows that in 2014 the world average for losses was 8.3 per cent of wholesale market volume and the reported result for Australia was 4.8 per cent. The 2014 results for countries with electricity markets broadly comparable to Australia's were:

- New Zealand, 6.5 per cent
- United Kingdom, 8.3 per cent
- Ireland, 7.9 per cent.

BOX 2: IMPLEMENTATION OF GLOBAL RECONCILIATION IN NEW ZEALAND

In the period 2001 to 2004, retailers estimated that UFE in the New Zealand electricity market was in the order of NZD \$10 million to \$30 million per month. These costs were being shouldered by incumbent retailers under the settlement by difference regime. This drove the industry to collaborate on a design for 'global reconciliation' (similar to AEMO's proposed design for global settlement in the NEM).

³⁰ AEMO, Rule change request, p. 9.

³¹ World Bank website at <https://i646174610776f726c6462616e6b06f7267z.oszar.com/indicator/EG.ELC.LOSS.ZS>, viewed 24 May 2018.

³² Ibid

The rule change took 18 months and tendering for the settlement system took another year. Global reconciliation began on 1 May 2008 although some parts of the market are still settled by difference due to the configuration of certain networks.

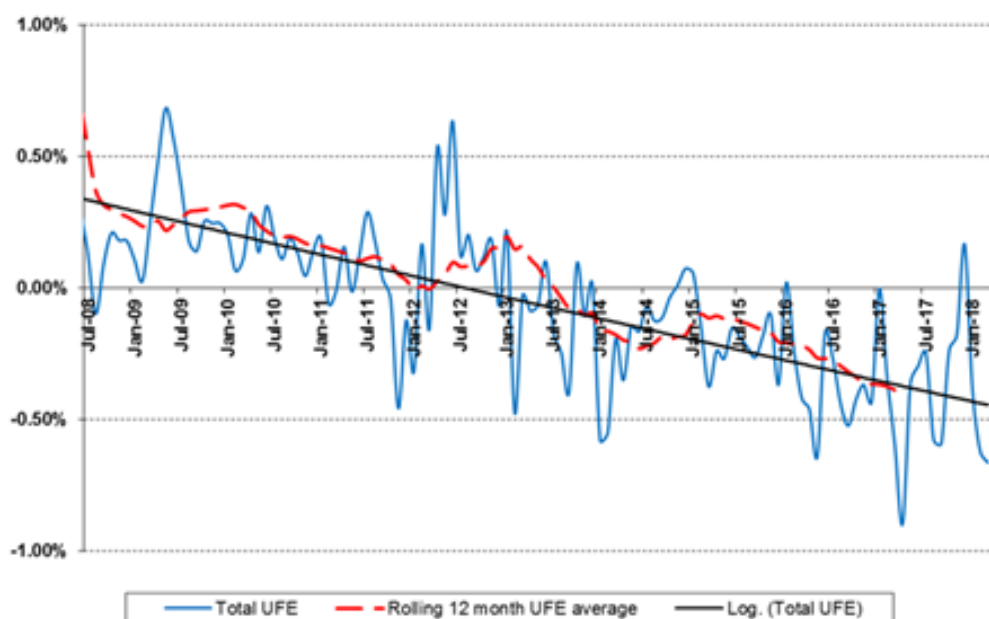
The New Zealand Electricity Authority began measuring UFE from the start of global reconciliation, and note that it has decreased over time. This is largely related to:

- revision of some DLFs
- more accurate settlement data as a result of the advanced metering infrastructure rollout. About 78% of meters are now interval meters, with some networks having 90% penetration while others are around 45-50%
- better data handling practices.

Figure 1.6 below shows:

- the absolute change in UFE as a proportion of total market load over time
- the rolling 12 month average change in UFE
- the decreasing trend in UFE.

This data is calculated for grid connected local networks that are reconciled using the global reconciliation methodology. Secondary networks are not included. It is also subject to wash-ups that may cause minor variations up to 14 months into history from the current time.



Source: New Zealand Electricity Authority

1.6 The rule making process

On 7 June 2018, the Commission published a notice advising of its commencement of the rule making process and consultation in respect of the rule change request. A consultation paper identifying specific issues for consultation was also published. Submissions to the consultation paper closed on 5 July 2018. The Commission received 18 submissions as part of the first round of consultation.

On 30 August 2018, the Commission published a draft rule determination and a draft rule. Submissions on the draft rule determination closed on 25 October 2018. The Commission received 15 submissions on the draft rule determination. In making this final rule determination, and accompanying final rule, the Commission has considered all issues raised by stakeholders in the first and second consultation rounds. Issues raised in submissions are discussed and responded to throughout this final rule determination. Issues that are not addressed in the body of this document are set out and addressed in Appendix A.

2 FINAL RULE DETERMINATION

2.1 The Commission's final rule determination

The Commission's final rule determination is to make a final rule which is a more preferable final rule. The final rule introduces a global settlement framework for settlement of the demand side of the wholesale electricity market. The final rule also provides for a transition period to implement the changes necessary to introduce global settlement.

The Commission's reasons for making this final rule determination are set out in section 2.4 below.

This chapter outlines:

- the rule making test for changes to the NER
- the assessment framework for considering the rule change request
- the Commission's consideration of the more preferable final rule against the national electricity objective
- the key features of the final rule.

Further information on the legal requirements for making this final rule determination is set out in Appendix B.

2.2 Rule making test

2.2.1 Achieving the NEO

Under the NEL the Commission may only make a rule if it is satisfied that the rule will, or is likely to, contribute to the achievement of the national electricity objective (NEO).³³ This is the decision making framework that the Commission must apply.

The NEO is:³⁴

to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:

- (a) price, quality, safety, reliability and security of supply of electricity; and
- (b) the reliability, safety and security of the national electricity system.

2.2.2 Making a more preferable rule

Under s. 91A of the NEL, the Commission may make a rule that is different (including materially different) to a proposed rule (a more preferable rule) if it is satisfied that, having regard to the issue or issues raised in the rule change request, the more preferable rule will or is likely to better contribute to the achievement of the NEO.

In this instance, having regard to the issues raised in the rule change request and during consultation, the Commission is satisfied that the final rule will, or is likely to better

³³ Section 88 of the NEL.

³⁴ Section 7 of the NEL.

contribute to the achievement of the NEO and has therefore made a more preferable rule. The reasons are summarised in section 2.4 below.

2.3 Assessment framework

In assessing the rule change request against the NEO the Commission has considered the following principles:

- **Prices that reflect the cost of supply and value of its use** - the extent to which the proposed changes would improve the accuracy of the settlement outcomes, and whether this is likely to promote more efficient use of electricity services. To promote efficient outcomes in the electricity market, retail charges should accurately reflect the quantity of electricity consumed and prices should not include inefficient cross-subsidies. An increased ability for AEMO to reconcile settlement errors, and increased incentives on retailers to identify sources of commercial losses, are likely to improve the accuracy of the settlement outcomes.
- **Price and quantity risk allocation** - the potential of the proposed rule to provide more efficient risk allocation and greater incentives to identify sources of commercial losses. Risks should be allocated to the parties who have incentives and ability to efficiently manage them. Metering errors and unidentified sources of commercial losses lead to UFE within a distribution network. Currently these risks are allocated to the local retailer who is generally unable to manage these risks.
- **Regulatory and administrative burden** - the effect on market participants' regulatory and administrative burden that may arise if the proposed rule were to be implemented. Through this rule change process, the Commission seeks to understand the magnitude and distribution of the costs. The costs associated with the proposed changes would involve once-off costs to transition, as well as on-going costs associated with the new framework.

2.4 Summary of reasons

The more preferable final rule made by the Commission is attached to and published with this final rule determination. The key features of the more preferable final rule are:

Unaccounted for energy

- Provides for the calculation of UFE for each local area.
- Provides for the UFE calculated for each local area to be allocated across all market customers in that local area based on their 'accounted-for' energy.
- Introduces a requirement for AEMO to publish information to enable Market Customers to verify the UFE amounts allocated to their market connection points for each trading interval in accordance with a procedure to be developed by AEMO.
- Introduces a requirement for AEMO to publish on its website at least once each year, a report setting out AEMO's summary and analysis of UFE in each local area over the reporting period against benchmarks determined by AEMO. The report must also include: AEMO's analysis of the sources of UFE in each local area; its recommendations to

improve visibility of UFE in each local area; and its recommended actions to reduce the amounts of UFE in each local area, including any actions AEMO recommends be taken by AEMO, the AER, Market Participants or Network Service Providers. The final rule also includes a requirement for parties to provide such information and assistance as AEMO reasonably requires in order to prepare its report. The final rule also sets out that the purpose of the report is for AEMO to provide information and analysis of UFE in each local area to facilitate efficient decreases in UFE over time.

- Introduces a requirement for AEMO to prepare and publish guidelines that set out AEMO's approach to preparing and publishing the report referred to above and how the purpose of the report will be achieved.
- Introduces a requirement that only the local transmission network service provider may be appointed as metering coordinator in relation to a transmission connection point that is not a market connection point. As this is a regulatory obligation on the TNSP under the NER, this service would be a prescribed transmission service.
- Introduces a requirement that a metering coordinator may only be appointed with respect to a connection point that connects adjacent distribution networks by agreement between the two DNSPs related to that connection point

Billing for distribution services

- Provides that charges for distribution services based on metered energy for first tier customers and non-registered customers must be calculated by a DNSP from settlements ready data obtained from AEMO's metering database for customers with types 1-3 metering installations, and from either metering data in accordance with the Metrology Procedures or settlements ready data for customers with types 4, 4A, 5, 6 or 7 metering installations. The draft rule also removes the ability for a DNSP to bill a local retailer for distribution services used by non-registered customers.

Virtual transmission nodes

- Retains virtual transmission nodes (VTN) for the purposes of settlement.

Unmetered loads

- Requires AEMO to include in its metrology procedures guidance for the inclusion of non-market unmetered load in settlement including: the creation of NMIs for non-market unmetered load; the assignment of connection points relating to non-market unmetered load to a single TNI or VTN; the provision of data on the estimated consumption of non-market unmetered load to AEMO, and the methodology for calculating load and a load profile for non-market unmetered load.
- Requires the LNSP to be appointed the metering coordinator for non-market unmetered loads.

Non-market generators

- Amends clause 2.2.5(a) from the commencement date of the rule, so that only a generating unit whose entire output is consumed by market load at the same connection point must be classified as a non-market generating unit. A generating unit that wants to

sell its output to a market customer must become a registered participant, or operate via an intermediary who is a registered participant.

Transitional rules

- Retains the existing arrangements under clause 2.2.5(a) for those non-market generators whose output is currently purchased entirely by the local retailer, and provides that the local retailer will be the financially responsible market participant (FRMP) in relation to the connection point to which the non-market generator is connected.
- Introduces a requirement on AEMO to amend and publish its relevant procedures to take into account the final rule by 1 December 2019. Including, for avoidance of doubt, to update the relevant procedures to oblige metering data providers (MDPs) to provide it with all metering data for first tier load.
- Introduces an obligation on AEMO to calculate and publish information on UFE volumes in accordance with the new rules from 1 July 2021.

In order to implement global settlement, AEMO must also make a number of changes to its procedures, including the metrology procedures and the MSATS. Much of the detail of NEM settlements and the provision of metering data for settlements purposes is set out in these procedures rather than the National Electricity Rules. The Commission therefore expects that AEMO will amend its procedures to implement global settlement, including by requiring MDPs to provide it with metering data for all first tier load. The final rule therefore requires AEMO to amend its relevant procedures to take into account the amending rule.

Having regard to the issues raised in the rule change request and during consultation, the Commission is satisfied that the final rule will, or is likely to, contribute to the achievement of the NEO for the following reasons:

- It is a more advanced settlement system which will improve the transparency and accuracy of the settlements process. Under global settlement, AEMO will have the metering data for the customers of all retailers, allowing it to fully reconcile energy within each distribution network. This will provide for timelier and more frequent identification of settlement errors, which will reduce the costs of resolving settlement disputes outside of the regular settlement process. These costs are currently substantial for the businesses involved.
- It will provide for more effective retail competition in the long run because costs and risks will be allocated in a manner which does not distort competition. Retailers will more appropriately incur the costs that they cause, providing for more cost-reflective prices across industry and subsequent improvements in allocative efficiency.
- Risk allocation will be improved, providing enhanced incentives for retailers and other market customers to reduce UFE as doing so will result in reduced costs for them. This is likely to result in UFE being smaller than if this UFE allocation did not occur, with associated productive and allocative efficiency benefits.

The Commission is satisfied that the more preferable final rule will, or is likely to, better contribute to the achievement of the NEO than the proposed rule for the following reasons:

- UFE is allocated across all market customers in that local area based on their 'accounted-for' energy. This is different from AEMO's proposal in the rule change request, which proposed that UFE be allocated across all market customers at that TNI. In comparison, the Commission's final rule avoids potential cross-subsidies and localised distortions, without diluting components of UFE that could be specific to a particular network area. It also more harmoniously accommodates the continued use of VTNs.
- The final rule introduces an AEMO UFE reporting requirement. The framework will provide transparency of UFE across the NEM and facilitate efficient decreases in UFE over time through analysis and recommendations for methods of reducing UFE.
- The local retailer concept is retained in the rules. It is possible to implement global settlement without having to remove it. Retaining this concept, albeit for a reduced number of applications, simplifies the implementation of global settlement with respect to the treatment of non-type 7 unmetered loads.
- The option for VTN's to be used to average transmission network loss factors over an adjacent group of transmission network connection points is retained. The policy objectives of VTNs are separate to those of global settlements and there will still be situations under global settlements where using VTNs to average transmission loss factors will be an efficient course of action. The more preferable final rule allows for these practices to continue as they do now.
- The final rule specifies that the Local Network Service Provider (LNSP) be nominated as the metering coordinator for metering installations at points that connect a distribution network with a transmission network. The relevant LNSP for these metering installations is the Transmission Network Service Provider (TNSP). Currently, the local retailer for the associated distribution network is responsible for the metering. The rule change request did not specify a change to these arrangements. Under global settlement, local retailers have a reduced financial interest in the energy metered at each of these points, hence it is more appropriate for responsibility for the metering to be allocated directly to the TNSP. Having the TNSP as the metering coordinating is beneficial in comparison to the status quo as it would provide continuity in the provision of metering services, assisting with the implementation of five minute settlement.
- The final rule specifies that where there are flows between distribution networks, the relevant DNSPs jointly appoint a metering coordinator to meter these flows. The rule change request did not contemplate such flows between distribution network. Under settlement by difference, the Commission understands that respective local retailers settle these energy flows off-market, however under global settlement these flows need to be accounted for through MSATS, so they do not artificially change UFE levels. Having the relevant DNSPs jointly appoint a metering coordinator is beneficial in comparison to the status quo as it would ensure the UFE allocated to retailers is as accurate as possible. The final rule also provides that the relevant DNSP may be appointed as the metering coordinator for these types of connection points.

3 KEY FEATURES AND BENEFITS OF GLOBAL SETTLEMENT

This chapter discusses the issues identified in the rule change request and AEMO's proposal for global settlement in more detail. It sets out the Commission's consideration of the case for identifying UFE and allocating UFE to entities other than the local retailer of each local area. It concludes with an evaluation of the likelihood of the global settlement changes meeting the NEO.

3.1 Issue with the existing arrangements

Chapter 1 described the existing process of settlement by difference, which has been in place since the start of the NEM. The process of settlements by difference results in the local retailer for an area bearing the cost and risk of all residual electricity losses, including unaccounted for technical losses, other retailers' commercial losses and accumulation meter profiling errors. In the early days of the NEM, local retailers generally had very high proportions of market share, so this settlement process for the most part resulted in cost and risk being appropriately allocated.

Over time, the introduction of full retail contestability and then, in most jurisdictions, retail price deregulation has led to the emergence of independent retailers that compete with the local retailers. Across the NEM, more than half of small customers are now served by independent retailers, as opposed to local retailers (Figure 1.5 in Chapter 1). In some network regions, the market share of the local retailer is less than 15 per cent.

In this changing market dynamic, the Commission does not believe settlement by difference is still the most accurate and efficient settlement process for the NEM.

3.2 AEMO's initial proposal

In its rule change request, AEMO identified three issues with settlement by difference that would be remedied by moving to global settlements. These were also set out in section 1.3.

First, the local retailer for each *local area*³⁵ bears the cost and risk of all the UFE but it is unable to manage these costs, except for its own commercial losses. Consequently, UFE costs are passed through to the local retailer's customers, not to all customers in the local area. This makes retail electricity prices less efficient because they are relatively less cost-reflective of customers' consumption or use of the network.

AEMO submitted that the current allocation of UFE to local retailers means there is no incentive for independent retailers to reduce commercial losses and metering inaccuracies. Conversely, global settlement and the allocation of UFE to all retailers would provide an incentive for both local and independent retailers to reduce commercial losses and therefore costs to consumers.

³⁵ The term local area is defined in the NER as the geographical area allocated to a Network Service Provider by the authority responsible for administering the jurisdictional electricity legislation in the relevant participating jurisdiction.

Second, under settlement by difference, AEMO is unable to perform full settlement reconciliation because it only receives TNI supply data and consumption metering data relating to independent retailers' customers. AEMO considers that this means errors and anomalies in settlement can be difficult to identify. Settlement errors may continue beyond the six month window within which market participants must raise billing disputes with AEMO, resulting in subsequent legal proceedings between affected market participants that may be costly. AEMO considered that global settlement would allow for settlement anomalies to be more easily identified, reducing the likelihood of settlement errors needing dispute resolution or legal proceedings, with associated cost savings for market participants.

Third, AEMO noted that access to metering data is different for local retailers and independent retailers. Independent retailers receive metering data for their own customers, whereas local retailers are able to access all metering data in their local area for the purpose of settlement statement reconciliation. AEMO considered that global settlements would be more equitable in this respect as all retailers would only have access to the metering data of their own customers.

Regarding costs, AEMO considered that the only material cost of the change would be in AEMO making changes to market systems and data formats. It considers that the implementation cost would be moderate and only incremental to the five minute settlement implementation costs, assuming that the IT system capability for global settlement was developed in alignment with the design and build activities for five minute settlement. In subsequent correspondence with Commission staff, AEMO estimated that implementing global settlement for its own systems would cost less than \$5 million, if it is included in the five minute settlement implementation.

3.3 Submissions to the consultation paper

In submissions on the consultation paper, there was close to universal in-principle support for a global settlement framework. It was widely viewed as a change that would 'level the playing field'.³⁶

Stakeholders generally agreed that there would be benefits from AEMO being able to undertake a full reconciliation of the wholesale market, but some questioned whether all of AEMO's proposed changes are necessary for AEMO to be able to do this. Flow Power and Red Energy/Lumo Energy submitted that AEMO should seek to improve its own processes for settlement reconciliation before more substantial rule changes are considered.³⁷ Red Energy/Lumo Energy submitted that AEMO could amend its procedures to enable it to collect all the metering data it requires to perform a full reconciliation. Red Energy/Lumo Energy submitted that AEMO's current procedures require all type 1-4 metering installation data to be provided to AEMO by the MDP however for types 5 and 6 metering installations, only metering data from the customers of independent retailers is required to be provided. This could be amended by a change to AEMO's procedures. Red Energy/Lumo Energy also

³⁶ Consultation paper submissions: AGL Energy, p. i; Australian Energy Council, pp. 1-2; EnergyAustralia, pp. 1-2; Origin Energy, p. 1.

³⁷ Consultation paper submissions: Flow Power, p. 2; Red and Lumo, pp. 1-2.

considered that AEMO should calculate UFE to understand the impacts on competition before a rule change is undertaken.

There were differing views on whether a global settlement framework would provide improved incentives for market participants to reduce UFE. Broadly, stakeholders fell into two camps:

1. Global settlement would encourage all retailers to take responsibility for identifying and reducing sources of UFE. This was the position that AEMO presented in its rule change request. In its submission, AEMO explained that calculating UFE will likely highlight a number of material anomalies—such as the misallocation of NMIs to the correct TNI, poor estimation of technical loss factors, unresolved issues with VTNs,³⁸ and registration errors—allowing for them to be rectified.³⁹ A further benefit identified by AGL Energy was an improved ability for local retailers to balance their wholesale and retail positions, if UFE is allocated more widely.⁴⁰
2. Incentives to reduce UFE would be unchanged or reduced under global settlement. These stakeholders thought that spreading UFE more widely than local retailers could reduce incentives to reduce it, as the losses would become diluted and go unnoticed.⁴¹ In support of this view, ERM Power submitted that unmetered loads and net system load profile (NSLP) profiling errors are out of the control of independent retailers. It thought that DNSPs are instead best-placed to monitor losses.⁴² Red Energy/Lumo Energy questioned AEMO's claim that there is currently a lack of incentives on independent retailers. It noted that the rules already contain requirements for meters that have malfunctioned to be replaced.⁴³

Those opposed to the wider allocation of UFE thought that doing so may have a negative impact on retail competition by increasing costs for smaller independent retailers.⁴⁴

Momentum Energy observed that the benefits of incumbency and the economies of scale which exist within the retail energy market have long been recognised by policy makers. It submitted that additional imposts on challenger retailers should be minimised at this time, to avoid a return to significant retail market concentration.⁴⁵ Red Energy/Lumo Energy considered that AEMO's proposal is likely to reduce competition and increase barriers to entry in the retail market, as smaller independent retailers do not have the equivalent financial backing as local retailers. Energy Consumers Australia was of a similar view, submitting that independent retailers could be expected to pass on additional costs into their retail prices, and this could lead to an increase in the prices charged by all retailers.⁴⁶

38 Virtual transmission nodes, or VTNs, are a mechanism that allows for transmission network loss factors to be averaged over an adjacent group of transmission network connection points. The applications of VTNs and their treatment under global settlement are discussed in Chapter 5.

39 AEMO, consultation paper submission, p. 2.

40 AGL Energy, consultation paper submission, p. 7.

41 Consultation paper submissions: ERM Power, pp. 1-2; Flow Power, p. 1.

42 ERM Power, consultation paper submission, p. 2.

43 Red Energy and Lumo Energy, consultation paper submission, p. 3.

44 Consultation paper submissions: Energy Consumers Australia, p. 3; Flow Power, p.; Momentum, pp. 1-2; Red Energy and Lumo Energy, p. 2.

45 Momentum Energy, consultation paper submission, p. 2.

46 Energy Consumers Australia, consultation paper submission, p. 3.

In contrast, the Australian Energy Council argued that the inequitable treatment of different retailers harms the vibrancy of competition. It suggested that there would be a long-term benefit to consumers from addressing the inequitable treatment.⁴⁷

No comments were received on the issue of equitability of local retailers having access to independent retailers' metering data.

Little additional information was provided by submitters on the costs of making the change. AGL Energy and Origin Energy expressed an expectation that implementing global settlement would involve no significant costs to them above those associated with implementing five minute settlement.⁴⁸ In contrast, EnergyAustralia, Flow Power and ERM Power speculated that there could be significant costs involved in making the change.⁴⁹ Ausgrid estimated that it may cost in the order of \$500,000 for its MDP to implement the necessary changes.

A number of stakeholders requested that the Commission undertake further analysis to quantify the costs of the change, including the costs to be incurred by AEMO, however these stakeholders did not provide any information on the likely costs to themselves.⁵⁰

3.4 Analysis

In the draft determination, the Commission identified three broad benefits associated with implementing the move to global settlements, these include:

- increased transparency of UFE, leading to fewer settlement disputes
- improved risk allocation driving incentives
- competition on equal terms.

The first benefit identified relates to a policy decision on whether changes should be made to the current systems to collecting the required data and calculating UFE, so that AEMO and other parties become aware of UFE levels and potential causes. The second and third benefits relate to a policy decision on how UFE is allocated, and whether the allocation may appropriately incentivise reducing UFE. The following sections explore the potential costs and benefits of each decision. A final section provides an evaluation of the benefits of a move to global settlements against the National Electricity Objective.

3.5 Increased transparency

3.5.1 Analysis and position in the draft determination

Transparency from moving to global settlements

In the draft determination the Commission considered that there is likely to be material market-wide benefits from simply identifying UFE through AEMO undertaking a full reconciliation of the market. This would directly capture the proposed benefits flowing from errors and anomalies in settlement being identified more easily and, therefore, more quickly.

⁴⁷ Australian Energy Council, consultation paper submission, p. 2.

⁴⁸ AGL Energy, consultation paper submission, p. 7; Origin Energy, personal communication, 19 July 2018.

⁴⁹ Consultation paper submissions: EnergyAustralia, p. 2; Flow Power, p.2; ERM Power, p. 1.

⁵⁰ E.g. consultation paper submissions: EnergyAustralia; Red Energy and Lumo Energy.

AEMO identified potential benefits from avoiding off-market settlements, dispute resolution and legal proceedings stemming from such errors.

The Commission sought information on the likely savings from local retailers and AEMO and, based on the case studies and data provided, estimated that material savings are possible by AEMO undertaking full reconciliation of the market. In aggregate the Big 3 retailers (Origin Energy, AGL Energy and EnergyAustralia) described settlement disputes in the order of \$5 million in each year. The costs incurred by these businesses to recover the disputed amounts was estimated by the Commission, based on the information provided, to be in the order of \$1 million a year. It is understood that these costs, which are incomplete as other entities are also involved in the disputes, could largely be avoided by the identification of UFE. A reduction in transaction costs would be expected to improve the productive efficiency of the businesses that would have otherwise incurred these costs.

The additional data required by AEMO to undertake full reconciliation and calculate UFE is the metering data for the customers of the local retailer in each local area. The costs of the data being provided appear to be relatively minor. In its High Level Design, AEMO described two options by which it could receive the metering data for all connection points.⁵¹ These are described in Box 3 below. The first is an extension of the existing process. It would not require any change to the MSATS methodology, and changes to MDP processes and systems are expected by AEMO to be minimal. The second option would require changes to MSATS, however these changes are already required to implement five minute settlement.

BOX 3: DATA FILE FORMATS OPTIONS FOR GLOBAL SETTLEMENT

Under settlement by difference, as specified in AEMO's Metrology Procedures, MDPs provide metering data to the local retailer, LNSP and the energy retailer or generator at the connection point. It is in a rich data format, known as the Meter Data File Format (MDFF). AEMO, on the other hand, receives a simplified metering data file in an aggregated net format (known as the Meter Data Management file format (MDM)) for connection points for which the FRMP is an independent retailer. The difference between the MDFF and MDM is that the MDFF can contain a range of different energy values (e.g. peak and off-peak consumption, and peak and off-peak generation), whereas the MDM is a net figure (i.e. total consumption minus total generation).

AEMO's two options for it to receive the metering data for all connection points are:

1. AEMO to receive MDM files for all connection points. MDPs would be required to create and deliver MDM files for all connection points, including where the connection point is with the incumbent retailer. This would avoid AEMO having to change its MSATS methodology for receiving and processing metering data, but would require changes to MDP processes and systems.

⁵¹ AEMO, High level design, p. 14.

2. AEMO to use MDFF format instead of MDM format. MDPs would be required to include AEMO as an additional recipient of the MDFF and would no longer be required to create and deliver the MDM file. This would simplify the method of delivery of data for MDPs, and also remove the need for MDPs to create a separate MDM file to support the settlement process. AEMO's MSATS will have to be changed to allow for the receipt and processing of data delivered in the MDFF data format.

The Commission notes that any changes to data file formats could be implemented by AEMO, and would not require changes to the rules.

Transparency at the TNI level and actions to resolve UFE

AEMO proposed in its rule change request that UFE be calculated for each TNI. In the draft determination the Commission agreed that this appeared to be the appropriate level for this calculation since, as identified by AEMO, it would be consistent with the current settlement framework; it would provide for relatively less complicated system changes for AEMO and market participants.

The main complicating factor for calculating UFE at the TNI level is the use of VTNs. Calculating UFE at the TNI requires knowledge of which NMIs are connected to each TNI, since UFE is the difference between the energy metered at the TNI and aggregate of all the energy from NMIs that are assigned to it. Usually the 'mapping' of NMI-to-TNI is identified in MSATS standing data; LNSPs are required to provide the TNI for each NMI.⁵² However, where a NMI has been assigned to a VTN, it is the VTN that appears in MSATS instead of the physical TNI. As such, the use of VTNs may place a limit on the ability of AEMO to calculate UFE at the TNI level.

The Commission's position was that DNSPs using VTNs should provide the NMI-to-TNI mapping to AEMO for customers assigned to a VTN, and for AEMO to accommodate this extra data in MSATS. With this information, AEMO would still be able to undertake a full reconciliation and calculate UFE at the TNI level, despite the use of VTNs. This would allow for the potential benefits described above to be realised. This issue is covered in chapter 5.

A further consideration is the treatment of non-type 7 unmetered loads that currently do not enter AEMO's settlement systems. Under a global settlement framework it is necessary to account for the energy allocated to unmetered loads so that it can be factored into the calculation of UFE, otherwise it will itself be displayed as UFE. A process for this to occur is outlined in chapter 5. It involves a requirement for AEMO to include in its metrology procedures a process for unmetered loads to be allocated a NMI so that they can be processed through MSATS. They will need to be allocated a load profile, potentially a very simple one, and also allocated to a TNI (or VTN).

The Commission noted that in some cases it is likely that the mapping of NMIs-to-TNIs is likely to have higher costs than benefits. This was most likely to be the case within the

⁵² NER, clause 3.6.3.

TasNetworks area where TasNetworks had highlighted in its submission that the level of physical switching that occurred would make the mapping extremely costly. The draft rule provided an exemption framework to allow DNSPs to apply to AEMO to be exempt from the requirement.

Despite the identified improved incentives for retailers under global settlement, the Commission acknowledged that there are limits to what retailers can do to reduce UFE and there are also important roles for both DNSPs and AEMO. To facilitate a collaborative approach to reducing UFE, the draft rule introduced provisions for AEMO to conduct technical studies of UFE volumes at a TNI in instances where a high level of UFE is identified—an idea suggested by Origin Energy in its submission.⁵³

The Commission's draft rule required AEMO to consult on and define a UFE materiality threshold for each TNI which is not a market connection point (i.e. the connection points where a distribution network connects to a transmission network). It was expected that AEMO's consultation would cover the metric and level to be used for the threshold. If the threshold was exceeded, any market customer⁵⁴ that had a financial interest in the TNI where the exceedance occurs could request that AEMO undertake a review into the likely causes of UFE.

The draft rule also provided that TNSPs, DNSPs, market customers and generators must provide information and assistance that AEMO may reasonably require to complete the study and identify the likely sources of UFE at the TNI, or TNIs, to which the request relates. The potential involvement of market customers and generators is necessary to identify registration errors, and other issues that the other parties may not be able to identify on their own.

3.5.2 Stakeholder views on the draft determination

Transparency from moving to global settlements

Few stakeholders specifically commented on the extent to which transparency through the move to global settlements would result in benefits through a reduction in settlement disputes. Of those submissions that did AGL Energy, Origin Energy, EnergyAustralia continued to consider that there would be material benefits through timely resolution of settlement disputes.⁵⁵ In contrast, Sumo noted that there is a lack of transparency as to the costs of settlement disputes and the extent to which global settlements might resolve those disputes.⁵⁶

In addition to comments about benefits of transparency, EnergyAustralia, Energy Queensland and Red Energy/Lumo Energy considered there should be more explicit requirements on

⁵³ Origin Energy, consultation paper submission, p. 3.

⁵⁴ A large customer is an energy user whose annual electricity consumption exceeds the threshold of a small customer. These thresholds are set on a jurisdictional basis. The current thresholds are: 160 MWh in South Australia; 150 MWh in Tasmania; 100 MWh in ACT, New South Wales and Queensland; and, 40 MWh in Victoria.

⁵⁵ Submissions to the Consultation paper: AGL, p. 1; EnergyAustralia, p.1; Origin Energy, p.1.

⁵⁶ Sumo, submission to the Consultation paper, p.1.

AEMO to publish information to allow them to verify their UFE allocation.⁵⁷ For example, EnergyAustralia considered that:⁵⁸

"As drafted, all retailers will be able to reconcile their wholesale metered consumption charges from AEMO against data provided by MDPs. However, they will not be able to reconcile the value of UFE they are also charged for. We suggest that AEMO publish the total volume of consumption at each TNI, or UFE aggregation point, in addition to the calculated volume of UFE for that point. This would allow retailers to validate their proportion contribution to the total load, and to subsequently validate their allocated portion of UFE volumes."

Transparency at the TNI level and actions to resolve UFE

DNSPs, retailers and AEMO considered that while there are likely to be benefits from transparency of UFE at the TNI level there are a number of significant barriers to achieving this, particularly within the timeframes for the implementation of global settlements.⁵⁹ For example, AEMO considered that:⁶⁰

"As the cost of implementing TNI calculation would be significant for both AEMO and DNSPs, AEMO considers that this requirement, and related provisions such as UFE thresholds, should not be included in the Rule. Reporting of UFE at any point within the local area is not critical to the implementation of global settlement and should be decoupled from the Rule change. AEMO could explore options to enhance UFE reporting following commencement of global settlement. For example, an assessment of calculation at TNI level could be trialled in an area that does not operate a VTN for settlement and has a stable TNI to NMI relationship."

In addition to submissions to the draft determination, Commission staff held discussions with Energy Networks Australia members and a number of individual DNSPs. Of particular relevance to the NMI-to-TNI mapping were discussions with SAPN and Ausgrid regarding TNI mapping within their VTNs. Both DNSPs noted that for many TNIs they would be able to provide this information and that they considered it would be useful. However, they would likely need to seek an exemption from AEMO because:

- Within their CBD areas physical switching occurs on a regular basis, and they do not have systems which automatically monitor this and the resulting changes in energy flows. To provide accurate data they would therefore need to build these systems from scratch and this cost would be significant. These points were similar to those raised by TasNetworks in its submission to the consultation paper.
- They do not have mapping information for significant proportions of unmetered loads connected to their networks. Developing this information would take significant time as it

⁵⁷ Submissions to the draft determination: EnergyAustralia, p.1; Energy Queensland, p.5; Red Energy and Lumo Energy p.2.

⁵⁸ EnergyAustralia, submission to the draft determination, p.2.

⁵⁹ Submissions to the draft determination: Arora Energy, p.2; TasNetworks, p.2; ENA, p.1; AusNet Services, p.1; AGL, p.3; CitiPower, Powercor and United Energy, p.1; PLUS ES, p.1.

⁶⁰ AEMO, submission to the draft determination, p. 3.

would involve physical verification of the specific sites and detailed discussion with customers. This issue was also raised by a number of DNSPs which do not utilise VTNs. AEMO concurred with DNSPs. AEMO considered that these DNSPs would likely be granted an exemption under the draft rule because the work required to determine each of these is likely to be costly and difficult to implement in time for the commencement of global settlements.⁶¹ Only retailers and AEMO commented on the technical studies element of the draft rule. Retailers were generally supportive of the framework.⁶² They considered that with UFE allocated to retailers and there being some elements of UFE that can only be resolved by AEMO and DNSPs, it is important there is a formal framework for analysis of the causes of UFE to highlight these issues. For example, Origin Energy stated:⁶³

“Origin welcomes the introduction of a requirement for AEMO to determine thresholds for UFE at each transmission connection point. Determining a reasonable threshold at each connection point will allow an acceptable benchmark to measure the expected level of UFE. If UFE exceeds this threshold an investigation can be commenced quickly, and reasons for the increase can be determined. Origin would appreciate AEMO consulting with participants when it is determining the threshold levels.”

The Commission notes that these positions were based on the proposal in the draft determination that the threshold and technical studies would be at the TNI level.

AEMO considered that if the Commission adopted its proposal to remove the NMI-to-TNI mapping elements of the draft rule, the technical studies should also be removed. AEMO considered that if this occurred, it could explore alternative options to enhance UFE reporting following the commencement of global settlements.⁶⁴

3.5.3

Final determination: analysis and position

Transparency from moving to global settlements

The Commission retains its position from the draft determination in relation to the benefits of additional transparency from moving to global settlements. There are likely to be material market wide benefits from identifying UFE through AEMO undertaking a full reconciliation of the market. These benefits are based on material provided by AEMO and the Big 3 retailers.⁶⁵ They primarily relate to improvements in productive efficiency from a reduction in costs to resolve disputes and are conservatively estimated to be in the range of \$1 million a year.

In submissions to the draft determination retailers requested additional requirements in the final rule to allow them to verify their UFE allocations under global settlement. The draft rule required AEMO to publish UFE for each trading interval for each transmission connection

⁶¹ AEMO, submission to the draft determination, p.2.

⁶² Submissions to the draft determination: AGL, pp. 3 & 6; Origin, p.1; Alinta, p.2; EnergyAustralia, p.2; EnergyQueensland, p.5.

⁶³ Origin, submission to the draft determination, p.1.

⁶⁴ AEMO, submission to the draft determination, p.2.

⁶⁵ The Big 3 retailers include AGL Energy, Origin Energy and EnergyAustralia.

point in accordance with a procedure determined by AEMO.⁶⁶ The Commission considers two changes are needed to facilitate UFE verification by retailers under the final rule:

1. The intent of the information on UFE amounts in a local area that AEMO will be required to publish should be explicit. This will provide greater clarity and facilitate consultation between participants and AEMO regarding the exact form of the information to be provided when AEMO is developing its procedures. The final rule therefore states that: "AEMO must publish information to enable each market customer in a local area to verify UFE amounts allocated to that market customer's market connection points in that local area for each trading interval in accordance with a procedure to be developed by AEMO".⁶⁷
2. The UFE verification requirements in the final rule provide for UFE verification at the local area level, not the transmission connection point level.⁶⁸ This change is necessary because the final rule removes the NMI-TNI mapping requirements from the draft rule and therefore verification should occur at the DNSP level.

The Commission notes that while this will allow verification of total UFE amounts by retailers at the local area level, it should not be read as requiring AEMO to publish all of the information required to verify every component of the calculation. This is because to do so would require AEMO to publish the information for each individual load in the NEM for every trading interval. This would include confidential information and be administratively burdensome.

Transparency at the TNI level and actions to resolve UFE

Removing the TNI mapping and technical study requirements

The Commission considers that the costs of calculating UFE at the TNI level within the global settlements implementation timeframes are likely to be significant because:

1. DNSPs would need to build systems to track energy flows between TNIs
2. significant work would need to be undertaken to map non-market unmetered load to allow NMI-TNI allocation

In this context it is likely that the cost of NMI-to-TNI mapping would exceed the benefits of doing so in many cases. AEMO would therefore be likely to grant exemptions from the requirement to do so for many DNSPs which would undermine the purpose of the provisions. On this basis the Commission has removed the NMI-to-TNI mapping elements of the draft rule.

The final rule also removes the requirement for AEMO to publish a UFE threshold and undertake technical studies if UFE exceeds the threshold. With the NMI-to-TNI mapping elements of the draft rule removed from the final rule, the threshold and studies could only apply at the DNSP level. The Commission considers that narrow technical studies would be unlikely to be effective when carried out over entire DNSP areas.

⁶⁶ NER, clause 3.15.5(b) of the draft rule.

⁶⁷ NER, clause 3.15.5(d)

⁶⁸ NER, clause 3.15.5 (d)

Issues without TNI mapping and technical study requirements

Without the TNI mapping and technical study elements from the draft rule, the final rule will not contain any requirement for AEMO to report on, assess, analyse and make recommendations to improve UFE outcomes. This is despite the move to global settlements placing AEMO in the position of being the only party that will have full visibility of UFE and a major part of the potential benefits relating to transparency of UFE. In particular, without additional reporting requirements under the final rule there will be no:

1. requirement for holistic reporting of UFE across the NEM
2. requirement or framework for AEMO to compare UFE levels against expectations and benchmarks
3. requirement for AEMO to investigate and analyse UFE
4. power for AEMO to request additional information from participants to undertake analysis of UFE
5. requirement for AEMO to identify appropriate actions to reduce UFE

Analysis and solution in the final rule

With the problem defined as above, the Commission considers that an AEMO reporting framework for UFE is an appropriate solution. Therefore, the final rule requires AEMO to produce and consult on a guideline and then publish on its website at least once a year, a report on UFE in accordance with the guideline.

The Commission considers that because of the lack of information regarding UFE under settlements by difference, the rules should provide high level guidance to AEMO regarding the purpose of the report, and the minimum content to be included in the report. AEMO will then need to consult with industry to develop the guideline once global settlements commences and more information regarding UFE is known.

The final rule therefore introduces a purpose for the UFE report, which is: "to provide information and analysis of UFE in each local area to facilitate efficient decreases in UFE over time". The report is required to include, at a minimum:

1. *Reporting on total UFE by local area over the reporting period.* AEMO should compile and make overarching information on UFE amounts at the local area level across the NEM, publicly available.
2. *AEMO's analysis of UFE in each local area against expectations and benchmarks determined reasonably by AEMO.* This analysis may be difficult in the first instance until AEMO becomes familiar with UFE within each local area. However, without this analysis UFE numbers may be anomalous and there could be little basis and direction for both the analysis of UFE and recommendations for action set out below.
3. *AEMO's analysis of the sources of UFE in each local area, including:*
 - *Analysis of areas within the local area.* Many stakeholders have noted that more granular geographic UFE information is likely to be valuable. DNSPs and AEMO have also highlighted in submissions that in many cases this information can be provided

relatively easily outside of CBD and VTN areas. AEMO should consider this issue in its reporting to allow for work to be undertaken to provide additional visibility.

- *Drivers and sources of UFE.* The sources of UFE and their respective solutions are diverse. Identifying the likely source of UFE will therefore be crucial to identifying actions to reduce UFE.
 - *Time (e.g. season, day, time of day).* Patterns of UFE that are occurring are likely to be important in identifying causes and solutions to reduce UFE.
4. *AEMO's recommended actions to gain further visibility of UFE.* With UFE being aggregated to the local area level a key function of the reporting framework will be to identify when more granular information should be gathered to identify UFE. As AEMO has noted in its submission (quoted above) there are already instances where trials to collect such information are likely to be worthwhile.
 5. *AEMO's recommended actions to decrease UFE.* While global settlements will improve the information provided regarding UFE and the incentives on retailers to minimise UFE, there are a number of possible actions that are either DNSPs (e.g. accuracy of DLF calculations) or AEMO's (e.g. unmetered load profiling procedures) responsibility to resolve and the reporting framework should make recommendations for these to occur. Furthermore, there may be cases over time where the global settlements arrangements can be improved and AEMO should recommend such actions. For example, throughout the rule change AEMO and Commission staff have considered whether a lower proportion of UFE should be allocated to retailers load for customers with advanced metering because they are less likely to be a source of UFE. However, with the lack of information regarding UFE there is a lack of evidence to support this. If AEMO reaches this conclusion post the introduction of global settlements it will be appropriate for it to make such recommendations.

Similar to that provided for the technical study requirements in the draft determination, the final rule provides AEMO the power to request reasonable information for the purpose of preparing its report.

The implementation timing of the reporting framework is set out in chapter 7.

3.6

Allocation of UFE

3.6.1

Analysis and position in the draft determination

After UFE is calculated, a decision is required on how it ought to be allocated. Currently, the local retailer pays for the full UFE amount. However, many of the benefits AEMO suggested could be achieved will only be realised through allocating UFE across all retailers. The arguments put forward by AEMO and stakeholders in submissions to the consultation paper for allocating UFE more broadly are that it would:

- provide for more cost-reflective retail prices
- improve the ability of local retailers to manage risk by balancing their retail and wholesale market positions
- improve incentives to reduce UFE.

Of those identified, the largest potential benefit from global settlement would be the reduction of UFE. The incentives faced by market participants to contribute towards this outcome are therefore particularly important. Some submitters were of the view that the incentives to reduce UFE would be unchanged or reduced under global settlement. However, the draft determination identified a series of ways in which UFE could be reduced through improved incentives, including:

- Removing the existing disincentive for independent retailers to identify commercial losses.⁶⁹
- Encouraging all retailers to replace type 6 accumulation meters with interval meters, in order to reduce UFE caused by NSLP profiling errors and access additional revenue protection measures inherent in advanced metering technology.
- Encouraging all retailers to engage in processes to improve the visibility of unmetered loads. This would include local retailers becoming involved in regions where they are currently not the local retailer.
- Leading to more scrutiny of DLF calculations, potentially leading to them becoming more accurate over time.

The draft determination suggested that due to these reasons UFE should be allocated more widely than to the local retailer. This would provide improved incentives for all retailers, resulting in UFE being smaller than if this UFE allocation did not occur. Some proportion of the reduction would be a saving for the market (e.g. commercial losses), while some other proportion will still exist (e.g. in more accurate DLFs), but be allocated differently. The potential savings for the market from reduced UFE represent increases in productive efficiency. The changes in allocation are likely to lead to increases in allocative efficiency because with businesses incurring the costs they cause, their prices will be more cost reflective.

Further, the Commission agreed with submitters to the consultation paper that there is a strong 'levelling the playing field' argument associated with global settlement that also has implications for market efficiency. The allocation of UFE solely to local retailers likely causes allocative inefficiency whereby the retail prices of all retailers are inefficiently high or low, since they would be relatively less cost reflective of customers' consumption or use of the network. This could be a very minor effect, obscured by the fact that some retailers are local retailers in some parts of the NEM, and independent in others. In any case, over time this has the potential to create structural distortions to retail prices and the market share of particular retailers. This issue becomes more severe as the market share of local retailers is reduced—a trend that is being observed in every region of the NEM where retail competition is present.

Similar logic applies to the local retailer risk management issue. To the extent that UFE allocations to local retailers complicate the process of balancing retail and wholesale

⁶⁹ While Red/Lumo (consultation paper submission, p. 3) correctly identified that the NER contains existing provisions for metering installation malfunctions to be addressed under clauses 7.8.10 and 11.86.7, these requirements only commence once the malfunction has been identified. It is conceivable that independent retailers may not dedicate as much effort as local retailers to identifying these losses as doing so would likely increase their own costs, and reduce the costs incurred by their competitor, the local retailer.

positions, local retailers face greater risk, which would be expected to bring higher costs relative to global settlements. This also has the potential to create structural distortions to retail prices and the market share of particular retailers. It becomes more severe as local retailer market share is reduced since UFE will come to be larger relative to the retail position that is being hedged.

How should UFE be allocated?

If UFE is going to be allocated more broadly, the key choices that need to be made are the basis for the allocation, and the area over which UFE is allocated.

In the consultation paper the Commission considered using ‘accounted for’ energy as the basis for allocation would be the most logical method. The Commission noted several options in its consultation paper, including allocation based on peak load, allocation to DNSPs and allocation through intra-regional settlement residues. Stakeholders generally supported the Commission’s analysis on these options—that each would be inferior to using ‘accounted for’ energy, as was proposed in AEMO’s rule change request.

Allocation based on peak load would be more complex to implement than AEMO’s proposal for not much, if any, additional gain from the allocation of UFE.⁷⁰ The DNSP allocation option, although a simple method of allocating UFE, is judged to be inferior to retailer allocation because it would be less explicit. Explicit allocation to retailers is more appropriate given that retailers are able to take actions to reduce UFE. The allocation of UFE through the intra-regional settlements residue is inferior for the same reason.

The options for the geographic area at which UFE could be allocated are:

- TNI level
- local area (i.e. DNSP network) level
- NEM region.

AEMO proposed that UFE should be allocated as locally as possible and that this is at the TNI. However, the Commission was of the view that allocation at a higher level (i.e. less granular) would be more desirable. The Commission considered there are a range of inefficient cross subsidies that could occur under the TNI option, and there could be localised distortions from high penetrations of embedded generation. More detail on these are provided in Box 4. These issues suggest that a less granular level would be more appropriate for *allocating* UFE (as opposed to *identifying* it, which is specified to occur at the TNI resolution).

BOX 4: POTENTIAL ISSUES ARISING IF UFE IS ALLOCATED AT THE TNI LEVEL

The Commission identified a number of cross subsidies that may arise if UFE was to be allocated at the TNI level, including:

⁷⁰ This is because the proportions of allocated UFE would most likely be similar across retailers, but higher during peak times. This being the case, the incentives provided to retailers could be similar to the less complicated implementation.

- A DNSP's DLF values are generally not unique to a particular TNI but rather apply for a given class of customer across the DNSP's network. For example, a residential customer in the central business district may be assigned the same DLF as a residential customer in a semi-rural area. The averaging of DLFs within a local area has the effect of transferring UFE between TNIs, which will result errors in the calculation of the UFE for each TNI. This would create cross subsidies between the retailers on the different TNIs (e.g. city versus semi-rural), if it was allocated at this level.
- Any errors in the assignment of NMIs to physical TNIs, whether temporary or permanent, will cause UFE to be transferred between TNIs within the local area. This will cause a cross subsidy between the local retailer and the FRMP(s) for the NMIs that have been misallocated. The cross subsidy would be proportional to the quantity of load that was incorrectly allocated.
- Energy from type 6 accumulation metering installations is allocated to trading intervals using the NSLP, and the NSLPs are calculated on a local area basis, rather than on a TNI basis. This could also result in energy being transferred between TNIs to the extent that different TNIs have above or below average numbers of accumulation meters. Similarly, energy could be transferred between TNIs when the loads on one TNI have profiles that differ significantly from the NSLP. This transferred energy would represent a cross subsidy between the retailers on the different TNIs if the UFE were to be calculated and allocated on a TNI level.

Allocating UFE at the local area would still be relatively granular, yet avoids the potential cross subsidies and localised distortions noted above. Although less granular, it would still have the benefit of capturing factors that may be contributing to UFE levels that are specific to a local area, and to the DNSP that serves this area. For example:

- DLFs are calculated separately for each local area. In particular, some DLF methodologies can result in non-technical losses being socialised through DLFs, whereas others do not.⁷¹
- NSLP profiling errors are specific to the DNSP region.
- UFE may be influenced by legacy metering decisions by DNSPs, which could result in different compositions of accumulation meters (contributing to NSLP profiling errors), and levels of commercial losses.
- Different methodologies for dealing with unmetered loads, e.g. a relatively conservative approach that overestimates the actual usage of unmetered loads could produce negative UFE.

A further benefit of local area allocation is that it accommodates the continued use of VTNs. This is discussed further in chapter 5.

⁷¹ Some methodologies, such as those used by the Victorian DNSPs, effectively assume that all historical UFE is an unaccounted for technical loss. In this way, commercial losses, NSLP errors, and other non-technical issues, can end up being recovered through DLFs, but with a one year lag (as DLFs are calculated on an annual basis).

The final allocation option is to allocate UFE across each NEM region. The Commission considered that this would be less desirable as it would dilute the components of UFE that could be specific to a particular network region. It is also not necessary to allocate UFE in this way to accommodate the continued use of VTNs, as local area allocation is sufficient for this. For these reasons, the Commission considered that the local area is the most appropriate resolution for allocating UFE. This will provide the most efficient incentives for retailers to address UFE.

The Commission notes that most retailers will be facing charges for UFE for the first time on the commencement of the rule. The Commission therefore supported a 'soft start', as proposed by AEMO, allowing for UFE to be understood and potentially reduced, before it is allocated. This is discussed in chapter 7.

3.6.2

Stakeholder views on the draft determination

There was strong support from stakeholders for the proposal to allocate UFE at the local area level.⁷² For example, TasNetworks considered the Commission's position strikes an appropriate balance between settlement accuracy and potential distortions resulting from settlement at a more granular level. TasNetworks also considered it would reduce changes required to AEMO and DNSP systems and thereby minimise the transition costs which would otherwise be passed on to customers.⁷³

Similar to submissions to the Consultation paper, stakeholders generally supported allocation of UFE within global settlements to retailers based on consumption.⁷⁴ However, some stakeholders questioned how strong the incentives resulting from this would be and some stakeholders considered if this occurred additional incentives should be placed on DNSPs to reduce UFE. Aurora Energy and Sumo Power also raised concerns regarding the impact on competition from the proposal.⁷⁵

Sumo Power suggested it was not clear how they would drive down UFE to manage the risk. Sumo raised particular concern around the risk that unmetered loads will place on settlement.⁷⁶ Alinta suggested the move to global settlements would not accelerate the deployment of advance meters, except in cases where there were systematic and material errors rising from the net system load profile. Alinta considered the business case and speed of deploying advanced meters would not likely be influenced by global settlements.⁷⁷

In its submission, ERM Power referenced a recent report by New Zealand's Electricity Authority that identified an advanced meter rollout as one of the most significant drivers of UFE reductions in New Zealand.⁷⁸ ERM Power went on to make a case that small customers with advanced meters, and large customers that have particularly accurate meters with

⁷² Draft determination submissions: AEMO, p. 2; AGL, pp. 1-2; CitiPower, Powercor and United Energy, p. 2; Energy Queensland, p. 5; Origin Energy, p. 1; TasNetworks, p. 1.

⁷³ TasNetworks, draft determination submission, p. 1.

⁷⁴ Draft determination submissions: AEMO, p. 2; Energy Queensland, p. 5; Plus ES, p. 1.

⁷⁵ Submissions to the draft determination: Aurora Energy, p.2; and Sumo Power, p.2.

⁷⁶ Sumo Power, Draft determination submission, p. 2.

⁷⁷ Alinta Energy, draft determination submission, p. 2.

⁷⁸ ERM Power, draft determination submission, pp. 2-3.

mandated regular maintenance, are unlikely to be the drivers of UFE. ERM therefore considered that large customer should be exempted from paying UFE.⁷⁹ Instead they suggested a methodology be developed that apportions UFE to accumulated metered load, type 7 load and unmetered load only, as this would allocate the risks appropriately and provide a stronger incentive to reduce UFE through advanced metering.⁸⁰

AGL and CitiPower, Powercor, and United Energy suggested an incentive be placed on DNSPs to reduce UFE levels.⁸¹ For example, in their joint submission, CitiPower, Powercor, and United Energy suggested that distributors would be able to better identify sources of UFE across their networks including errors in measurement of distribution losses, errors in estimating franchise customer unmetered loads and theft. The submission went on to propose incentives or programs of work for distributors to proactively identify UFE and its sources, and reduce UFE.⁸²

3.6.3

Analysis and final position

The Commission retains its position from the draft determination that UFE should be allocated to all retailers at the local area level, based on 'accounted for' energy consumed.⁸³ The Commission continues to consider that this will improve incentives to reduce UFE and create a platform for equal competition. As described in section 3.6.1, this will result in increases in productive and allocative efficiency. This section addresses issues raised by stakeholders on the allocation of UFE in the draft determination, which can be summarised as follows:

- UFE allocation may not necessarily increase the speed of the rollout of advanced meters
- customers that do not necessarily contribute to UFE may be 'unfairly' penalised by its allocation
- DNSPs should also be incentivised to reduce UFE levels
- UFE may have negative impacts on the state of retail competition.

The impact of UFE allocation on the speed of advanced meter rollout is likely to be influenced by a range of factors, including a retailer's specific business model, its procurement processes and the size of its customer base. However, the most important factor is likely to be the size of the UFE costs to the retailer. For example, if the UFE is positive (i.e. additional revenue) or a small negative, it is unlikely that an advanced meter rollout would be affected. Conversely, if UFE is a significantly large negative cost to the retailer, it may affect the retailer's strategy. Regardless the decision on how advanced meter rollouts are affected, this will ultimately be a business decision for the retailer, which should result in a more efficient allocation of resources overall.

⁷⁹ ERM Power, draft determination submission, pp. 3-4.

⁸⁰ ERM Power, draft determination submission, p. 4.

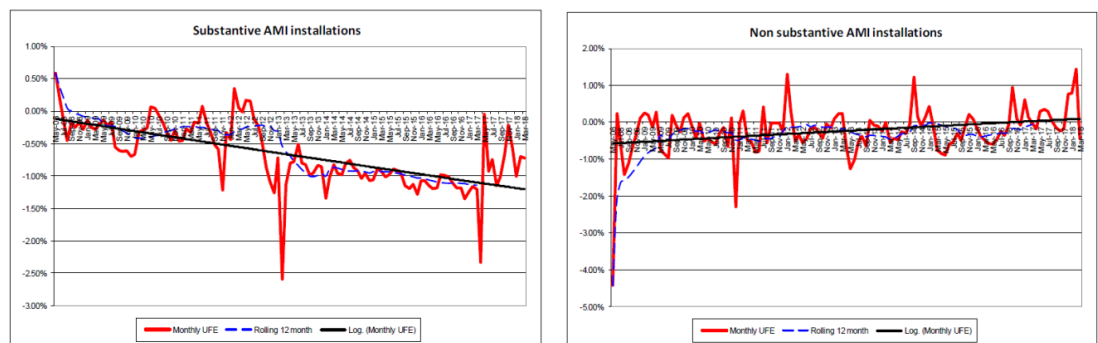
⁸¹ AGL Energy, draft determination submission, pp. 1-2.

⁸² CitiPower, Powercor and United Energy, draft determination submission, p. 2.

⁸³ UFE would only be allocated to loads in the local area calculated for each trading interval. Any generation located in the DNSP would not be allocated any UFE during a trading interval where it is a net exporter.

ERM Power's submission noted that New Zealand has experienced a strong correlation between advanced meter rollouts and UFE levels, as illustrated in Figure 3.1 below. However, while the level of UFE is reducing for networks with a substantive penetration of AMI installations, UFE is actually growing more negative and larger in magnitude over time. The Commission also notes that UFE for networks with a low penetration of AMI installations have a much lower magnitude of UFE in absolute value, even though it is slowly increasing. Furthermore, it is unclear why UFE is becoming more negative in networks with higher penetrations of AMI installations and whether this trend could be expected in the NEM.

Figure 3.1: UFE levels in New Zealand and advanced meters installations



Source: NZ Electricity Authority, Decision paper for Guidelines on the calculation and the use of loss factors for reconciliation purposes, p. 6.

ERM Power made the point that as UFE may be caused predominantly by non-advanced metered load it would be 'unfair' on retailers with load with advanced meters to pay for UFE. The Commission considers that there may be merit to this proposal because if designed in a way that the UFE allocation reflected true reductions in UFE caused by such customers it would provide an efficient incentive for retailers to rollout advanced meters. However, it relies on the premise that in the NEM there will be a strong correlation between UFE levels and advanced meter rollouts. Unfortunately, due to the absence of observable UFE information under the settlements by difference framework, the relative magnitudes and causes of UFE are unknown. The Commission therefore considers it would be premature to recuse all retailers load which is provided by advanced meters from UFE allocations.

The Commission notes that under the AEMO UFE reporting framework in the final rule, AEMO is required to analyse sources of UFE and make recommendations for means to efficiently reduce UFE. The issue of UFE allocation to smart metered load will be able to be considered through this framework, and if it is found that non-advanced meter load contributes the vast majority of UFE, it could submit the AEMC a rule change request.

In regard to the allocation of UFE to DNSPs or provision of incentives to DNSPs to reduce UFE, the Commission does not consider this is necessary. The majority of the functions that DNSPs undertake that can result in UFE are approved by AEMO (e.g. estimation of unmetered load) or the AER (e.g. DLF calculations). Should these sources be identified as the causes of UFE, improvements can be required by AEMO and the AER instead of allocating

UFE to DNSPs or requiring specific incentive arrangements to be provided. The Commission notes that the reporting framework will allow for AEMO to analyse these sources and make recommendations for actions by DNSPs to reduce them.

Finally, regarding the impact that UFE allocation would have on the entry and expansion of retailers, the Commission recognises that the cost to serve each customer will change under global settlements. In the instance that UFE is negative, it would increase the per customer costs of retailers other than the local retailer which would change the business case for entry or expansion. The Commission considers, based on the international experience, that these changes are unlikely to be material enough to be a significant factor in such decisions. However, if this was to occur, this would be a move to a more accurate allocation of cost per customer, and thereby a more efficient allocation of resources for the retail market as a whole.

The Commission also notes that it considers a move to global settlements is likely to be inevitable in the long term because settlements by difference is not a fit for purpose framework in competitive retail markets. Prudent retailers considering entry and expansion would therefore take into account the potential cost of a move to global settlements at a later date. However, the retailer would have to do so without transparent information of what that cost would be, which would increase the risk in such decisions.

3.7 Assessment against the National Electricity Objective

3.7.1 Analysis and position in the draft determination

In the draft determination, the Commission considered the largest benefits of global settlement relate to a reduction in UFE and the avoided costs of settlement disputes. As discussed above, the current volume of UFE is unknown, as is the extent to which it could be reduced through actions undertaken by retailers, DNSPs and AEMO. Nonetheless, international experience from New Zealand suggests that a reduction of between 0.1 and 0.3 per cent in total energy may be possible. A fraction of this is expected to be eliminated entirely, producing a saving of, perhaps, a few million dollars a year.⁸⁴ Add to this the Commission's estimate of the avoided costs of settlement disputes—conceivably in the low millions of dollars a year when the costs to all entities are included—and the potential annual benefit from these two sources is likely to be in the range of \$3m to \$5m. These numbers are indicative only, based on the assumptions noted here.

There are also other possible benefits that could be material but are harder to quantify. These include savings for local retailers from being able to manage risk more effectively and more cost reflective retail prices, avoiding potential structural distortions to retail prices and the market share of particular retailers.

The costs that have been identified by AEMO include an estimate of "less than \$5m" to implement changes to its own systems, as well as unquantified costs that would be incurred

⁸⁴ A rough estimate of NEM wholesale settlements is \$10b in a year. Assuming that wholesale charges are 30% of retail prices and network charges are 50%, the total value associated with wholesale energy and network charges could be ~\$27b a year. A 0.1% reduction would be \$27m a year. A fraction of this could be characterised as a net saving to the market from a move to global settlement. For argument's sake, this portion is assumed to be 10% of total UFE.

by MDPs, retailers and DNSPs. AEMO identified some of the system and procedure changes that would be required in its High Level Design document.⁸⁵

The system change and data handling costs for AEMO and MDPs depend largely on the file format to be used by AEMO. However, the Commission considers that the changes involved in either scenario would be relatively minor because the volume of metering data that MDPs need to transmit will actually *decrease* under global settlement. There are two main reasons for this:

1. In some cases, MDPs already send, and AEMO already receives, metering data for customers of local retailers.⁸⁶
2. Under global settlement, MDPs would no longer provide local retailers with the metering data for the customers of independent retailers.

Consider the following indicative example: there are one million customers and the local retailer has a 30 per cent market share. Assuming AEMO's first data format option, the MDP would transmit 2.4m metering data profiles under settlement by difference (700,000 to independent retailers, 700,000 to AEMO, 1 million to the local retailer). Under global settlement, this would be reduced to 2m (700,000 to independent retailers, 1,000,000 to AEMO, 300,000 to the local retailer).

Alternately, if AEMO is to adopt its second option (using the MDFF file format), it is likely that there would be a net decrease in the metering data transmitted by MDPs, since the MDM file format would cease. On this basis, the Commission expects that the changes required by MDPs to implement global settlement, over and above changes that are otherwise required for the delivery of five minute settlement, will likely be relatively minor, and therefore cost less than the \$500,000 suggested by Ausgrid. Other stakeholders also thought that these costs would be minor.⁸⁷ AEMO's system changes to accommodate the MDFF file format are expected to be relatively small as they would be integrated with the five minute settlement changes.

There were mixed views on the likely implementation costs that would be incurred by retailers. On balance, the Commission expects that these will be modest on the basis that the affected systems are already subject to changes to implement five minute settlement. It is notable that AGL Energy and Origin Energy, which possess some of the largest and most complex IT systems in the market, thought that there will be no significant costs to them to implement the change. To the extent that there are incremental changes, such as the additional bill line item identified by Flow Power, the Commission expects that these costs will also be modest. The two and half year implementation period provides the opportunity for these changes to be packaged with updates that would have occurred irrespective of this rule change.

DNSPs are expected to incur costs to implement the Commission's chosen courses of action regarding unmetered loads (Chapter 4) and VTNs (Chapter 5). Both of these are expected to

⁸⁵ AEMO, High Level Design, pp. 15-16.

⁸⁶ AEMO, High Level Design, p. 14; Red Energy and Lumo Energy, p. 1.

⁸⁷ AGL Energy, consultation paper submission, p. 7.

be largely one-off costs to provide information that is not currently provided to AEMO. In the case of unmetered loads, new or augmented systems for inventory management potentially need to be created. The Commission considers that the new provisions should be implemented in such a way by AEMO that these costs should be in the low \$200,000s per DNSP. There are 12 DNSPs in total, suggesting aggregate implementation costs around \$2.5 million. The costs to DNSPs from providing the 'mapping' data for VTN customers is more minor, and the draft rule contains a mechanism for an exemption when a net benefit is unlikely. Hence, an indicative, total cost for DNSPs is \$3 million.

By this analysis, it seems likely that implementing global settlement would be in the long term interest of consumers. The one-off implementation costs estimated in the analysis in the draft determination would be around \$10 million. No significant on-going costs have been identified, in part because the change in the volume data transmitted due to global settlement is expected to be a decrease. In comparison, the quantifiable benefits have been indicatively estimated as being in the range of \$3m to \$5m a year. Further, unquantified benefits are expected to arise from retail prices being more cost reflective, contributing to the dynamic efficiency of the market over time. In aggregate, it is likely that the benefits will be greater than the costs associated with global settlement, providing for efficiency benefits from which consumers of electricity will ultimately benefit over the long term.

A further consideration is that, in reaching the conclusion that a move to a global settlements framework is likely to be in the long term interests of consumers, the Commission considers that the relevant counterfactual is not necessarily the status quo. As with markets around the world where retail competition is maturing, a move to global settlements is likely to be required at some point in the future if it is not undertaken at this time. The further development of retail competition across the NEM is likely to continue to decrease the proportion of customers served by local retailers. This will exacerbate the problem of local retailers bearing the costs and risks of UFE and is likely to eventually necessitate a move to a global settlements framework. Importantly, if this occurs at a later date it is likely to result in higher costs when the systems changes are not made in synergy with the five minute settlement rule change.

3.7.2

Stakeholder views on the draft determination

Benefits of the rule change

As with the consultation paper, the vast majority of submissions to the draft determination supported the move to global settlements.⁸⁸ Stakeholders agreed with the draft determination, proposing the rule change would:

- improve transparency, which would lead to fewer and more timely resolution of settlement disputes, greater visibility of unmetered loads⁸⁹

⁸⁸ Draft determination submissions: AEMO, p.1; Alinta Energy, p. 1; AGL Energy, p. 1; AusNet Services, p. 1; CitiPower, Powercor and United Energy, p. 1; EnergyAustralia, p. 1; Energy Networks Australia, p. 1; Origin Energy, p. 1; Public Interest Advocacy Centre, p. 1; TasNetworks, p. 1.

⁸⁹ Draft determination submissions: Public Interest Advocacy Centre, p. 1; AGL, p.1; Origin Energy, p. 1.

- removed distortions in retail competition where local retailers subsidise competitors due to the allocation of losses⁹⁰
- incentivise all retailers to reduce commercial losses by exposing them to the risk of UFE, leading to improved efficiency and reduced losses.⁹¹

However, EnergyAustralia did suggest that the benefits of the rule change will not be immediately realised without further costs being incurred by AEMO and industry participants, and used the example of each instance of an error being identified would likely require investigation, and possibly disputes or negotiation to resolve the issue and reconcile historical charges.⁹² Further submissions on the benefits are discussed in section 3.5 and section 3.6.

Implementation costs – networks and meter data providers

Some stakeholders raised concerns about the costs associated with the design of the rule change in the draft determination.

Meter Data Provider, Plus ES noted that the implementation being promoted by AEMO involved a move from MDM file format to MDFF for the delivery of accumulated metering data to MSATS would be a significant unnecessary cost for the policy. Plus ES estimated that the change would take 6 months and cost a minimum of \$200,000 for them to implement.⁹³

CitiPower, Powercor and United Energy considered that the cost associated with providing data on unmetered connection points in at the TNI level the timeframes proposed would be considerably higher than the estimates in the draft determination. It estimated the IT systems costs of such changes would be around \$1.5 million.⁹⁴ However, the Commission notes (discussed in section 3.5, the final rule moves away from TNI level estimation of UFE and provides significantly more time for the changes to be made, so these costs are likely to be avoided. It also noted that aligning implementation with 5 minute settlement would reduce costs to consumers.⁹⁵

Implementation costs – retailers

Retailers had significantly different views on their respective costs of implementing global settlements.

ERM Power noted in their submission that there would be material cost faced by retailers. These would include changes to their settlement calculation systems, forecasting, reconciliation processes, customer contract terms and conditions, billing systems, IT project costs, staffing changes and impact on prudential security. ERM Power considered these costs would add up to a figure considerably larger than that proposed in the draft determination.⁹⁶ Aurora Energy, noted implementation costs for their business was estimated at around

90 Draft determination submissions: Public Interest Advocacy Centre, p. 1; Energy Queensland, p. 4; AGL, p. 1; Origin Energy, p. 1, EnergyAustralia, p. 1.

91 Draft determination submissions: Public Interest Advocacy Centre, p. 1; CitiPower, Powercor, United Energy, p. 1.

92 EnergyAustralia, draft determination submission, p. 1.

93 Plus ES, draft determination submission, p. 2.

94 CitiPower, Powercor, and United Energy, draft determination submission, p. 1.

95 CitiPower, Powercor, United Energy, draft determination submission, p. 1.

96 ERM Power, draft determination submission, p. 2.

\$500,000.⁹⁷ Red Energy/Lumo Energy estimated the one-off costs to retailer IT systems, mobilisation of staff and changes to data provision would be in the order of \$2 million.⁹⁸

These retailers were also of the opinion that the costs of implementation would outweigh the benefits from implementing the rule change. Aurora Energy raised concerns that the AEMC had not provided robust evidence that the efficiency benefits of the rule change outweighed the implementation costs, particularly in Tasmania where Aurora Energy serves the majority of customers.⁹⁹ Similarly, Sumo Power noted it was not satisfied the draft rule identified any problem with UFE that needs to be solved, as the level of UFE and magnitude of the problem is unknown.¹⁰⁰ ERM Power acknowledged that transparency will be improved under global settlements, but questioned the net benefit from levying UFE on all customers, suggesting large commercial and industrial customers will not benefit from the changes, and will be financially worse off.¹⁰¹ Finally, Red Energy/Lumo Energy suggested the benefits observed in New Zealand were not relevant to Australian circumstances.¹⁰²

Alternatively, EnergyAustralia suggested that the implementation costs for retailers are likely to be small in comparison to that required for five minute settlements, assuming retailers continue to receive the same data in a similar format from AEMO and Meter Data Providers, resulting in minimal mandatory changes to systems and processes. EnergyAustralia note there may be additional costs incurred to process data relating to unaccounted for energy (UFE) allocations, but again anticipate these to be small.¹⁰³

3.7.3

Analysis and final position

The Commission has assessed the benefits and potential costs of implementing global settlements. The Commission maintains its position from the draft determination that a move to global settlements will be in the long term interest of consumers. The remainder of this section addresses stakeholders issues in relation to the assessment in the draft determination and builds on that analysis where new issues have arisen.

Benefits of global settlements

As noted in section 3.5.2, section 3.6.2, and section 3.7.2, the majority of stakeholders recognised and supported the benefits identified in the draft determination.

An additional benefit from the move to global settlements that was not identified in the draft determination is the incentives provided to retailers to decrease profiling errors arising from the introduction of the five minute settlement rule change. As of July 2018, there were around 9.9 million type 4-6 meters installed in the NEM, of which approximately 6 million are type 6, and 3.7 million are types 4 and 5. Under 30 minute settlement, only 6 million accumulation meters adopt a net system load profile and therefore result in profiling errors.

⁹⁷ Aurora Energy, draft determination submission, p. 2.

⁹⁸ Red Energy/Lumo Energy, draft determination submission, p. 1.

⁹⁹ Aurora Energy, draft determination submission, p. 1.

¹⁰⁰ Sumo Power, draft determination submission, p. 1.

¹⁰¹ ERM Power, draft determination submission, p. 2.

¹⁰² Red Energy/Lumo Energy, draft determination submission, p. 1.

¹⁰³ EnergyAustralia, draft determination submission, p. 1.

However, under five minute settlement the possibility of errors for the 6 million accumulation meters increases with the additional granularity of profiling. Further, the type 4 and 5 meters that are installed before 1 December 2018 will not be required to capture data at a five minute granularity, and therefore may be profiled, further increasing the chance of profiling errors.¹⁰⁴ Placing incentives on retailers to reduce UFE therefore becomes increasingly important. Global settlements will provide incentives for retailers to reduce some of these errors by reprogramming capable type 4/5 meters to capture five minute data to reduce these profiling errors.

The Commission recognises the point made by EnergyAustralia that these benefits will not be effective immediately, rather they will be realised over time as the settlement process improves in its efficiency, with risks and benefits being allocated in a more reflective manner. The Commission considers its estimates of the benefits reflect this point because they are annual benefits, not up front benefits.

Based on the experience of the move to global settlements in New Zealand, in the draft determination the Commission estimated the benefits from reduced UFE and settlement disputes at between \$3-5 million per year. Some submissions to the draft determination by retailers question the materiality of these benefits and the comparability to New Zealand.¹⁰⁵ The Commission does recognise that the New Zealand experience is likely to be different to that in Australia as the physical network and market design between the two markets are different.

In New Zealand, there are 29 distribution networks or 'line companies' which each has a unique DLF developed to calculate their losses. In the NEM there are only 13 DNSPs, each with a limited number of DLFs to represent quite different network locations, serving a significantly larger geographical area than in New Zealand. Therefore, at face value, there is a greater chance of unaccounted for technical losses in the NEM. Further, New Zealand does not have five minute settlements at the moment, so would not require the same level of profiling, and may have smaller profiling errors as a result. Considering that there is potentially greater levels of errors associated with DLFs and profiling metering, it could be argued that the UFE levels and therefore the need to address UFE could be greater in the NEM than in New Zealand. The Commission therefore believes the benefits from implementing global settlements would be in excess of those estimated in the draft determination.

Costs of global settlements

In the draft determination, the Commission estimated the costs of implementing global settlements at around \$10 million in once-off costs.

Most of the commentary in submissions to the draft determination focusing on costs was from retailers. However, there were significant differences between the cost estimates for different retailers. Aurora Energy estimated their implementation costs at around \$500,000,

¹⁰⁴ Type 4 and 5 meters installed before 1 December 2018 will not be required to record 5 minute data. These meters will instead be profiled from half an hour to 5 minutes.

¹⁰⁵ Draft determination submissions: Aurora Energy, p. 1; Sumo Power, p. 1; Red Energy/Lumo Energy, p. 1.

while Red Energy/Lumo Energy estimated their implementation costs at around \$2 million. However, neither party provided sufficient detail on the source of these costs besides general IT system change and staff costs.

ERM considered that their implementation costs include “settlement calculation systems, forecasting, reconciliation processes, customer contract terms and conditions, billing systems to accommodate the dynamic charge, IT project costs, staffing for change management and the impact on prudential security”.¹⁰⁶ While some of these costs submitted by ERM may be material, others are expected to be minor. For example, the transition period provides retailers 3 years and two months to prepare for the change. It is expected that, given the numerous changes in retail billing requirements specified in recent changes to the Victorian Retail Code and the AER’s Retail Pricing Information Guideline in the past year alone, retailers will need to update their specific billing systems for changes in the short term in any case. Further, staffing and IT project costs that would be additional to that incurred preparing for the five minute settlement IT upgrades, which encompass wide spread changes for IT systems and AEMO procedures, would be expected to be relatively minimal.

In contrast to the submissions discussed above, EnergyAustralia suggested that the costs of implementing the rule change would be relatively small. Origin Energy, AGL Energy and AEMO also made a similar point in submissions to the consultation paper and discussions with the Commission. This disparity suggests the relative cost of the rule change may be dependent on the specific retailers IT systems and processes. For example, retailers with more bespoke, less dynamic systems would require more significant changes than other retailers that use more flexible, generic systems.

The Commission also notes that its changes in the final rule from the draft rule are likely to result in lower implementation costs. As discussed in section 3.5, the Commission has moved away from NMI-to-TNI mapping for DNSPs. While for retailers, the final rule extends the time for implementation by delaying the soft start to 1 July 2021.

Broader NEO issues

The estimates of costs expressed above are relative to a status quo scenario, in which there are no significant changes in perpetuity. However, this is not necessarily the case. The Commission has identified two counterfactual scenarios that are relevant to consider, namely:

1. If a global settlements regime was not introduced at this time, the Commission would likely require AEMO to obtain the additional information from participants to allow the calculation of UFE to increase transparency and reduce settlement dispute resolution costs. This change would incur the costs of changes to data provision, additional information provision for unmetered loads and AEMO system changes to calculate UFE. However, it would come without the incentive and competition benefits described above.
2. As with markets around the world where retail competition is maturing, a move to global settlements is likely to be required at some point in the future. The further development of retail competition across the NEM is likely to continue to decrease the proportion of

¹⁰⁶ ERM Power, draft determination submission, p. 2.

customers served by local retailers. This will exacerbate the problem of local retailers bearing the costs and risks of UFE and is likely to eventually necessitate a move to a global settlements framework. Importantly, if this occurs at a later date it would result in higher costs when the systems changes are not made in synergy with the five minute settlement rule change.

In considering the immediate implementation costs, and potential benefits in the context of these two counterfactuals, the case for the move to global settlements becomes considerably stronger. Under the first scenario, a considerable proportion of the costs of moving to global settlements would be incurred, but not all the benefits would be realised. In the second counterfactual scenario the cost of implementing the change would eventually be realised, however without the synergies of the implementation of five minute settlement. The Commission therefore is of the view that the move to global settlements will be in the long term interest of consumers.

3.8 Commission's final position

Having considered AEMO's proposal in detail, the Commission is of the view that there would be benefits to the market from AEMO calculating the volume of UFE that exists in the market, and for this UFE to be allocated to all retailers, not just local retailers. However, in contrast to AEMO's proposal, the Commission considers that implementing global settlement in such a way that UFE is calculated by AEMO and allocated to retailers based on their 'accounted for' energy across each local area, will best contribute to the NEO. This allocation would be accompanied by regular reporting by AEMO of the potential causes or and ways to reduce UFE.

4 UNMETERED LOADS

This chapter sets out the Commission's policy for the treatment of non-type 7, unmetered loads under global settlements.

4.1 Issue

There are many standalone loads that connect to the NEM which do not have a meter. These standalone loads are generally unmetered due to very low consumption levels making them not cost effective to meter. For example, it would be impractical to meter every individual streetlight.

Unmetered loads that are reliable, predictable and able to be calculated can be classified as a type 7 metering installations.¹⁰⁷ The defining characteristic of type 7 loads is that the metering data produced is by a calculation rather than being physically metered. To maintain the integrity of energy settlement in the NEM the calculation is required to be sufficiently accurate to enable each load to be settled in the market for each trading interval. For example, across all jurisdictions street lights, and in New South Wales and South Australia, traffic lights are classified as type 7 metering installations. Each category of type 7 metering installation is registered with AEMO and the calculated load is processed through MSATS. These loads are also fully contestable, so any retailer can service these loads.

Where an unmetered load does not fall into an established type 7 metering installation category, they are settled out of the market through a negotiated agreement between the customer (referred to as a *franchise customer* in the NER), the LNSP and the local retailer. The LNSP and the local retailer are remunerated for the energy and network provision associated with these loads by the franchise customers. Franchise customers have typically been local councils and telecommunications companies.

Examples of off-market or non-market unmetered loads include, but are not limited to:

- sports ground flood lights
- public BBQs
- cable TV hubs
- NBN cabinets
- public telephones
- public sprinklers/irrigation
- parking ticket machines
- bus shelters
- CCTV cameras
- parking sensors.

Currently, as non-market unmetered loads do not enter NEM settlements, and are served by the local retailer, they are part of UFE. This is currently not a problem in terms of UFE

¹⁰⁷ See Box 4.1 for more information

allocation (other than the lack of transparency it creates), because UFE is charged to the local retailer and the local retailer charges franchise customers for the non-market unmetered load. However, under global settlements, non-market unmetered loads need to be accounted for in settlements and thereby removed from UFE to avoid all retailers being charged for load that the local retailer is being paid for.

4.2 AEMO's view

In the rule change request, AEMO identified that non-market unmetered loads need to be identified and removed from the UFE calculation to avoid double counting.¹⁰⁸ AEMO proposed two possible solutions for the management of non-market unmetered loads:

1. The Minister of the participating jurisdiction may submit changes to jurisdictional metrology material that require AEMO to update the Metrology Procedure with new categories of unmetered loads that can be treated as contestable type 7 metering installations. Once established as a type 7 unmetered load, calculations would need to be determined to facilitate the treatment of the load in AEMO's MSATS for settlement.
2. The retailer and DNSP agree the quantum of energy being traded for the unmetered loads within the local area and declare that total load to AEMO for use in settlement.

4.3 Stakeholders view on consultation paper

Of the 18 submissions on the global settlements consultation paper, eight submissions commented on the treatment of unmetered loads.

DNSPs suggested that while each unmetered device consumes a small amount of energy, in aggregate the volume of energy is material. AusNet Services submitted unmetered devices consume close to \$5 million in network revenue per year.¹⁰⁹ Ausgrid noted it had 170,000 non-market unmetered devices connected to its network.¹¹⁰ Energy Networks Australia suggested one of its members had 8,000 franchise customer connections with varied fuse limits and a combined consumption of 10 GWh, and another distributor had similar figures of 10,000 connections with a combined consumption of 11 GWh.¹¹¹ The most detailed breakdown of non-market unmetered connections was provided by South Australian Power Networks in discussions with Commission staff. This is presented in Table 4.1 below.

¹⁰⁸ AEMO, High level design, p. 12.

¹⁰⁹ AusNet Services, consultation paper submission, p. 2.

¹¹⁰ Ausgrid, consultation paper submission, p. 4.

¹¹¹ Energy Networks Australia, Consultation paper submission, p. 1.

Table 4.1: Unmetered load in South Australia

LOAD	APPROX. GWH CONSUMPTION	PROPORTION OF UN- METERED DE- MAND	PROPORTION OF NON-MAR- KET UN- METERED DE- MAND	PROPORTION OF TOTAL SOUTH AUS- TRALIAN DE- MAND
Street lights (Type 7)	102.9	80.7%	-	0.94%
Traffic lights (Type 7)	3.4	2.7%	-	0.03%
Flood lights	8.5	6.7%	40.2%	0.08%
Cable TV	5.2	4.1%	24.5%	0.05%
NBN cabinets	4.6	3.6%	21.7%	0.04%
Sprinkler/irrigat ion	0.7	0.6%	3.5%	0.01%
Phone cabinets	0.7	0.5%	3.2%	0.01%
Telstra CMUX	0.5	0.4%	2.6%	0.00%
Bus Shelters	0.3	0.3%	1.6%	0.00%
Parking Tickets	0.2	0.1%	0.9%	0.00%
Other	0.2	0.2%	1%	0.00%
Total unmetered supply	127.5	100%	-	1.16%
Total non- market unmetered supply	21.2	-	100%	0.19%
Total SA supply	11,000	-	-	100%

Source: South Australian Power Networks, private correspondence received 6 August 2018.

As Table 4.1 illustrates, non-market unmetered load contributes to 0.19 per cent of total electricity consumption in South Australia, of which telecommunications infrastructure make up almost 0.1 per cent.

Most DNSPs noted that there would be some significant practical issues and high costs associated with implementing AEMO's first option of making all non-market unmetered loads, type 7 metering installations.¹¹² For example, Ausgrid labelled this approach as tedious, noting it would not provide an efficient or cost effective outcome. Further, Ausgrid noted that

¹¹² Consultation paper submissions: Ausgrid, pp2-3; AusNet Services, p. 2; Jemena Electricity Networks, p.2.

because many of these loads are from older legacy equipment which is no longer manufactured, this approach would require this equipment to be removed, tested and reinstalled, which would dramatically increase costs.¹¹³ Jemena submitted that the benefit of expanding type 7 to include all unmetered loads would not exceed the regulatory and administrative burden it would impose.¹¹⁴

The two retailers that commented on unmetered loads considered that the most accurate option should be prioritised. AGL Energy noted that although it would be a significant task to gather an accurate inventory of unmetered loads, and establish profiles, it would be a valuable exercise to understand energy demand in the NEM.¹¹⁵ AGL Energy also suggested AEMO's second option would not be accurate and should only be considered a last resort.¹¹⁶ Similarly ERM Power noted that any errors in estimating calculations would be placed on all participants via UFE, and suggested careful consideration be placed on the methodology and that methodology be reviewed and tested.¹¹⁷

Ausgrid, AusNet Services and Energy Networks Australia suggested establishing a new metering class for non-market unmetered loads (e.g. 7A).¹¹⁸ Ausgrid suggested the new metering type would involve the Metering Coordinator and the customer agreeing on the proposed load and inventory table, and this data processed by the MDP and delivered for settlement.¹¹⁹ AusNet Services proposed a new metering type could be used with intelligent street lighting and smart city enablers to prevent the requirement of a NEM compliant meter being installed at each site.¹²⁰ Similarly, the ENA suggested a new metering type be introduced for small loads that would waive the requirement for full NEM compliant meters being installed.¹²¹

TasNetworks suggested they already have a process to submit non-market unmetered loads to the AEMO.¹²² However, this appears to be predominantly for type 7 metering devices.

4.4

Draft determination

4.4.1

Analysis

In the draft determination, the Commission explored the options for measuring non-market unmetered loads under global settlements, including assessing AEMO's two proposed options.

AEMO's option 1 - register unmetered loads as a type 7 metering installation

The Commission noted in the draft determination that this option may provide a relatively accurate solution for the measurement of unmetered loads that have predictable usage

¹¹³ Ausgrid, consultation paper submission, p. 3.

¹¹⁴ Jemena Electricity Networks, consultation paper submission, p. 2.

¹¹⁵ AGL Energy, consultation paper submission, p.2.

¹¹⁶ Ibid., p. 4.

¹¹⁷ ERM Power, Consultation paper submission, p. 3.

¹¹⁸ Consultation paper submissions: Ausgrid, pp. 2-3; AusNet Services, p.2; Energy Networks Australia, p.2.

¹¹⁹ Ausgrid, consultation paper submission, pp. 2-3.

¹²⁰ AusNet Services, consultation paper submission, p. 2.

¹²¹ Energy Networks Australia, consultation paper submission, p. 2.

¹²² TasNetworks, consultation paper submission, p. 2.

patterns because each type of load would have a relatively accurate estimate and calculation methodology developed. Once the load, inventory and calculation methods are established, this option would also be relatively easy to maintain with a straightforward process for adding new assets. Box 5 below explains some background to type 7 metering installations.

BOX 5: TYPE 7 METERING INSTALLATIONS

There are two established examples of type 7 metering installations:

1. **Street lighting** – Street lighting has defined on and off times for each day of a calendar year, based on sunrise and sunset. The luminaires used in street lighting undergo formal testing to determine the load values that can be used to calculate type 7 metering data. The distribution network service provider maintains inventory tables of each installed luminaire type. Using these critical data inputs, a simple algorithm can be used to calculate the interval metering data for each calendar day.
2. **Traffic lights** – The majority of traffic lights operate constantly, based on a predictable, short cycle. Once the load value for a traffic light can be determined through formal testing, and the number of traffic lights of that type are known, interval metering data can be calculated. In some cases traffic lighting is dimmed to a specific level, based on the sunrise and sunset timings, and the load value once dimmed can be determined through formal testing. As a result, dimmed traffic lighting can use one load value for the hours of daylight and another for the remainder of the 24 hours within a given day, and interval metering data can be calculated accordingly.

The process for establishing a new type 7 device is as follows:

1. The device must meet the following criteria stipulated in item 5(b) of table S7.4.3.1 of Schedule 7.4. of Chapter 7 of the NER:
 - a. load pattern is predictable
 - b. for the purpose of energy settlements the load pattern can be reasonably calculated by a relevant method set out in the metrology procedure
 - c. it would not be cost effective to meter the connection point taking into account the small magnitude of load, the connection arrangements and the geographical and physical location.
2. The registering party must then work with AEMO to ensure the device meets the relevant specifications. The registering party must provide AEMO with a load measurement test conducted by a National Association of Testing Authorities (NATA) accredited laboratory or an overseas equivalent.
3. If the device meets all relevant criteria, the proposal, accompanied by the load measurement test results, are then subject to public consultation.
4. If the new load does not meet any objections, and AEMO is satisfied it meets the requirements in the metrology procedures, it will approve the load and add it to the load table.

Further detail on the calculations for type 7 devices is available in the Metrology Procedures Part B section 12.

While this approach delivers a relatively accurate estimate of unmetered loads, it does have some significant practical challenges.

First, some of these loads would not be suitable to comply with type 7 requirements and would likely fail some of the requirements in the National Measurement Act. For example, if the load pattern is not predictable and varies constantly each day, the calculations for the calculated type 7 estimates could extend beyond acceptable margins of error.

Second, each of these loads would need to be assessed and undergo approval testing by the National Association of Testing Authorities (NATA) to assess the load size and consumption profile of the device. This could be burdensome and difficult to implement, due to the large variety of small devices that are distributed across distribution networks. Further, as highlighted by Ausgrid in their submission, there are many historic legacy devices (such as bus shelters and old public barbecues) that are no longer manufactured. These devices would need to be removed, tested sufficiently and then reinstalled, which may increase costs associated with this approach considerably.

AEMO's option 2 - Parties agree on an estimate of unmetered load

This option adopts a similar approach to the existing arrangements where the franchise customer, DNSP and FRMP negotiate an agreement about the approximate size and value of the unmetered load. Under this approach the load associated with the NMI would be processed through MSATS and subtracted from UFE, in a similar approach to type 7 loads.

Discussions with stakeholders suggest that most devices that have been installed in the past few years undergo some form of NATA testing, where the maximum consumption level is identified and generally used as the load size for calculating the value of the load charged to the franchise customer. This may overestimate the quantity of energy consumed by unmetered devices. Further, each DNSP may have a different approach for estimating the size of the unmetered load from the same device. To implement this approach effectively, AEMO would therefore need to update the metrology procedures and the unmetered load guidelines to establish more detail on the process for estimates.

The unmetered load would also need to be assigned a profile. As noted above, according to stakeholders DNSPs generally assume the unmetered device is consuming the maximum load at all times to be conservative. While a conservative estimate for planning infrastructure decisions, this assumption may lead to overestimates that would be included in settlements. Under this option, AEMO in consultation with stakeholders would therefore need to set out options for profiling. These could include:

- a flat profile set at an appropriate level
- the relevant NSLP/Manually Read Interval Meter data profile
- an equipment-specific profile supported by NATA testing and evidence.

This approach, while less accurate than option 1, would provide a relatively less complicated approach to deal with unmetered load. AEMO would produce guidelines for estimating load, and verify the size and profile of the load with the franchise customer, DNSP and retailers to ensure the estimate is approximately correct and consistent across the NEM.

Establishing a new type of metering installation

Several of the consultation paper submissions suggested that a new metering installation type be established to support non-market unmetered loads that do not meet the requirements of type 7. This new metering type could be more dynamic in how it accounts for energy usage, for example using smaller meters that do not have a physical display or using supervisory control and data acquisition (SCADA) or another form of energy metering that does not comply with the current rules.

The development of this new metering type, while worth considering as a solution to broader questions relating to the metering of small loads in the medium term, would be a disproportionately complex and costly change simply to accommodate non-market, unmetered loads under global settlement.

4.4.2 Commission's position in the draft determination

In the draft determination, the Commission concluded that non-market unmetered loads need to be removed from UFE under a global settlements framework.

Ideally, it would be most accurate to make all non-market unmetered loads type 7 metering installations. However, this is not possible because not all types of unmetered loads meet the predictability requirements to be type 7 loads. Furthermore, it would be administratively burdensome, impractical, and the costs associated with such a change would likely outweigh the benefits. The option suggested by the DNSPs of creating a new metering type (e.g. 7A), while potentially worth pursuing in the medium term, is a relatively costly and complicated solution.

The Commission therefore considered AEMO's option 2 to be the most viable option. This option provides a simple and straightforward means to account for unmetered loads through settlement. For those loads that have an element of predictability, the Commission suggested that AEMO should work with participants to assist with the development of additional type 7 categories where appropriate. The Commission also noted that future considerations should be made on the development of an additional metrology category.

4.4.3 Implementation in the draft rule

The Commission stated in the draft determination that to implement the Commission's draft rule in relation to the treatment of non-market unmetered loads, several changes would need to be made to the current arrangements.

- First, AEMO will need to develop and update the metrology procedure and unmetered load guidelines.
- Second, DNSPs, MDPs and other relevant parties will need to work with AEMO to ensure the estimates of unmetered loads are calculated in accordance with the metrology

procedures and guidelines. This would involve allocating non-market unmetered loads to a specific NMI, ensuring load and profile estimates are in accordance with AEMO's procedures and that the unmetered inventory tables are accurate.

- Finally, once established, MDPs will need to provide the estimated data to AEMO for settlement.

The draft rule therefore introduced a requirement on AEMO to include in its metrology procedures guidance for the inclusion of non-market unmetered load in settlement including: the creation of NMIs for non-market unmetered load; the assignment of connection points relating to unmetered non-market load to a single TNI or VTN; and the methodology for calculating load and a load profile for non-market unmetered load.

The Commission noted in the draft determination that there will be an important balance between flexibility and prescription in the guidance that AEMO provides. While improvements can be made to the accuracy of the current arrangements and this will be important for settlements, the small magnitude of these loads means AEMO will need to carefully balance whether such improvements are outweighed by the costs of calculating estimates.

4.5 Submissions on the draft determination

Stakeholders generally supported the Commission's proposed treatment of unmetered loads. However, there were several issues raised about how this approach should be implemented.

Several submissions suggested some discretion should be applied to the treatment of different types of unmetered loads. Plus ES noted it supported the inclusion of non-market unmetered loads into settlement, however suggested the process used to measure the size of these loads should be commensurate with their estimated volumes.¹²³ AGL Energy suggested a framework be established for the management of unmetered supplies, potentially involving load bands determining when supplies should be metered, when devices are used to record load profiles, and how NMI allocations are used. AGL Energy suggested this should be industry-led as AEMO has not dealt with unmetered loads in the past.¹²⁴ EnergyAustralia also suggested segmenting the treatment of different unmetered loads, proposing: street and traffic lights remain as type 7 metering installations; floodlights, cable TV and NBN cabinets should be considered for physical or alternative metering; all remaining maintain their current unmetered estimations.¹²⁵

CitiPower, Powercor and United Energy suggested the accuracy of measurement of franchise customer loads needs to be improved from the current approach, suggesting this could be done by including obligations for customers to notify distributors of any changes to their devices, mandating a rollout of small measurement devices (not meters) that measure load and profiles, and limiting the supply of future unmetered supplies to 6 amps.¹²⁶

¹²³ Plus ES, draft determination submission, p. 1.

¹²⁴ AGL, draft determination submission, pp. 3-4.

¹²⁵ EnergyAustralia, draft determination submission, pp. 2-3.

¹²⁶ CitiPower, Powercor, and United Energy, draft determination submission, p. 2.

TasNetworks noted while it supported the Commission's position on unmetered loads, it did not support the use of equipment to measure profiles of unmetered loads. Instead, it suggested a flat profile at the appropriate level be used as it would be more consistent to the current arrangements which preserves sufficient accuracy while avoiding costs and complexity.¹²⁷

4.6 Final determination and Commission's final position

Submissions to the draft determination generally focused on ensuring unmetered loads are treated appropriately in a manner which balances the load size, level of accuracy and implementation costs. As set out in the draft determination, the Commission considers the best way to allow for this discretionary treatment of different types of unmetered loads is to place the specifics of how these loads are calculated into AEMO's unmetered load guidelines and procedures. By giving AEMO discretion to determine these details the final rule provides the necessary flexibility to adapt to the range of circumstances of unmetered load supply.

In its submission to the draft determination, AGL Energy suggested that an industry-led process to develop this framework could be preferable to an AEMO-led process, as industry has more experience dealing with this type of load.¹²⁸ The Commission agrees that industry involvement, including that of franchise customers will be important in the unmetered load changes. However, the Commission considers that with the incorporation of non-market unmetered loads into settlement it is appropriate AEMO has oversight of such changes. Furthermore, the Commission considers the requirement in the final rule for AEMO to follow the rules consultation procedures when developing the guideline under the final rule appropriately incorporates industry engagement.

Therefore, the Commission's final rule maintains the position of the draft determination, which requires:

- unmetered loads to be processed through MSATS
- the load profile and size to be agreed upon by the customer, DNSP, retailer and AEMO in accordance with AEMO's updated metrology procedures and unmetered load guidelines
- AEMO to update their unmetered load guidelines and metrology procedures in accordance with the rules consultation procedures.

¹²⁷ TasNetworks, draft determination submission, p. 2.

¹²⁸ AGL Energy, draft determination submission, pp. 3-4.

5 VIRTUAL TRANSMISSION NODES

As discussed in Chapter 3, the Commission considers that implementing global settlement in such a way that UFE is calculated and allocated by AEMO for each distribution network local area, with the use of VTNs being retained for settlement purposes where this is agreed by the AER, will, or is likely to, contribute to the NEO. This chapter considers how VTNs should be treated under global settlement.

5.1 Issue

In the NEM, connection points to the transmission network are identified by Transmission Node Identifier Codes, or TNIs. This acronym is also commonly used to refer to the connection points themselves, e.g. "Ausgrid currently has...57 TNIs through the network".

One instance in which TNIs are used in the regulatory framework is in the specification of technical losses on the transmission network. These are accounted for through Marginal Loss Factors (MLFs). MLFs represent electrical losses between a TNI and the regional reference node for the region in which the TNI is located. AEMO is required to calculate MLFs on an annual basis.¹²⁹

Clause 3.6.2(b)(3) of the rules allows, with the agreement of the AER, for transmission network loss factors to be averaged over an adjacent group of transmission network connection points, or TNIs. If averaging is used, the relevant transmission network connection points will be collectively defined as a VTN. The MLF for the VTN is calculated as the volume weighted average of the transmission loss factors of the constituent TNIs. AEMO's *Forward-Looking Transmission Loss Factors Methodology* explains the specific method that is used.¹³⁰

One application of VTNs is to simplify the settlement process in situations where it is impractical to assign specific loads to a physical TNI. For example, in the case of the supply to customers being regularly switched between physical TNIs for operational reasons. The VTN in South Australia is used for a different purpose; it exists as part of the implementation of the state's 'country equalisation' policy. The instances in which VTNs are currently used in the NEM are shown in Table 5.1.

Table 5.1: Regional use of VTNs

REGION	VTN CODES	PURPOSE
New South Wales	NEV1, NEV2, NEV3	In New South Wales, VTNs apply only in the Ausgrid distribution area. They are used to simplify the application of MLFs for geographically dispersed Type 7 calculated and unmetered loads. Each VTN is used for (a) traffic lights; and (b) a legacy lighting program for 50 to

¹²⁹ NER, clause 3.6.2. In the rules, MLFs are referred to as intra-regional loss factors.

¹³⁰ AEMO, *Forward-Looking Transmission Loss Factors*, 8 February 2017, p. 18.

REGION	VTN CODES	PURPOSE
		60 business customers.
ACT	AAVT	The VTN applies to all ACT customers except for embedded generation, large customers and interstate transfers. It simplifies the application of MLFs by removing the need to map individual connection points to one of 12 TNIs. This is a practical solution given that the network covers a small geographical area and there is little variation in the MLFs of the constituent physical TNIs.
South Australia	SJP1	Under South Australia's 'country equalisation' policy,* the AER must "ensure that the prices charged to small customers for network services in relation to distribution services in the State are not subject to variation on the basis of location"*** when making a distribution determination or approving a pricing proposal. As part of this, the South Australian legislation requires the AER to determine any transmission loss factor using a single VTN for all small customers that has been calculated by the transmission network service provider.***
Tasmania	TVN1, TVN2	The VTNs apply to all customers in Hobart and Launceston except for large customers. They simplify the application of MLFs by removing the need to map individual connection points to TNIs, which may be changed regularly for operational reasons.

Note: *Electricity Pricing Order, see The South Australian Government Gazette, 5 December 2002, p. 4458. **National Electricity (South Australia) Act 1996, section 18(5)(a). ***Ibid., section 18(5)(c).

Under clause 3.15.3 of the rules, the entity that is financially responsible for a VTN is the market participant which is the local retailer for all the market connection points assigned to that VTN. The current process used to settle the customers assigned to VTNs is as follows:

- Each independent retailer who is responsible for one or more NMIs assigned to a VTN is *charged* on the basis of the DLF-adjusted, metered energy for the NMI, scaled by the MLF of the VTN.
- The local retailer for the VTN is *charged* on the basis of the total metered energy for each of the TNIs that constitute the VTN, in each case scaled by the MLF of the TNI.
- The local retailer for the VTN is *credited* on the basis of the total DLF-adjusted energy consumed for all NMIs associated with the VTN that are served by independent retailers, scaled by the MLF of the VTN.

AEMO's proposed rule deletes references to VTNs from the settlements process in chapter 3 of the NER. The issue that this creates is that the process described above, and VTNs currently in use, would cease to exist under the NER. By implication, an alternative process

(which could be an existing process) would be required to deal with the energy that is currently settled through the use of VTNs.

5.2 AEMO's view

AEMO's rule change request proposes to remove the local retailer role from the NER on the basis that the global settlement concept does not differentiate between retailers. This is reflected in the proposed rule, which removes the direct financial responsibility for VTNs from local retailers. Instead, under AEMO's proposal, global settlements would operate at the TNI level, with all NMIs assigned to a physical connection point. There would be no spot market transactions or FRMP for a VTN.

After the rule change request was received, the Commission requested that AEMO develop options for the treatment of VTNs under global settlement for the purpose of consultation. These are set out in Table 5.2.

The options have different cost implications for AEMO and DNSPs. Depending on the option which is chosen, DNSPs may incur:

- a once-off cost associated with 'mapping' existing VTN customer meters to a TNI so that costs could be attributed to each NMI
- increased on-going costs to assign all customer meters to a TNI.

Table 5.2: Potential options for the treatment of VTNs under global settlement

OPTION	EFFECTS
<p>1. Retain VTNs and:</p> <ul style="list-style-type: none"> • settle at the TNI level • allow the energy associated with VTN NMIs to become UFE and be allocated to the physical TNIs that make up the VTN. 	<ul style="list-style-type: none"> • No change to VTN policy arrangements. • UFE would be calculated and allocated for each TNI. • The metered energy for VTN NMIs would be part of UFE. The UFE would be apportioned across the non-VTN NMIs connected to the physical TNIs that make up the VTN. This distortion would lead to customer prices not being cost reflective.
<p>2. Remove VTNs and:</p> <ul style="list-style-type: none"> • maintain settlement at the TNI level • require the physical TNI to be used instead of the VTN. 	<ul style="list-style-type: none"> • AEMO's proposed UFE methodology could be implemented, with the UFE being calculated and allocated for each TNI. • DNSPs would need to attribute each VTN NMI to a physical TNI (once-off cost). • Jurisdictions may wish to retain the existing arrangements in regard to VTNs.
<p>3. Retain VTNs and:</p> <ul style="list-style-type: none"> • maintain settlement at the TNI level 	<ul style="list-style-type: none"> • No change to VTN policy arrangements. • The proposed UFE methodology could be implemented, with the UFE being calculated for each TNI.

OPTION	EFFECTS
<ul style="list-style-type: none"> enable this option by updating AEMO's systems to split the TNI field in MSATS into two so that one field is the physical TNI (location) and the other is the MLF (or VTN MLF). 	<ul style="list-style-type: none"> AEMO's retail and wholesale systems would need to be changed to allow a separate MLF code to be stored and used. DNSPs would need to attribute each VTN NMI to a physical TNI (once-off cost).
<p>4. Retain VTNs and:</p> <ul style="list-style-type: none"> maintain settlement at the TNI level enable this option by updating AEMO's systems to create additional VTN codes in MSATS for each combination of VTN and TNI. Does not require an additional field. 	<ul style="list-style-type: none"> No change to VTN policy arrangements. The proposed UFE methodology could be implemented, with the UFE being calculated for each TNI. Requires AEMO to create additional "dummy" VTNs and link them to physical TNIs using a look-up table. Would involve a significant update of MSATS standing data. DNSPs would need to attribute each VTN NMI to a "dummy" VTN, reflecting the physical TNI (once-off cost).
<p>5. Retain VTNs and:</p> <ul style="list-style-type: none"> calculate UFE at the local area level. 	<ul style="list-style-type: none"> No change to VTN policy arrangements. UFE would be calculated and allocated for each local area Requires lesser changes to AEMO's and DNSPs' systems than other options. This option provides a more level playing field than 'settlement by difference', however it is less cost reflective than options 2, 3, and 4 where settlement occurs at the TNI level.

5.3 Stakeholder views

AGL Energy, Ausgrid, ENA, PLUS ES, TasNetworks and the South Australian Government all supported the continued use of VTNs.¹³¹

AGL Energy considered that there should be minimal changes to the arrangements for VTNs and therefore supported option 3 (in Table 5.2).¹³² The ENA indicated that among its members, strongest support was shown for options 4 and 5.¹³³

¹³¹ Consultation paper submissions: AGL Energy, p. 5; Ausgrid, p. 4; Energy Networks Australia, p. 2; PLUS ES, p. 2; South Australian Government, p. 1; TasNetworks, p.2.

¹³² AGL Energy, consultation paper submission, p. 5.

¹³³ Energy Networks Australia, consultation paper submission, p. 2.

Ausgrid, PLUS ES and TasNetworks provided further information on how VTNs are currently used and the implications of their potential removal. Ausgrid submitted that VTNs are an effective method for managing aggregated Type 7 NMIs where more precise allocation would be difficult or expensive for customers.¹³⁴ PLUS ES, a provider of metering data services to Ausgrid for its type 6 and 7 metering installations, considered that there would need to be some form of aggregation as it is not practical to have, for example, a remotely located bus shelter with one light attracting its own NMI.¹³⁵

TasNetworks advised that it uses two VTNs for all customers, excluding transmission connected customers, in Hobart and Launceston. These customers are, respectively, served by seven and six transmission substations.¹³⁶ TasNetworks explained that the network switches associated with changes to Hydro Tasmania's generation profile, planned network outages or network faults can result in tens of thousands of customers changing TNI. It noted that it would be difficult to keep MSATS up to date since:

- there is currently no facility to make automated, bulk updates to MSATS
- there are presently no links between TasNetworks systems that contain customer information and those that facilitate network control. This is because such links have not been required due to the use of VTNs.

TasNetworks considered that a bespoke solution would likely require significant up front capital expenditure and ongoing operational expenditure to support. Therefore, TasNetworks' preference is for a derogation to keep the existing VTN arrangements in place, or for AEMO's option 5 to be used.

The South Australian Government noted that the use of VTNs is mandated in the NEL. Section 18 further requires the AER to use a single VTN for all small customers in South Australia in its pricing decisions. These requirements were put in place in line with South Australia's 'country equalisation scheme'.¹³⁷

5.4 Draft determination

Submitters provided a range of examples in which VTNs provide a cost effective solution to technical or policy challenges that would likely be difficult or costly to address by other means. It is notable that while the policy objectives of VTNs are separate to those of global settlements, there will still be situations under global settlements where using VTNs to average transmission loss factors will be an efficient course of action. For these reasons, the Commission considered that VTNs should be retained as a feature of the regulatory framework under global settlement.

As discussed in Chapter 3, the Commission's draft rule involved allocating UFE to retailers based on their 'accounted for' energy across each local area. This is most consistent with Option 5 in Table 5.2 – there is no change to the VTN policy arrangements and UFE is

¹³⁴ Ausgrid, consultation paper submission, pp. 3-4.

¹³⁵ PLUS ES, consultation paper submission, p. 2.

¹³⁶ TasNetworks, consultation paper submission, p.2.

¹³⁷ South Australian Government, consultation paper submission, p. 2.

allocated at the local area level. The Commission considered in its draft determination that this option most easily accommodated the continued use of VTNs into the future. The Commission stated that this option is more preferable than option 1 because it allows for the energy associated with the VTN NMIs to be properly accounted for in settlement, rather than being allocated to all retailers as UFE.

The other central component of the Commission's draft rule was a requirement for AEMO to calculate the volume of UFE for each TNI. The Commission found that there would likely be material benefits from AEMO doing this calculation and providing this information to the market. To accurately calculate UFE, AEMO would need to know which TNI every customer allocated to a VTN is physically connected to. This information will assist in the identification of sources of UFE, potentially resulting in UFE being reduced over time. Hence, the draft rule contained a requirement on DNSPs using VTNs to provide this information, the NMI-to-TNI 'mapping' for VTN customers, to AEMO. Consistent with c. 3.6.3 of the rules, the mapping exercise should take into account normal network configurations and predominant load flows.

AEMO indicated that it would need to make system changes to MSATS to accommodate this extra information; options 3 and 4 above are two possibilities for how this could be done. The Commission considered in its draft determination that it would be most appropriate for this detail to be determined by AEMO in its relevant procedures during the implementation process rather than being specified in the rules. The Commission stated that it expected AEMO to determine the most effective option during the implementation process and for this to be specified in the relevant procedure.

While the Commission expected there to be material benefits from AEMO being able to accurately calculate UFE levels for each TNI, it also acknowledged that it may not always be practical or cost-effective for DNSPs to provide the NMI-to-TNI 'mapping'. For example, TasNetworks explained that it regularly switches tens of thousands of Hobart and Launceston customers between TNIs. To provide flexibility in situations such as this, the draft rule offers DNSPs the ability to request an exemption from providing this information.

Under the draft rule, AEMO could exempt a DNSP from the requirement to provide the NMI-to-TNI 'mapping' where (in AEMO's reasonable opinion) the exemption is not inconsistent with the NEO. AEMO may take into account:

- the effort and costs that would be incurred by the DNSP to comply with the requirement
- the volume of energy associated with the VTN relative to the total energy in the local area in which the VTN is being used
- the amount of UFE in the local area in which the VTN is being used
- the level of retail competition in the local area in which the VTN is being used
- any other conditions AEMO considers appropriate.

The draft rule allowed AEMO to revoke an exemption if there has been a material change in circumstances and in AEMO's reasonable opinion the exemption is no longer justified. The Commission considered that this process would enable AEMO to strike a reasonable balance between collecting information that will have a material impact on the accuracy of its UFE

calculations for each TNI, without creating a disproportionate administrative burden for the affected DNSPs.

In instances where AEMO had granted an exemption from providing the NMI-to-TNI 'mapping', AEMO would be required to calculate and publish UFE volumes for the VTN rather than individually for its constituent physical TNIs.

5.5 Submissions on the draft determination

AGL Energy, Aurora Energy, ENA, PLUS ES and TasNetworks all supported the continued use of VTNs.¹³⁸

For example, TasNetwork considered that the use of VTNs in Tasmania is an elegant, simple and cost effective solution for overcoming settlement issues associated with the Tasmanian power system. It considers that it is not possible for TasNetworks to perform TNI to NMI mapping owing to meshed network areas being able to be supplied from multiple injection points which can change on a daily basis. As such, the removal of VTNs would result in significant financial impost to TasNetworks by forcing additional system upgrades so that MSATS reporting obligations could continue to be met.¹³⁹

5.6 Final determination

The Commission continues to consider that VTNs should be retained under the regulatory framework for global settlement because their use provides an effective solution to technical and policy challenges. Stakeholders unanimously supported this position in the draft determination.

As explained in chapter 3, the final rule does not require DNSPs to map NMIs to TNIs within VTNs, as was required under the draft rule. DNSPs will therefore only be required to allocate NMIs to a TNI or VTN (in the same way they do under the current arrangements). In addition, and as described in chapter 3, the Commission has introduced an AEMO UFE reporting framework in the final rule. Under this framework, AEMO may seek further information from DNSPs at a more granular level (e.g. TNI that a NMI is associated with within a VTN) to highlight and investigate causes of UFE.

¹³⁸ Draft determination submissions: AGL Energy, p. 3; Aurora Energy, p. 2; Energy Networks Australia, p. 1; PLUS ES, p. 1; TasNetworks, p.2.

¹³⁹ Draft determination submissions: TasNetworks, p.2.

6 OTHER DESIGN CONSIDERATIONS

This chapter explores some additional design elements that need to be considered for the implementation of global settlements, including the treatment of:

- non-market generators
- embedded networks
- metering at transmission connection points
- metering at cross boundaries between distribution networks.

6.1 Non-market generators

Clause 2.2.5(a) of the rules, which applies to generating units that are required to be registered with AEMO, states that a generating unit whose sent out generation is purchased in its entirety by the local retailer, or by a customer located at the same connection point, must be classified as a non-market generating unit.¹⁴⁰ Further, cl. 2.2.5(c) specifies that a non-market generator is not entitled to receive payment from AEMO for sent-out generation except for any compensation that may be payable to it under the rules as a result of a direction issued by AEMO. Instead, non-market generators receive income via bilateral agreements with either the local retailer or a customer at the same connection point. An example of a non-market generator is a sugar mill that sells electricity to the local retailer, in a relationship akin to a power purchase agreement.

Non-market generators can be non-scheduled, semi scheduled or scheduled, however all of the currently installed non-market generators are non-scheduled. The table below shows the 17 non-market generators currently registered in the NEM.

Table 6.1: Non-market generators currently registered in the NEM

PARTICIPANT	STATION NAME	REGION	FUEL SOURCE	MAX CAPACITY (MW)
AGL Hydro Partnership	Rubicon Mountain Streams Station	VIC	Hydro	13
CS Energy Limited	Callide Power Station	QLD	Black coal	30
EDL Group Operations Pty Ltd	Berwick Power Plant	VIC	Landfill Methane gas	7
Landfill Operations Pty Ltd	Melbourne Regional Landfill	VIC	Landfill Methane gas	8.88
LMS Energy Pty Ltd	Eastern Creek 2 Gas Utilisation Facility	NSW	Landfill Methane gas	10

¹⁴⁰ AEMO's interpretation of these clauses is set out in section 3.6. of AEMO, *Guide to Generator Exemptions & Classification of Generating Units*, 20 March 2018.

PARTICIPANT	STATION NAME	REGION	FUEL SOURCE	MAX CAPACITY (MW)
Mackay Sugar Limited	Racecourse Mill Power Station (unit 1, unit 2, unit 3)	QLD	Bagasse (sugar cane)	48
Pacific Hydro Chalicum Hills Pty Ltd	Chalicum Hills Wind Farm	VIC	Wind	53
Pacific Hydro Portland Wind Farm Pty Ltd	Portland Wind Farm	VIC	Wind	148
Pioneer Sugar Mills Pty Ltd	Pioneer Sugar Mill (unit 1, unit 2)	QLD	Bagasse (sugar cane)	68
Snowy Hydro Limited	Jindabyne Pump At Guthega	VIC	Hydro	70
Synergen Power Pty Limited	Snuggery Power Station	SA	Diesel	21
Tasmanian Irrigation Pty Ltd	Midlands Power Station	TAS	Hydro	7
Wilmar Sugar Pty Ltd	Victoria Mill (unit 3, unit 4)	QLD	Bagasse (sugar cane)	24

Source: AEMO, *NEM Registration and Exemption List*, accessed August 2018.

The key point of difference between market and non-market generators is their exposure to the NEM wholesale market. As non-market generators have all their generation output purchased by either the local retailer, or a customer at the same connection point, there is no exposure to the spot price, nor are they required to pay market fees or meet prudential requirements. In contrast, market generators are exposed to the spot market and must sell all their energy into the spot market (and pay for any energy they consume at the same connection point through the spot market).

AEMO's design for global settlement removed the role of the local retailer from the settlements process. It proposed that the arrangement for non-market generators be extended from the local retailer to all market customers, as long as the generation does not exceed the sum of the market customer's market loads within the local area. As discussed in chapter 2, the Commission's draft rule did not remove the local retailer from the NER. However, even if the role of the local retailer remains, as non-market generators are not currently processed through MSATS, any generation they export from their connection point will need to be treated appropriately to ensure that their generation is not counted as UFE.

6.1.1

AEMO's view

AEMO suggested two options for the treatment of non-market generation that would otherwise have been purchased by the local retailer:¹⁴¹

- Option 1 — Require non-market generators to reclassify as market generators if their output exceeds the load at the same connection point. This is the current policy for energy purchased from non-market generators by customers other than the local retailer. This would most likely require a transitional arrangement for existing non-market generation purchased by the local retailer. The transitional arrangement could look like option 2.
- Option 2 — Extend the current local retailer arrangement to all retailers, by allowing the output of non-market generators to be purchased by (and assigned in MSATS to) any market customer as long as the sent-out generation purchased from all non-market generators units in the local area will not exceed the sum of the market customer's market loads within the same local area.

6.1.2

Stakeholder views

Of the 19 submissions to the consultation paper, four submissions commented on the treatment of non-market generators. AGL Energy suggested that if the non-market generators are appropriately metered, there should be no impact on UFE, and therefore no specific action would be required.¹⁴² Energy Queensland suggested that if global settlements were to be adopted, non-market arrangements should be extended to all market customers.¹⁴³ Energy Consumers Australia stated that the treatment of distributed energy resources should be considered as part of the overall issues for orchestrating and considering the value streams from DER.¹⁴⁴

In their submission to the consultation paper, AEMO reiterated the two options suggested in the rule change proposal. They also noted that the implications of these options extend beyond global settlement, and therefore the option with the least impact to the participation of distributed generation should be adopted. AEMO suggested that option 2 is the most appropriate transition arrangement for the implementation of global settlement.¹⁴⁵

6.1.3

Analysis

Both of the options proposed by AEMO would only affect non-market generators that export electricity to the grid. Non-market generators that sell all their output to a customer at the same connection point would not be affected by these changes as there is no electricity exported beyond the connection point under normal conditions.

The Commission's consideration of the two options identified by AEMO is set out below.

¹⁴¹ AEMO, consultation submission, p. 3.

¹⁴² AGL Energy, consultation paper submission, p. 7.

¹⁴³ Energy Queensland, consultation paper submission, p. 2.

¹⁴⁴ Energy Consumers Australia, consultation paper submission, p. 4.

¹⁴⁵ AEMO, consultation paper submission, p. 3.

Option 1 – Require reclassification if output exceeds load at same connection point

As the non-market generator classification provides an avenue for these generators to sell energy under reduced regulatory obligations under the rules, this option would likely add a considerable compliance and regulatory burden to existing non-market generators that are net exporting from their connection point. As market generators, these units, that in most cases are relatively small generators, would be required to pay AEMO's fees and settle through the wholesale market. A benefit of this approach would be their generation would become contestable and they could contract their output with any counterparty, not just the local retailer. However, this option is already available to non-market generators if they reclassify as market generators.

The Commission does not support this option as it would impose a regulatory burden on non-market generators that is not justified for the purpose of implementing global settlement when less disruptive options are available.

Option 2 – Extend non-market generator classification to apply to any market customer whose non-market generation does not exceed its load in a local area

This option would allow non-market generators to maintain similar arrangements to their current situation, while also allowing non-market generators to contract with any retailer with sufficient load in the network area. This could have some positive impacts for retail competition as it would allow retailers with growing market share in a particular network region to vertically integrate the generation to cover part of its load. However, this option would also involve some additional monitoring by AEMO to ensure each retailer's load exceeds its non-market generation for each local area.

The Commission supports AEMO's suggestion in option 2 that generation output from non-market generators should be explicitly recognised in MSATS. The output of non-market generators that are net-exporters from their connection point needs to be accounted for by AEMO so that it does not become part of UFE. However, the Commission does not support the proposed change to extend the current arrangement to all market customers. As the energy exported by non-market generators would need to be settled through MSATS under global settlement, the distinction between market and non-market generators becomes less. In this context, the rationale for non-market generators that are net exporters being exempt from paying market fees and facing other regulatory obligations is also reduced. Hence, it would not be justified to expand this arrangement to all market customers.

Under global settlement, the convenience that was created by a non-market generator dealing directly with the local retailer falls away, since the metering data from the generation output needs to be processed through MSATS. The Commission considered that it is no longer desirable for the non-market generator classification to be open to generating units who sell the entirety of their generated output to the local retailer. Under such an arrangement, some participants would be afforded a reduced regulatory responsibility, without a commensurate benefit for the market. The draft rule therefore amended clause 2.2.5(a) to remove this option for new entrants, but grandfathered the existing arrangements for existing non-market generators that sell all their generation output to the local retailer.

6.1.4

Draft determination

The Commission's position in the draft determination was for:

- Existing non-market generators that export electricity beyond their connection point to be explicitly settled through MSATS. The local retailer would be assigned indefinitely as the FRMP and be allocated all spot market revenues for the energy sent-out by the non-market generators.
- The provisions for registering as a non-market generator to be changed from the commencement date of the rule, so that a generating unit can only be registered as a non-market generating unit if the entirety of its generation is purchased by a customer located at the same connection point. A generating unit that wants to sell its output to a market customer must become a registered participant (e.g. market generator, or market small generator aggregator), or operate via an intermediary who is a registered participant.
- Existing non-market generators that sell all their sent-out generation to the local retailer currently will continue to be eligible for the non-market generator classification through transitional provisions in the draft rule.

This approach allowed the existing non-market generators to continue operating as they currently do under settlement by difference. As the local retailer will now be the FRMP for any connection points to which that generator is connected, and will be paid for any sent-out generation which exceeds load at a relevant connection point, there will be visibility of the generator's output in MSATS and it will not be reflected as UFE.

6.1.5

Submissions on the draft determination

PLUS ES,¹⁴⁶ Energy Queensland,¹⁴⁷ AGL Energy¹⁴⁸ and Origin Energy¹⁴⁹ supported the policy positions for the treatment of non-market generators in the draft determination. There were no submissions that did not support the draft determination in respect of non-market generators.

AGL Energy notes that there are generation units producing supply for their own use most of the time (e.g. factories, hospitals) and there will be times when there is excess generation e.g. summer shutdowns, plant maintenance. Under this proposal, this generation would not be available to the market, unless the generator is registered. AGL Energy suggests that, provided the metering is adequate, the FRMP could be accountable for these exports so that supply is available to the market.¹⁵⁰

Origin Energy is concerned that there could be confusion that smaller DER systems could be captured under the non-market generator definition. The Rules should point to the relevant AEMO guideline that specifies a 5 MW threshold for non-market generators.¹⁵¹

¹⁴⁶ PLUS ES, draft determination submission, p. 1.

¹⁴⁷ Queensland Energy, draft determination submission, p. 6.

¹⁴⁸ AGL, draft determination submission, p. 4.

¹⁴⁹ OriginEnergy, draft determination submission, p. 1.

¹⁵⁰ AGL, draft determination submission, p. 4.

¹⁵¹ OriginEnergy, draft determination submission, p. 1.

6.1.6

Final determination

The Commission is of the view that the policy positions in the draft determination should be applied and these positions have been adopted in the final rule. The final rule is slightly different to the draft rule in order to make it clear that going forward and unless exempt from registration, a generating unit can no longer be classified as non-market if any of its generation will be exported beyond its connection point to the market.

The final rule therefore provides that a generating unit whose entire output is consumed by market load at the same connection point, and where there is never expected to be any sent out generation (i.e. generation exported to the distribution or transmission network) at that connection point, must be classified as a non-market generating unit.

The final rule continues to grandfather arrangements for existing non-market generators.

The Commission notes the concerns of AGL Energy and Origin Energy. In particular:

- The final rule would allow existing non-market generators that sell all their generation output to the current local retailer would be able to continue to be eligible for the non-market generator classification. However, the Commission considers that all future generating units that export into the grid should be registered as market generators as to do otherwise would treat them differently to other market generating units that also export into the grid.
- The classification of non-market generator only applies to generators that are required to be registered to AEMO under the rules (currently generating units above 5MW). DER are generally well below this threshold and therefore are not impacted by the final rule.

6.2

Embedded networks

Embedded networks are private electricity networks which serve multiple customers and are connected to another distribution or transmission system through a parent connection point. A party other than the registered LNSP owns and operates the private electricity network that customers connect to.

Common examples of embedded networks include shopping centres, retirement villages, apartment complexes and caravan parks. Embedded networks may occur as new developments or retrofits of existing buildings. Within embedded networks, customers can either be on-market or off-market. On-market customers are supplied by authorised retailers and their metering services (including installation, maintenance and meter reading) are provided by accredited providers. These customers' metering data is provided to AEMO and they are settled through MSATS. Off-market customers are supplied by exempt retailers. Their metering services are not required to be provided by accredited providers and they are not visible to the market.

For the purposes of settlements, within an embedded network an additional settlement by difference calculation is undertaken for on-market child connection points prior to settlements occurring. This involves MSATS netting off on-market child customers' load from the parent connection point load. The parent connection point retailer therefore pays for the total load of the embedded network minus any on-market child customers' load. An example of an

embedded network configuration with four stylised customers, four retailers and load is provided in Figure 6.1 below. The extra step in settlements at the parent connection point is also set out in Table 6.2.

As displayed in Figure 6.1, the off-market child connection points are not visible within settlements. They are therefore accounted for via the parent connection point. In this example, 32,000 kWh is allocated to the parent connection point (Customer 1), calculated through the additional settlement by difference calculation. The 32,000 kWh consists of the consumption by all of the off-market child connection points, and any other loads that the might be located within the embedded network (e.g. lighting, water chillers).

Figure 6.1: Embedded network configuration and settlements example

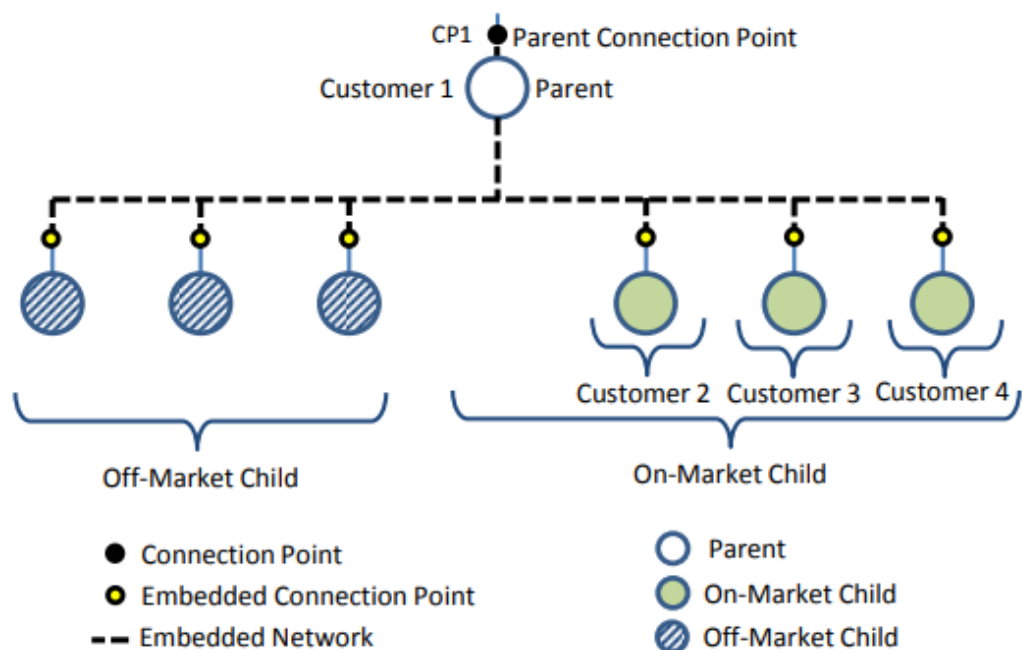


Table 6.2: Embedded network configuration and settlements example

CUSTOMER	RETAILER	METERED LOAD (KWH)	SETTLEMENT LOAD (KWH)
Customer 1	Retailer A	50,000	= 50,000 – 5,000 – 6,000 – 7,000 = 32,000
Customer 2	Retailer B	5,000	5,000
Customer 3	Retailer C	6,000	6,000
Customer 4	Retailer D	7,000	7,000

Note: Settlement load refers to the energy volume used for settlement. It has not yet been adjusted for technical losses (i.e. DLF).

The retailers at both the parent and on-market child connection points do not currently pay UFE unless they are the local retailer.

6.2.1

AEMO's view

AEMO stated in its rule change request that global settlements cannot be applied to embedded networks. This is because only the parent connection point and the on-market child connection points are recognised by the NER and, therefore, are the only connection points where metering data is available for use in settlement.

6.2.2

Stakeholder views

AGL Energy supported AEMO's proposal for embedded networks to continue to be settled under a settlement by difference approach.¹⁵² EnergyAustralia stressed the importance that care be taken in developing this rule change to preserve the ability of MDPs to be able to send on-market data to the retailer at the parent connection point.¹⁵³

6.2.3

Analysis

The proposed introduction of global settlements raises two questions for application to embedded networks:

1. Can embedded networks be settled under a global settlements framework or do they need to continue to utilise settlements by difference within the embedded network?
2. Should the retailers with on-market customers within embedded networks have that load included in their UFE allocation?

Currently, AEMO has no visibility of metering data for off-market child connection points. It is not practical to change this, because the metering services of off-market customers are not required to be provided by accredited providers. Therefore, in regard to the first question, settlements within embedded networks need to continue under the existing arrangements. That is, a separate settlements by difference calculation occurring within the embedded network to net off on-market child customer load against the parent connection point load. After this step has occurred, global settlements can then apply at the parent connection point and on-market child connection points.

Under this arrangement UFE will be allocated to the retailer(s) at on-market child connection points, because these loads are included in MSATS. The parent connection point retailer will be allocated UFE on the basis of the parent connection point load after the on-market child connection point load has been netted off. The Commission considers that this will provide efficient incentives to all parties within embedded networks regarding UFE. Retailers of on-market child customers will be incentivised to resolve UFE for that connection point because they will be paying UFE. Parent connection point retailers, and through them, embedded network service providers (e.g. shopping centre owners) will be incentivised to reduce UFE within the embedded network because they will be paying UFE.

¹⁵² AGL Energy, consultation paper submission, p. 5.

¹⁵³ EnergyAustralia, consultation paper submission, p. 3.

6.2.4 **Draft determination**

The Commission's view in the draft determination was that under global settlements, embedded networks should continue to be settled using settlements by difference within the network. This is because the current requirements for off-market meters are not suitable for global settlements. Additionally, the Commission's position was that UFE be allocated directly to the retailers of on-market customers, while the parent retailers will be allocated UFE for off-market customers.

6.2.5 **Submissions on the draft determination**

Energy Queensland was the only party that commented on the embedded networks position in the draft determination. It supported the Commission's proposed approach.¹⁵⁴

6.2.6 **Final determination**

The Commission's position on the treatment of embedded networks under global settlements is unchanged from the draft determination.

6.3 **Transmission connection point metering**

The rules assign responsibility for metering at the transmission connection point to the connection point's FRMP. Under these obligations, the FRMP either must contract the Transmission Network Service Provider (TNSP), as the Local Network Service Provider (LNSP), to act as Metering Coordinator (MC), or the FRMP must act as MC.

For the metering between the transmission and distribution networks, the FRMP is the local retailer of the DNSP area. For example, AGL Energy is the FRMP for connection points between the Victorian transmission network and Jemena's distribution network area, where the TNSP (AusNet Services) is contracted by AGL Energy to perform the role of MC.

In its submission to the consultation paper, AEMO considered that because global settlement will remove the role of local retailer, local retailers' roles as the FRMP for the connection point will be disestablished. This role will need to be filled in order for an MC to be appointed for the connection points at the intersection of the transmission and distribution networks.

6.3.1 **AEMO's view**

AEMO did not raise the issue in its original rule change request, however in its consultation paper submission, AEMO proposed two potential solutions:

1. The TNSP, as the LNSP for the connection point, is nominated as the metering coordinator in the NER.
2. AEMO is tasked under the NER to appoint the metering coordinator. AEMO has a minor role in appointment of MDPs for interconnector metering installations in the NEM. AEMO's role could be extended to include nomination of the metering coordinator at these additional connection points.

¹⁵⁴ Energy Queensland, draft determination submission, p. 6.

AEMO also noted that the Commission will need to consider the method for TNSPs to recover their costs if option 1 is adopted. For option 2 to be viable, the restrictions on parties that can be appointed as metering coordinator for these connection points would need to be removed.

6.3.2

Stakeholder views

Due to the issue not being raised in the rule change request, only AusNet Services commented on it. AusNet did not express a preference for option one or two. It noted that because the implementation date for five minute settlement and global settlements is likely to be aligned, any changes to responsibility for appointing TNSP metering could risk a successful implementation of 5 minute settlements, unless those changes are made well in advance of 1 July 2021. AusNet suggested that if any changes were to occur for the responsibility of appointing TNSP metering, they should be made by 1 Dec 2019.¹⁵⁵

6.3.3

Draft determination

If AEMO were to appoint the metering coordinator at the transmission connection points, it would allow for additional competition between metering coordinators. However, the TNSP nominating the metering coordinator would result in several benefits, including:

- It provides continuity in provision of metering services, as TNSPs are operating as the metering coordinator for each of the affected connection points today.
- For the implementation of the five minute settlement rule change TNSPs will already be developing, and possibly implementing a program to convert these current metering installations to be capable of five-minute recording, collection and processing. Confidence in the ongoing management of these installations and the associated services is important.
- The meter connection point is often inside TNSPs infrastructure (e.g. substation), so anyone other than the TNSPs MDP would need to request permission to access the area.
- There is precedent in the NER for nomination of the LNSP as an exclusive provider of services for interconnector connection points, which are critical to settlement.

The Commission considered in the draft determination that the TNSP at the connection point should be the metering coordinator. To give effect to this, the draft rule specified that the LNSP be nominated as the metering coordinator for metering installations at points that connect a distribution network with a transmission network. The relevant LNSP for these metering installations is the TNSP.

6.3.4

Submissions on the draft determination

TasNetworks¹⁵⁶ and the ENA¹⁵⁷ supported the Commission's position in the draft determination.

¹⁵⁵ AusNet Services, consultation paper submission, p. 1.

¹⁵⁶ TasNetworks, draft determination submission, p. 2.

¹⁵⁷ Energy Networks Australia, draft determination submission, p. 3.

Energy Queensland suggested that the financial responsible market participant (FRMP) should appoint the metering coordinator for metering installations for connection points between a transmission network and a distribution network.

6.3.5

Final determination

The Commission remains of the view that the TNSP at the connection point should be the metering coordinator and the final rule specifies that the LNSP be nominated as the metering coordinator for metering installations at points that connect a distribution network with a transmission network.

In regard to EnergyQueensland's submission, the Commission notes that it is not possible for the FRMP to appoint the metering coordinator because under global settlements no one retailer would be responsible for the energy at the transmission connection and the role should be given to an independent party.

6.4

Distribution connection point metering

In some parts of the NEM, in addition to a connection with the transmission network, energy can also be transferred between the local areas of adjacent distribution networks. Under the current settlements by difference arrangements it is necessary to meter this energy transfer so that the energy is assigned to the correct distribution local area, and hence to the correct local retailer. Any unmetered energy that transfers from one local area to another would appear as an increase to the settlement costs of the local retailer for the first local area, while reducing the settlement costs of the local retailer for the second local area.

Currently the financially responsible market participants for these cross boundary connection points between adjacent local areas are the local retailers. This means that these local retailers are also responsible for appointing the metering coordinator for these cross boundary connection points.¹⁵⁸ Similar to the issue with metering coordinator appointments at the connection points between the transmission network and distribution network described above, these arrangements will need to change under global settlements because of the removal of the role of the local retailer.

This issue was not raised in the rule change request or discussed in the draft determination.

6.4.1

Submissions on the draft determination

In their joint submission, CitiPower, Powercor and United Energy also identified the need to appoint metering coordinators for the 66kV and 22kV loops connections between some of the Victoria distribution local areas. They also indicated that the 66kV sub-transmission loops are metered but that some of the 22 kV loops are not currently adequately metered and NEM compliant metering installations would be required before global settlements could commence.¹⁵⁹

¹⁵⁸ The Commission understands that cross boundary flows are more common between the distribution local areas in Victoria.

¹⁵⁹ CitiPower, Powercor and United Energy, draft determination submission, pp. 2-3.

CitiPower, Powercor and United Energy also suggested that the rules could be changed to allow the distribution businesses to be the metering coordinators for these metering installation, noting that currently a distribution network service provider can only be a metering coordinator for type 5, 6 and 7 metering installations.¹⁶⁰

Similarly, AGL Energy also identified the issue cross boundary flows in its submission.¹⁶¹ AGL Energy noted that the metering installations for these flows were provided by the associated LNSP/DNSP and did not believe it was appropriate for a retailer to be responsible for these metering installations. AGL Energy recommended that the metering provisions should be extended to allow the LNSP/DNSPs to provide these metering installations.

6.4.2

Final determination

The Commission agrees that, under global settlements, it will be important to meter these cross boundary energy flows between adjacent distribution local areas. Any unmetered energy that transfers from one local area to another would appear as positive UFE in the first local area and negative UFE in the second.

The Commission notes that the current arrangements for settlements by difference where the local retailers appoint the metering coordinators is no longer appropriate as no single retailer is financially responsible for the energy transfers at these connection points. Therefore, the Commission considers that the metering coordinator for metering installations for connection points joining adjacent distribution local areas should be jointly appointed by the associated DSNPs.

The Commission also notes the metering installation for energy flows between adjacent DNSP networks will be located in one of the associated DNSP's substations, with the location being determined when the connection between the networks is being negotiated. The DNSP will, therefore, need to manage the access to the metering installation and the associated risks to operation of its network required for maintenance, testing and replacement of the metering equipment. Therefore, in many instances it would be desirable for the DNSP to be the Metering Coordinator, but where the DNSP wishes to do so it could appoint the Metering Coordinator.

Therefore, the final rule:

- places an obligation on the DSNPs associated with a flow between adjacent DSNPs to jointly determine the appointment of the Metering Coordinator
- allows the DSNPs to be the metering coordinator for metering installations that measure flows between adjacent DNSP networks.

Under these arrangements, the Commission expects that the efficient costs incurred by the DSNPs when performing the Metering Coordinator role, or in engaging a Metering Coordinator, would be recovered as standard control services.

¹⁶⁰ Ibid.

¹⁶¹ AGL, draft determination submission, p. 7.

In addition to including arrangements in the final rule for the appointment of a Metering Coordinator for cross boundary energy flows between adjacent DNSP local areas, the Commission also amended the final rule to:

- account for these cross boundary flows in the calculation of UFE, described in clause 3.15.5(a)
- exclude these cross boundary flows from the allocation of the UFE, described in clause 3.15.5(c), so that UFE within a local area is only recovered from customers in that local area.

The Commission notes that a cross boundary energy flow between two adjacent local areas would be included in the calculation of the UFE for both adjacent local areas, with the cross boundary energy flow having the opposite sign in the two adjacent local areas.

7 IMPLEMENTATION PROCESS

This chapter considers the process through which the global settlement framework outlined in Chapters 3 to 6 should be implemented.

7.1 Issue

Under the NEL, the Commission must make a rule as soon as practicable after publishing its final rule determination. However, the Commission can make a rule that does not come into effect straight away. Therefore, the Commission can determine that the commencement date to implement global settlement can be at some point in the future in order to allow for a suitable transition period (i.e. to align with the implementation of five minute settlement).

7.2 AEMO's view

AEMO proposed that the IT system capability for global settlement should be developed in alignment with the design and build activities already under way for the introduction of five minute settlement on 1 July 2021.

It noted that the process and system changes required to support global settlement are similar to those required for five minute settlement and "considerable synergies" could be found by aligning the processes.¹⁶² Implementation activities, transition and market readiness for both projects would follow the same structure and format.¹⁶³

AEMO did not propose a commencement date for global settlements.

7.3 Stakeholder views on the consultation paper

There was considerable stakeholder support for aligning the implementation of global settlement with five minute settlement.¹⁶⁴ Generally, submitters saw alignment as the most sensible option that would keep costs to a minimum. The Australian Energy Council thought that aligning the implementation process could cause complications, but still indicated support for concurrent implementation to avoid greater costs.¹⁶⁵

AGL Energy noted that while the system development of global settlement and five minute settlement will be concurrent, the two changes do not necessarily need to commence at the same time. AGL Energy also suggested that global settlement reporting on UFE volumes could commence ahead of changes to settlements, noting that this could encourage action to minimise high levels of UFE.¹⁶⁶ AEMO proposed this as well, suggesting that settlement calculations under a global framework be performed for a period of time alongside the

¹⁶² AEMO, Rule change proposal, p. 3; AEMO, High level design, p. 15.

¹⁶³ AEMO, High level design, p. 15.

¹⁶⁴ Consultation paper submissions: Ausgrid, pp. 4-5; Australian Energy Council, p. 1; ERM Power, p. 4; Jemena, p. 1; Origin Energy, p. 1; PLUS ES, p. 3; TasNetworks, p. 3.

¹⁶⁵ Australian Energy Council, p. 1.

¹⁶⁶ AGL Energy, consultation paper submission, p. 6.

existing settlement processes. It considered that this would allow participants to understand the impact and work to resolve any major discrepancies.¹⁶⁷

One dissenting view came from Energy Queensland. It urged caution in aligning the changes on the basis that businesses may have already committed to project plans and resource allocation for the five minute settlement rule.¹⁶⁸

On the question of staging implementation by geographic area, three submitters indicated that they do not support this approach.¹⁶⁹ ERM Power thought that this approach would be costly and complex to implement.¹⁷⁰ AGL Energy considered there would be no need for staging as the changes will have already been tested and many retailers operate in multiple jurisdictions.¹⁷¹

7.4 Draft determination

AEMO and other submitters considered that the implementation of global settlement should be aligned with the design and build activities for five minute settlement. The key milestones specified in the five minute settlement final rule are:

- AEMO must have consulted and amended its relevant procedures, methodologies and guidelines by 1 December 2019
- five minute settlement will commence on Thursday, 1 July 2021.

It is expected that a test environment for five minute bidding and five minute settlement will be provided by AEMO for a period in the order of one year ahead of the commencement date.¹⁷²

The Commission noted that considerable synergies had been identified by AEMO on account of the global settlement changes relating to the same IT systems and processes that are to be amended in the course of implementing five minute settlement. Indeed, the Commission's final rule on five minute settlement specifies that AEMO must review and where necessary amend a total of 16 documents, including the Metrology Procedures and MSATS Procedures.¹⁷³

Stakeholders also identified that concurrent implementation would minimise their implementation costs. The Commission understands from discussions with retailers that a sizable proportion of their implementation costs arise from mobilising teams and employing new staff. Hence, synergies are possible from implementing global settlement at the same time. Conversely, a delayed implementation would increase costs because some mobilisation costs would be incurred a second time.

¹⁶⁷ AEMO, consultation paper submission, p. 2.

¹⁶⁸ Energy Queensland, consultation paper submission, p. 2.

¹⁶⁹ Consultation paper submissions: AGL Energy, p. 6; ERM Power, p. 4; PLUS ES, p. 3.

¹⁷⁰ Ibid.

¹⁷¹ Ibid.

¹⁷² AEMO, Slides presented at the 24 May 2018 five minute settlement information session.

¹⁷³ Ibid., p. 39.

It was also suggested that global settlement should be implemented at the same time to take advantage of the heightened industry focus around the five minute settlement implementation. The feedback also suggested that businesses processes are sufficiently flexible to accommodate the implementation of global settlement, despite the five minute settlement implementation project having already commenced.

For these reasons, the Commission considered that it would be beneficial for the design and build activities, as well as the commencement date, for the global settlement rule to be aligned with the commencement of the five minute settlement rule.

The draft rule therefore specified that global settlement would commence on 1 July 2021, which coincided with the start date of five minute settlement. This implementation period—just over two and a half years—was seen as sufficient to accommodate the necessary system change projects that some submitters identified. The design and testing work prior to this date will also be aligned, including the requirement for AEMO to have updated its procedures by 1 December 2019.

It was expected that this implementation timeframe would allow for AEMO to calculate and publish UFE data at the TNI resolution for around 12 months in advance of the rule commencing. To facilitate this 'soft start', the draft rule included transitional provisions for AEMO to be provided, from 1 July 2020, with NMI-to-TNI 'mapping' data from DNSPs using VTNs, and data on the estimated consumption of unmetered loads. The timeframes for implementing global settlements in accordance with the draft rule is illustrated in Table 7.1.

Table 7.1: Implementation timeframes from the draft determination

DATE	ACTION
1 July 2019	IEC finalise recommended changes to B2B procedures
1 December 2019	AEMO publish amended procedures
1 March 2020	DNSPs must allocate all connection points to a TNI and provide estimated volumes of non-market unmetered loads
1 July 2020	AEMO begin publishing UFE data
1 July 2021	Global settlement commences

7.5

Submissions on the draft determination

Submissions to the draft determination focussed on three key areas, namely:

- the timing for the Information Exchange Committee recommendations to be released
- the timing of the soft start
- the timing of the commencement of the rule.

Information exchange committee (IEC) requirements

In its submission to the draft determination, AGL Energy noted that in the draft determination the IEC is required to complete its recommendations six months prior to AEMO

finalising its updated procedures. However, AEMO's updated procedures may require further changes to B2B procedures, suggesting the transition could be better aligned.¹⁷⁴ A similar point was made by Red Energy/Lumo Energy in their submission, suggesting both the IEC recommendations and AEMO procedures be developed in parallel and released on 1 December 2019.¹⁷⁵

Soft start for global settlements

Stakeholders commented on both the length of the soft start and the timing of the soft start proposed in the draft rule.

Energy Queensland supported the idea of a soft start, as it allowed participants to understand and potentially reduce UFE before it is allocated.¹⁷⁶ CitiPower, Powercor and United Energy also supported a soft start but suggested reducing it to six months.¹⁷⁷ AEMO suggested a similar position, noting a soft start lead-in period of six months would be sufficient, as the 12 month period previously proposed by AEMO assumed UFE would be calculated and settled at the TNI level.¹⁷⁸

Some-DNSPs suggested there are issues with the proposed date of the soft start. AusNet Services suggested the requirement to incorporate unmetered loads into MSATS in the draft rule is "unnecessarily early to prepare for a 1 July 2021 implementation". AusNet Services considered that significant work would need to be undertaken to meet the requirement of the draft rule for unmetered load. Including both assigning and mapping NMIs to TNIs and estimating load at each connection point. AusNet considered that the short timeframes proposed to undertake this work would result in significantly higher implementation costs than necessary.¹⁷⁹ Similar concerns were raised by CitiPower, Powercor and United Energy.¹⁸⁰

AEMO also considered it unfeasible to commence the calculation and publication of UFE by 1 July 2020 under the proposed timeframe. Additionally, AEMO submitted that market participants agreed that the proposed timeframe would be impractical.¹⁸¹

Commencement of global settlements

Most submissions to the draft determination that commented on implementation agreed that the alignment of global settlement timing with that of five minute settlement would be beneficial. AEMO suggested there would be significant benefits from aligning the development and implementation of the five minute and global settlement. In particular, considerable test, deployment and management overheads would be common between the two projects.¹⁸² AGL Energy, Origin Energy and EnergyAustralia all reiterated their support for alignment with 5 minute settlement and a 1 July 2021 start date.¹⁸³

¹⁷⁴ AGL Energy, draft determination submission, p. 7.

¹⁷⁵ Red Energy/Lumo Energy, draft determination submission, p. 2.

¹⁷⁶ Energy Queensland, draft determination submission, p. 5.

¹⁷⁷ CitiPower, Powercor, United Energy, draft determination submission, p. 2.

¹⁷⁸ AEMO, draft determination submission, p. 4.

¹⁷⁹ AusNet Services, draft determination submission, p. 1.

¹⁸⁰ CitiPower, Powercor and United Energy, draft determination submission, p. 1.

¹⁸¹ AEMO, draft determination submission, pp. 3-4.

¹⁸² AEMO, draft determination submission, p. 3.

AGL Energy suggested that if the commencement of global settlement is not aligned with five minute settlements, it would result in substantial additional costs for project initiation, program management and recruitment of IT resources, and any risks of launching both changes on the same day can be mitigated through adequate project management and system testing.¹⁸⁴ TasNetworks supported the proposed timeframes in the draft determination, suggesting it allowed for the greatest implementation synergies to be captured while minimising administrative burden and unnecessary costs.¹⁸⁵ ENA suggested that without alignment, network service providers would implement a piecemeal approach to data provision with inevitable duplication of work, and therefore costs.¹⁸⁶

However, stakeholders raised concerns about risks of both systems going live on the same day. AEMO recommended the soft start for global settlements begin on the day five minute settlement goes live, with settlement for global settlements commencing on the first calendar quarter of 2022. CitiPower, Powercor and United Energy also suggested that distributors provide unmetered load data to AEMO by 1 July 2021, allowing 6 months of soft start to identify missing data and errors, before commencing global settlement on 1 January 2022.¹⁸⁷

Aurora Energy considered that aligning the start date with five minute settlement would create material implementation risks and suggested global settlements should only be introduced after five minute settlement has commenced.¹⁸⁸ Alinta Energy argued that this delay would allow sufficient time to gain market experience from five minute settlements, while allowing AEMO to calculate UFE data over an extended period of time.¹⁸⁹ Similarly, while recognising the benefits of implementing both projects together, Energy Queensland considered that time should be allocated to stabilise five minute settlements prior to the commencement of global settlements, suggesting that global settlement commence 1 July 2023.¹⁹⁰

7.6 Final determination

Based on submissions and the Commission's analysis there are four key priorities for the implementation schedule for global settlements:

1. Synchronise procedure, guideline, system and data provision changes with five minute settlement to minimise costs
2. Provide sufficient time to AEMO and participants to undertake procedure, guideline, system and data provision changes

¹⁸³ Draft determination submissions: AGL. p. 1; EnergyAustralia, p. 2; Origin Energy, p. 1.

¹⁸⁴ AGL, draft determination submission, p. 4.

¹⁸⁵ TasNetworks, draft determination submission, p. 3.

¹⁸⁶ ENA, draft determination submission, p. 1.

¹⁸⁷ CitiPower, Powercor, United Energy, draft determination submission, p. 2.

¹⁸⁸ Aurora Energy, draft determination submission, p. 2.

¹⁸⁹ Alinta Energy, draft determination submission, p. 3.

¹⁹⁰ Energy Queensland, draft determination submission, p. 7.

3. Provide for a length of soft start that balances the need for retailers to understand the magnitude of likely UFE payments with the costs of maintaining staff and teams until global settlements goes live
4. Minimise risk of the financial commencement of global settlements in the context of the commencement of five minute settlement.

The Commission considers that all of these priorities can be achieved through the following implementation schedule.

Table 7.2: Global settlement implementation timeframe

ITEM	DATE	EXPLANATION
Final determination and rule published	6 December 2018	
AEMO finalise procedure changes	1 December 2019	<ul style="list-style-type: none"> Aligned with 5 minute settlement changes to minimise costs.
Soft start begins	1 July 2021	<ul style="list-style-type: none"> Provides industry with 19 months from the time of AEMO finalising procedure and guideline changes to provide necessary data for commencement of soft start. Aligned with commencement of five minute settlement to align data provision.
Global settlements commences	6 February 2022	<ul style="list-style-type: none"> Provides for a (approximately) 7 month soft start, which will allow retailers to see the charges they are likely to face under global settlements and for corrective actions to be taken by AEMO and market participants to rectify errors. The 7 month soft start also minimises costs of having resources allocated to assist with implementation of the required changes. Reduces implementation risks by splitting the commencement date of global settlement with 5 minute settlement.

More detail on the Commission's consideration of the three focus areas of submissions is set out in section 7.6.1-7.6.3 below. The Commission's implementation schedule for the introduction of an AEMO UFE reporting framework is also set out below in section 7.6.4.

7.6.1

Information Exchange Committee requirements

The draft rule introduced requirements that the IEC release its recommended changes to B2B procedures by 1 July 2019, six months before AEMO released its broader updated

procedures. This requirement was introduced to mirror the requirements in five minute settlement.

As noted in section 7.5 above some retailers suggested that the IEC recommendations be made either in parallel or after the AEMO procedures are released. As the IEC is a statutory body comprised of representatives of AEMO and market participants, they would be best placed to identify what, if any, changes need to be made, and when to implement them. Therefore, the Commission is of the opinion that there should not be any requirement for the IEC to make recommendations in the rules, rather the IEC will update their procedures in a way that minimises implementation costs for its members.

7.6.2

Soft start for global settlements

In submissions some stakeholders, while recognising its value, suggested different lengths for the soft start for global settlements. AEMO and some DNSPs suggested the soft start should be reduced to six months, whilst some retailers suggested the soft start be from one to two years. In assessing the length of the soft start, the Commission has considered two competing factors, namely:

- the shorter the soft start, the shorter the time implementation project teams would need to be engaged, and the lower the implementation costs
- the longer the soft start, the more time is allowed for retailers to factor UFE into their operational and pricing decisions, and the more time for any system/IT issues associated with five minute settlement to be resolved before global settlement is implemented.

The Commission considers a soft start of around six months is the best option. This provides long enough for rectification of errors and transparency of likely UFE payments while keeping costs for participants associated with maintaining IT testing and project implementation teams within acceptable levels.

The draft rule also required DNSPs allocate connection points to a TNI and submit estimates of non-market unmetered load to AEMO three months prior to the soft start commencing. As the final rule does not require UFE to be calculated at the TNI level, this requirement is no longer required. Further, discussions with AEMO suggested data on non-market unmetered loads may not be required prior to the soft start commencing. If some non-market unmetered data is required, it could be requested through AEMO's procedures. In light of this, the Commission no longer require DNSPs to provide this data prior to the commencement of the soft start.

7.6.3

Commencement date for global settlement

Submissions to the draft determination shared a range of views on when the commencement date for global settlement should be. While most submissions recognised the benefits of aligning commencement with five minute settlement, there was variation in opinions on when the actual start date for global settlements should be. Submissions suggested three broad commencement dates:

1. some tier 1 retailers and TasNetworks supported the commencement date in the draft rule of 1 July 2021
2. AEMO and some DNSPs suggested the commencement date be moved to early 2022
3. Alinta and Energy Queensland suggested the commencement be either 1 July 2022 or 1 July 2023.

The Commission prefers the implementation process suggested by AEMO. Namely, global settlement soft start begins on 1 July 2021 and global settlement fully commences in early 2022. This option de-risks the system change by separating it from the five minute settlement implementation date whilst maintaining the benefits of having an aligned start between five minute and the soft start of global settlements.

Unlike five minute settlements, the commencement of global settlements does not need to be aligned with a financial year, as the change does not have financial products which need to be aligned with its commencement. Furthermore, this commencement date provides enough time for tier 2 retailers to adjust their pricing strategies to account for their UFE information available under the soft start.¹⁹¹

To avoid any disruptions and minimise costs for the implementation team working during the public holidays of Christmas, new year and Australia day, the Commission have decided to make the commencement date the first settlement cycle of February. As each settlement period begins on Sunday and ends on Saturday, the first new cycle of February is 6 February 2022.

7.6.4

UFE reporting requirements

As discussed in section 3.5 for the final determination, the Commission has introduced a reporting obligation on AEMO to report on UFE levels, possible sources and potential ways to reduce UFE. The Commission considers that this report on UFE levels should commence as soon as possible after information under global settlements is available. The final rule therefore requires AEMO to provide the first report on UFE by 1 March 2022. This will allow AEMO two months to analyse data from the first six months of the soft start of global settlements and report in this information. The final rule then requires AEMO to report on UFE levels at least annually.

The transitional provisions exempt AEMO from needing to comply with the guideline when producing the first report. This will allow AEMO the time to observe UFE levels during the soft start before being required to determine its long term reporting strategy through the guideline. It will also allow AEMO to incorporate learnings from its first report into the guideline. The timeframes for the UFE reporting requirements in the final rule are illustrated in Table 7.3.

¹⁹¹ It will also allow retailers in Victoria time to be able to incorporate several months of UFE data before they submit their pricing changes in accordance with gazetting requirements.

Table 7.3: UFE reporting requirements

ITEM	DATE
Soft start commences	1 July 2021
First UFE report due	1 March 2022
UFE reporting guidelines completed	1 December 2022
Second UFE report due	1 March 2023

7.7

Summary of implementation schedule

Table 7.4 below provides a summary of the complete implementation schedule under the final rule. It also compares the requirements to those in the draft determination.

Table 7.4: Global settlements implementation changes from draft and final rule

ACTION	DRAFT DETERMINATION	FINAL DETERMINATION
IEC finalise recommendations	1 July 2019	No date specified
AEMO finalise amendments to procedures	1 December 2019	1 December 2019
DNSPs to assign connection points to a TNI and estimate volumes of non-market unmetered loads	1 March 2020	Not required
AEMO publish UFE data	1 July 2020	1 July 2021
Global settlement begins	1 July 2021	6 February 2022
AEMO publish first UFE report	Not required	1 March 2022
AEMO finalise UFE reporting guideline	Not required	1 December 2022
AEMO publish second UFE report	Not required	1 March 2023

8 ABBREVIATIONS

AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
AEST	Australian Eastern Standard Time
COAG	Council of Australian Governments
Commission	See AEMC
DLF	Distribution Loss Factor
DNSP	Distribution Network Service Provider
FRMP	Financially Responsible Market Participant
IEA	International Energy Agency
IT	Information Technology
LNSP	Local Network Service Provider
MCE	Ministerial Council on Energy
MDFF	Meter Data File Format
MDM	Meter Data Management
MDP	Metering Data Provider
MLF	Marginal Loss Factor
MSATS	Market Settlement and Transfer Solution
NATA	National Association of Testing Authorities
NEL	National Electricity Law
NEM	National Electricity Market
NEO	National Electricity Objective
NER	National Electricity Rules
NMI	National Metering Identifier
NSLP	Net System Load Profile
ROLR	Retailer of Last Resort
SCADA	Supervisory Control and Data Acquisition
TNI	Transmission Node Identifier
TNSP	Transmission Network Service Provider
UFE	Unaccounted For Energy
VTN	Virtual Transmission Node

A SUMMARY OF OTHER ISSUES RAISED IN SUBMISSIONS

This appendix sets out the issues raised in the first and second round of consultation on this rule change request and the AEMC's response to each issue. If an issue raised in a submission has been discussed in the main body of this document, it has not been included in these tables. Table A.1 summarises issues raised in submissions to the consultation paper, while Table A.2 summarises issues raised in submissions to the draft determination.

Table A.1: Summary of other issues raised in consultation paper submissions

STAKEHOLDER	ISSUE	AEMC RESPONSE
AEMO, p. 2.	The effect of increasing penetration of distributed resources on loss calculations requires further consideration in the broader and ongoing review of distributed resources. This issue needs to be considered beyond the global settlements proposal.	While this issue may require further consideration, it is not directly related to the Global settlements rule change request, and is out of scope for this rule change.
AGL Energy, p. 4.	Unregistered generation such as rooftop solar needs to be metered appropriately to ensure the accurate accounting of supply and UFE.	The Commission recognises the importance of unregistered generation being properly accounted for. There are currently incentives in place for unregistered generators to be metered appropriately, such as receiving feed-in tariffs. Any further obligation on metering would be outside the scope of this rule change.
Ausgrid, p.6.	With increasing penetration of advanced metering, it is worth considering whether samples of smart meter data could be used by AEMO for the NSLP calculation.	Any changes to the methodology to develop the NSLP would fall outside the scope of this rule change request.
EnergyAustralia, p. 3.	A retailer of last resort (ROLR) event requires historical consumption data for automatically transferred customers. Often, the ROLR and the local retailer are the same retailer so when a ROLR event occurs, the retailer has access to historical consumption data. If ROLRs no	The Commission notes that the majority of the ROLR provisions are established in the National Energy Retail Law (NERL). The rule change request was made under the NEL and the Commission

STAKEHOLDER	ISSUE	AEMC RESPONSE
	longer receive this data in advance of an event, there could be financial contagion if ROLRs are unable to appropriately hedge their financial risk, as well as delays in setting up customers on appropriate contracts. This is currently an issue in cases where the designated ROLR differs from the local retailer, but would become a broader issue under this proposed change. A possible solution is to ensure that historical meter data is provided by AEMO within 24 hours of a ROLR event occurring, with an indication from AEMO regarding the aggregate size of the load being transferred to be provided within 12 hours.	does not consider it is necessary or consequential to also make a rule under the National Energy Retail Rules amending the ROLR provisions. Under s 144 of the NERL, AEMO is responsible for making the ROLR Procedures. These Procedures are part of the MSATS Procedures. The NEM ROLR Processes in MSTAS Procedures would seem to be the appropriate place to put in a time limit for the transfer of historical metering data.
Energy Consumers Australia, p. 2	The current arrangement and global settlement proposal fail to incentivise management of the level of technical losses. It suggested that an alternative approach involving a Distribution System Operator could address this issue, hence it may be premature to move to global settlement now.	The matter of incentives to minimise distribution network technical losses was not identified in AEMO's rule change request. Therefore, measures to reduce technical losses are outside of the scope of this process. Rather, the Commission's draft rule improves incentives for technical losses to be accurately reflected via DLFs, and for UFE to be more accurately allocated to market customers in order to improve incentives to reduce UFE. The Commission considers that implementing global settlement does not preclude the establishment of a Distribution System Operator arrangement at a later time.
Energy Queensland, p.1.	We do not support providing individual metering data at a NMI level for types 5-7 metering installations to the MDFF NEM 12 and NEM 13 formats used in settlement. In the event that the rule change is successful, we would support continuation of the existing settlement	The file format that AEMO will require to implement global settlement will be decided upon in its reassessment of its procedures as a result of the rule if made.

STAKEHOLDER	ISSUE	AEMC RESPONSE
	process where data is aggregated to the TNI level.	
ERM Power, p. 5.	AEMO has a revision policy whereby a percentage threshold exists for a special revision (5%). This will be less likely to be triggered under a global settlements approach. However, the rule should be changed to allow for a request of special revision if any individual retailer's acquisition would be impacted by greater than 5%.	This is an issue for AEMO to consider in its reassessment of its procedures as a result of the rule if made.
Flow Power, p. 1.	The ratio of independent retailers to local retailers varies between regions and states. If the global settlement rule is adopted, it will result in customers paying a different rate per unit of consumption from one region to another – even from the same power source.	<p>The Commission's draft rule specifies that UFE will be allocated based on a market customer's 'accounted-for' energy at the local area level. Hence, the UFE allocated to independent retailers is unrelated to the market share of the local retailer.</p> <p>To the extent that this causes difference from one region to another, this would be due to the UFE being more accurately allocated, which is likely to increase the cost-reflectivity of prices. The Commission considers this to be a benefit of the change as it will result in an increase in allocative efficiency.</p>
Origin Energy pp. 1-2.	Data errors contribute to UFE, and resolving these errors has been problematic. Origin suggests that incentives (and/or a specific requirement) is added to the Rules for DNSPs to maintain the integrity of the data they hold, and expeditiously address any data errors - including those identified by retailers. This will ultimately lead to lower amounts of UFE, and thus see UFE costs reduced across all retailers. For example, Origin has observed some TNIs with far more	The draft rule provides for AEMO to undertake reviews where UFE exceeds a defined threshold within a TNI. This will provide a process to resolve data errors such as those noted by Origin Energy.

STAKEHOLDER	ISSUE	AEMC RESPONSE
	UFE than can be explained by factors such as theft, and conversely found some TNIs where UFE was negative compared to published loss factors. We hypothesised that these anomalies were likely NMI-to-TNI allocation errors in the standing data maintained by the DNSPs.	
PLUS ES, pp. 4-5.	PLUS ES would need to understand the intention of services AEMO would support with 100 per cent data being provided to determine what savings there may be to gain as an MDP. PLUS ES has a large Valued Added Services market it services. With AEMO holding a Central Repository of all data, what provisions will be in place around VAS services directly from AEMO which will impact the PLUS ES business.	The provision of competitive metering services is not one of AEMO's statutory functions under the NEL. Further, metering service providers need to be accredited and registered with AEMO, and AEMO is not able to accredit and register itself.
Red Energy and Lumo Energy p. 2.	AEMO also settles many gas markets by difference; however this rule change only focuses on AEMO wanting to rectify anomalies in electricity settlements.	The rule change request received by AEMO sought amendments to the National Electricity Rules. It is out of scope of this rule change to consider changes to the National Gas Rules.
South Australian Government, p. 2.	The Division notes that AEMO's rule change request proposes deletion of certain references to 'local retailers' in the National Electricity Rules. In making these changes it will be important that no unintended consequences flow for the customer protections under the National Energy Customer Framework, and in particular the obligations of local area retailers under the National Energy Retail Law (South Australia) Act 2011 to provide connections to customers where there is no existing connection.	In its more preferable draft rule, the Commission has not removed reference to the local retailer in the National Electricity Rules.

Table A.2: Summary of other issues raised in draft determination submissions

STAKEHOLDER	ISSUE	AEMC RESPONSE
AEMO, p. 5.	It is not clear that the proposed drafting of clause 2.2.5 (and the corresponding amendment to clause 2.2.4) will have the effect of removing the ability for a generating unit to be classified as non-market if any of its generation could be exported beyond its connection point. Any financially responsible market participant who agrees to buy the output of generation co-located with a load is potentially a 'Customer located at the same connection point' who is purchasing the sent out generation in its entirety. AEMO considers that more fundamental drafting changes may be necessary.	The final rule has been amended to clarify that going forward and unless exempt from registration, a generating unit can no longer be classified as non-market if any of its generation will be exported beyond its connection point to the market.
ENA, p. 2.	<p>Energy Networks Australia notes that the Draft Determination suggests that there is a concept of embedded networks at the transmissions level;</p> <p>"Embedded networks are private electricity networks which serve multiple customers and are connected to another distribution or transmission system through a parent connection point. A party other than the registered LNSP owns and operates the private electricity network that customers connect to."(p.54)</p> <p>Whilst not directly relevant to the scope of this rule change, the National Electricity Rules (NER) definition of embedded networks only refers to distribution networks;</p> <p>"embedded network - A distribution system, connected at a parent connection point to either a distribution system or transmission system that forms part of the national grid, and which is owned, controlled or operated by a person who is not a Network Service</p>	This issue is out of scope of the Global settlements rule change.

STAKEHOLDER	ISSUE	AEMC RESPONSE
	<p>Provider.” (NER., s10)</p> <p>Energy Networks Australia considers the AEMC statement is confusing in relation to the rules definition of embedded networks, and in relation to connections from primary or other transmission network service providers (TNSP) to a Dedicated Connection Asset Service Provider, and multiple connections to Large Dedicated Connection Assets (LDCA). In the event multiple TNSPs are involved in the connection the metering rules in 7.6.2 and 7.6.3 are not clear on which TNSP is responsible for metering the connection points. It would be useful if the AEMC could clarify this point in its Final Determination, even if the clarification makes it clear that either the TNSP on the primary side of the connection point or the TNSP on the secondary side of the connection costs must be appointed as MC.</p>	
Plus ES, p. 2.	<p>PLUS ES recommends that the provision of metering data to MSATS for both non-market unmetered loads and non-controlled load accumulation meters is necessary to support the transition to global settlements and could be delivered within the existing metering data file formats (MDFF to market participants and MDM to MSATS).</p>	<p>This is an issue for AEMO to consider in its reassessment of its procedures as a result of the global settlements and five minute settlement rules.</p>
TasNetworks p. 2.	<p>Given anomalies in UFE calculations may not be material for every jurisdiction or Transmission Node Identifier (TNI), TasNetworks considers that extending the existing type 7 classification to accommodate non-contestable, unmetered boundary cases would seem preferable to implementing an entirely new metering class to facilitate this. Regarding National Meter Identifier (NMI) allocations for non-contestable unmetered loads, TasNetworks notes that current NMI Procedure calls for unmetered connection points to be</p>	<p>This is an issue for AEMO to consider in its reassessment of its procedures as a result of the global settlements and five minute settlement rules.</p>

STAKEHOLDER	ISSUE	AEMC RESPONSE
	aggregated to one NMI. This makes perfect sense for streetlights which account for the majority of contestable unmetered points in MSATS today. However, when bringing the remaining non-contestable points into the system, TasNetworks suggests that allowing individual NMIs for each connection point to be retained in the final rule. For reference, TasNetworks has already allocated and registered individual NMIs in MSATS for each set of traffic lights, railway crossings, private/watchman lights etc. in Tasmania. Any change requiring aggregation of these unmetered connection points to one NMI would jeopardise the value from the previous completed work and would also be likely to impose additional administrative costs which would not be in keeping with customers best interests.	
ENA, p. 2	We also consider that the new term 'non-market unmetered load' is confusing because it becomes contradictory under the proposed global settlements arrangement. These types of loads are currently called non-market unmetered loads because the customer for these connections does not have a choice of retailer. However, under the proposed global settlements arrangement we expect that these type of loads will have retailer choice. We suggest a different term be used, such as 'type 7A'. It should be noted, that currently most DNSPs manage existing non-market unmetered loads by assigning a pseudo-NMI to each connection point for these type of loads. Therefore, to minimise changes to systems and cost it would be preferred if the final rule allows for this method continue.	These loads will continue to be non-contestable. In addition the final rule is not creating a new category of meter type for these loads. Therefore the Commission considers that this term is appropriate.
ENA, p. 2.	We are also concerned that the definition of 'non-market unmetered load' suggests that these types of loads will not be classified as a type 7 metering installation. This would lead to the unintended	The Commission note this suggestion, and has amended the final rule to ensure DNSPs are the metering coordinator for non-market unmetered

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	consequence of clause 7.6.4 not being applicable, therefore the DNSP cannot be the MC for these types of loads.	loads.
Energy Queensland, p. 5.	Energy Queensland is also unclear how the settlement of revisions following the cut-over to global settlements will be managed, beyond those triggered by UFE investigations. For example if Week One Preliminary is issued using the differencing method, but one week later global settlements commences, how will AEMO issue, and participants reconcile subsequent statements (R1, R2 and Final) issued post the cut-over date? In facilitating the implementation, Energy Queensland queries the ability to run parallel systems and processes for a period of time to manage the above scenario.	This is an issue for AEMO to consider in its reassessment of its procedures as a result of the global settlements.
Sumo Power, p. 2.	It is still relevant to note that local retailers continue to derive significant benefit from having acquired the local customer base: the number of customers remaining on standing offers may be declining, but many of those sticky customers have merely transitioned to market contracts with those same retailers. Rather, Sumo considers that the commission should support measures that encourage a competitive market by reducing barriers to entry and expansion in the market...although a local retailer currently bears the risk of UFE within its area, it is not clear whether this risk derives a benefit or a cost to the local retailers.	The Commission note that the decision to move to global settlements was done in accordance with the NEO. If stakeholders have other specific changes the rules they wish the Commission to assess, they should submit a rule change request.
AEMO, p. 4.	The definition of Local Retailer should be simplified to "responsible under the laws of the relevant participating jurisdiction for the supply of electricity to franchise customers in that local area".	The definition of Local retailer has been amended.
AEMO, p. 5.	Amending the definition of first-tier load to align with amended definition of local retailer.	This definition has been amended.

B LEGAL REQUIREMENTS UNDER THE NEL

This appendix sets out the relevant legal requirements under the NEL for the AEMC to make this final rule determination.

B.1 Final rule determination

In accordance with s. 102 of the NEL the Commission has made this final rule determination in relation to the rule proposed by AEMO.

The Commission's reasons for making this final rule determination are set out in sections 2.3 to 2.4 of this final rule determination, and in more detail in Chapters 3 to 7.

A copy of the more preferable final rule is attached to and published with this final rule determination. Its key features are described in section 2.3.

B.2 Power to make the rule

The Commission is satisfied that the more preferable final rule falls within the subject matter about which the Commission may make rules. The more preferable final rule falls within s. 34 of the NEL as it relates to:

- the operation of the NEM
- the activities of persons (including Registered Participants) participating in the NEM or involved in the operation of the national electricity system.

Further, the more preferable final rule falls within the matters set out in Schedule 1 to the NEL as it relates to:

- the payment of money for settlement of transactions or electricity purchased or supplied through the wholesale exchange operated and administered by AEMO
- the regulation of persons providing metering services relating to the metering of electricity.

B.3 Commission's considerations

In assessing the rule change request the Commission considered:

- its powers under the NEL to make the rule
- the rule change request
- submissions received during first and second round consultation
- the Commission's analysis as to the ways in which the proposed rule will or is likely to, contribute to the NEO.

There is no relevant Ministerial Council on Energy (MCE) statement of policy principles for this rule change request.¹⁹²

The Commission may only make a rule that has effect with respect to an adoptive jurisdiction if satisfied that the proposed rule is compatible with the proper performance of AEMO's declared system functions.¹⁹³ The more preferable final rule is compatible with AEMO's declared network functions because it leaves those functions unchanged.

B.4 Civil penalties

The Commission cannot create new civil penalty provisions. However, it may recommend to the COAG Energy Council that new or existing provisions of the NEL be classified as civil penalty provisions.

The final rule does not amend any clauses that are currently classified as civil penalty provisions under the NEL or National Electricity (South Australia) Regulations. The Commission does not propose to recommend to the COAG Energy Council that any of the proposed amendments made by the final rule be classified as civil penalty provisions.

B.5 Conduct provisions

The Commission cannot create new conduct provisions. However, it may recommend to the COAG Energy Council that new or existing provisions of the NEL be classified as conduct provisions.

The final rule does not amend any rules that are currently classified as conduct provisions under the NEL or National Electricity (South Australia) Regulations. The Commission does not propose to recommend to the COAG Energy Council that any of the proposed amendments made by the final rule be classified as conduct provisions.

B.6 Northern Territory consideration

From 1 July 2016, the NEL, as amended from time to time, apply in the Northern Territory, subject to derogations set out in Regulations made under Northern Territory legislation adopting the NEL. Under those Regulations, only certain parts of the NEL have been adopted in the Northern Territory.

The final rule amends clause 6.20.1 of Part J of Chapter 6 of the NEL. Part J of Chapter 6 will apply in the Northern Territory from 1 July 2019 unless the Northern Territory modifies the application of that clause in the Northern Territory before that date.

The final rule amends provisions in Chapter 7 of the NEL. From 1 July 2019 the Northern Territory's Chapter 7A will apply in substitution for Chapter 7. The Commission has therefore considered the reference to the national electricity system in the NEO to be a reference to

¹⁹² Under section 225 of the NEL the AEMC must have regard to any relevant MCE statement of policy principles in making a rule. The MCE is referenced in the AEMC's governing legislation and is a legally enduring body comprising the Federal, State and Territory Ministers responsible for energy. On 1 July 2011, the MCE was amalgamated with the Ministerial Council on Mineral and Petroleum Resources. The amalgamated council is now called the COAG Energy Council.

¹⁹³ Section [91(8) of the NEL/ 295(4) of the NGL].

the interconnected national electricity system and not the local distribution systems in the Northern Territory.

As the more preferable final rule either does not currently apply in the Northern Territory or, for the new Chapter 10 definitions, applies to parts of the NER that have not yet been adopted in the Northern Territory, the Commission has not assessed the proposed rule against additional elements required by Northern Territory legislation.