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By online submission

Dear Mr Pierce

Rule Change Request – Embedded Networks

The Australian Energy Market Operator (AEMO) requests the Australian Energy Market Commission (AEMC) consider making a rule change under section 91 of the National Electricity Law.

As requested by the Council of Australian Governments' (COAG) Energy Council, the proposed rule will clarify the metering and other arrangements for consumers in embedded networks, reduce the barriers to consumer access to competitive offers from market participants and support competition in the provision of electricity and demand side services.

AEMO would appreciate the AEMC considering the attached rule change request. For further details, please do not hesitate to contact AEMO's Acting Group Manager – Retail Markets and Metering, Fiona Savage on (03) 9609 8684.

Yours sincerely



Mike Cleary
Chief Operating Operator

Attachments: Embedded Networks Rule Change
Appendix A – Embedded Network Manager Rule Change Drafting
Appendix B - Embedded Networks – Detailed Market Design
Appendix C – Table of Issues Raised by Participants
Appendix D – Jacobs SKM Cost Benefit Report

NATIONAL ELECTRICITY RULE CHANGE REQUEST – EMBEDDED NETWORKS

DATE: September 2014

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1 Summary

The Australian Energy Market Commission's (AEMC) final advice on Energy Market Arrangements for Electric and Natural Gas Vehicles and Power of Choice review recommended arrangements for metering within an embedded network be included in the National Electricity Rules (NER).

In response, the Standing Council on Energy and Resources (SCER) (now called the Council of Australian Governments (COAG) Energy Council) directed AEMO to develop and submit rule changes to recognise embedded network arrangements within the national regime. In accordance with the COAG Energy Council request, this rule change proposal is being lodged for the AEMC's consideration.

Embedded networks are private networks which are connected to a distribution system in the National Electricity Market (NEM) that have been exempted by the Australian Energy Regulator (AER) from the requirement to be registered with AEMO as a network service provider.

Currently there is no specific reference in the NER to embedded networks, and no consistent national regime around the management of embedded networks and access to retail competition by customers within embedded networks. The lack of clarity in these arrangements poses a barrier to embedded network customers' ability to contract with a retailer of their choice.

The proposed rule change would create a new category of service provider termed the embedded network manager (ENM) in the NER, to manage embedded network customers in the NEM.

The AER would only be permitted to grant an exemption from the requirement to be registered as a registered network service provider if the owner, operator or controller of the embedded network has appointed an ENM. (This requirement is waived for smaller networks where deemed AER exemptions currently apply.)

The ENM would be responsible for the functions required to facilitate the transfer of customers between the owner, operator or controller of an embedded network (ENO) and NEM retailers (such as Market Settlement and Transfer Solutions (MSATS) and Business to Business (B2B) transactions).

Consequential change will be required to the AER's network service provider exemption guideline to fully implement the proposed rule changes. In particular the application of the proposed rules to existing embedded networks will be the addressed in amendments to the network exemption conditions. AEMO recommends that the guideline allows existing embedded networks a period of up to two years to appoint an ENM.

A cost benefit analysis of the high level market design of the solution indicated that there are long term benefits to consumers from reducing the barriers to competition within embedded networks. The assumptions within that cost benefit analysis were conservative and so the net benefits may be understated. In developing the more detailed design and the proposed rule changes AEMO has looked to minimise the costs of the work while maintaining the integrity of the processes involved.

Currently a number of jurisdictions do not permit customers within embedded networks to seek competitive offers from NEM retailers. The proposed rule change should provide clarity of the roles that will allow the relaxation of these conditions and increase the competition benefits of the proposed rule change.

2 Background

2.1 Origin of the rule change proposal

The AEMC's final advice on Energy Market Arrangements for Electric and Natural Gas Vehicles¹ made a number of recommendations relating to arrangements that would support multiple trading relationships at a single site, and arrangements for embedded networks in the NER. These were further noted in the AEMC's Power of Choice final report² which set out a substantial reform package for the NEM. The package is intended to provide households, businesses and industry with more opportunities to make informed choices about the way they use electricity and manage their expenditure on electricity.

In this rule change proposal we refer to the AEMC's final advice on Energy Market Arrangements for Electric and Natural Gas Vehicles and Power of Choice final report collectively as the 'AEMC reports'.

Among other things, the AEMC reports foreshadowed changes to the NEM that would enable:

- Multiple trading relationships – allowing multiple commercial relationships at a single connection point, including more than one financially responsible Market Participant (FRMP), Responsible Person (RP), Metering Provider (MP), Metering Data Provider (MDP), or Small Generator Aggregator (SGA). This is intended to ensure that competition for provision of retail services (for buying and selling energy at their site) is offered to and available to customers; and
- Embedded networks – clarification of metering and other arrangements applicable to embedded networks, to minimise the risk that these arrangements pose a barrier to customers' ability to access offers from competing Market Participants.

On 31 July 2013, the SCER (now known as the COAG Energy Council) requested AEMO to lead the implementation of policy initiatives facilitating multiple trading relationships at a single site, and for metering arrangements in embedded networks.

AEMO, with the support of a stakeholder reference group, has developed a high level market design and detailed market design for the implementation of these initiatives. During the design development process, AEMO split the initiatives into two parts and is progressing the multiple trading relationships and embedded network components separately.

This rule change proposal relates to only the embedded networks component of the original request.

2.2 Current regulatory arrangements

2.2.1 Context

Currently, embedded network arrangements exist and operate across all jurisdictions in the NEM. The Jacobs SKM cost benefit analysis undertaken as part of this project considered approximately 500 major embedded networks, but there are many thousands of smaller embedded networks across the NEM. Anecdotal evidence is that there has been unprecedented growth in the embedded network sector in the past few years. A number of specialist ENOs now exist to assist the network operators manage their obligations within embedded networks.

¹ AEMC 2012. *Energy Market Arrangements for Electric and Natural Gas Vehicles, Final report*. Available: <http://www.aemc.gov.au/Markets-Reviews-Advice/Energy-Market-Arrangements-for-Electric-and-Natural-Gas-Vehicles-Final-Report>. Viewed 14 July 2014

² AEMC 2012. *Power of Choice Review – Giving Consumers Options in the way they use Electricity, Final Report*. Available: <http://www.aemc.gov.au/Markets-Reviews-Advice/Power-of-Choice-Stage-3-DSP-Review>. Viewed 14 July 2014

2.2.2 Current rules

Under the National Electricity Law (NEL) anyone who engages in an electricity distribution activity must either be:

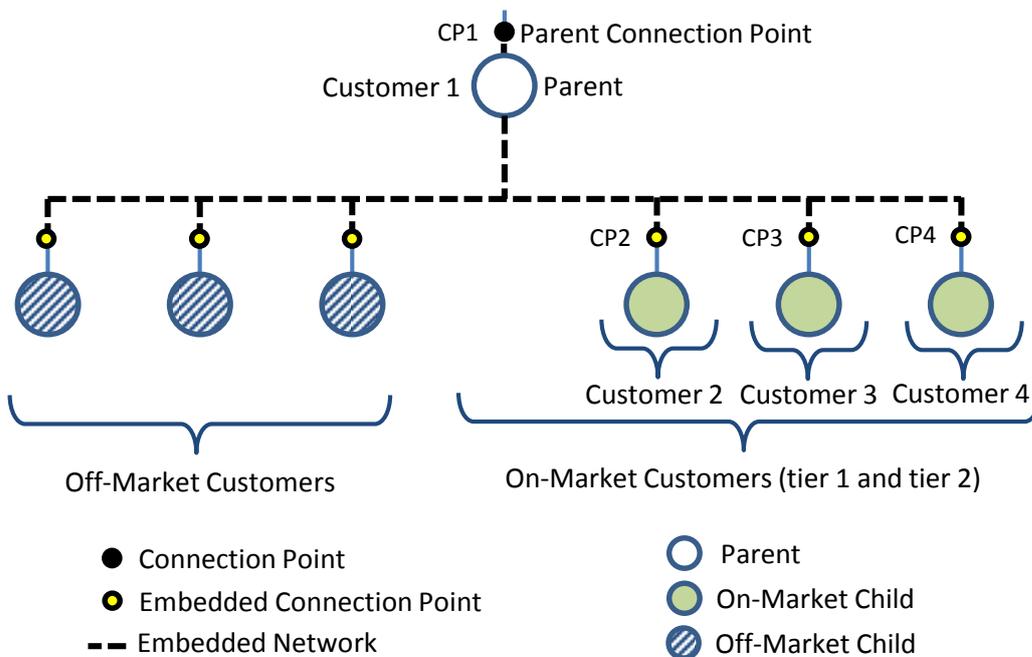
- Registered with AEMO as an electricity network service provider³; or
- Exempt from the requirement to register as a network service provider in accordance with AER guidelines⁴.

Embedded networks are private networks which serve multiple premises. The ENO will usually obtain an exemption from the AER in respect of the requirement to be registered as a network service provider.

Currently there is no specific reference in the NER to the management of embedded networks and the customers connected to those networks. Embedded network arrangements exist across all NEM jurisdictions, however, there is no consistent national framework regulating the access to retail competition for embedded network customers. The detailed roles and responsibilities with respect to those customers differ across jurisdictions.

The AER’s Electricity Network Service Provider Registration Exemption Guideline⁵ (the network guideline) details the exemption conditions. The network guideline defines three classes of embedded networks: deemed, registrable and individual. Many small embedded networks are eligible for deemed exemptions and are therefore not required to apply to the AER for an exemption. Deemed exempt networks must still meet the criteria and conditions applicable for the size and complexity of the embedded network.

Figure 1 shows a typical arrangement of an embedded network. The embedded network customers (or ‘children’) who are ‘off-market’ purchase their electricity from the ‘parent’ (usually the ENO or its agent), who must gain an exemption from the requirement to have a retail authorisation from the AER. The off market child connection points are not recognised in the NEM systems. The AER (Retail) Exempt Selling Guideline⁶ details the conditions applicable to the exempt seller. The ‘on-market’ children purchase their electricity from a NEM retailer and are visible within the NEM systems.



³ NEL section 11(2)(a) and NER, clause 2.5.1(a)

⁴ NEL section 11(2)(b) and NER, clause 2.5.1(d)

⁵ AER. 2013. *Electricity Network Service Provider Registration Exemption Guideline*. Available: <http://www.aer.gov.au/node/19196>. Viewed: 14 July 2014.

⁶ AER. 2013. *AER (Retail) Exempt Selling Guideline*. Available: <http://www.aer.gov.au/node/19196>. Viewed: 18 September 2014.

Figure 1 – Structure of an embedded network

In the majority of cases, all connection points within the embedded network are off-market and the customer purchases their electricity from the parent ENO or its agent. The AEMC's proposed Power of Choice reforms seek to reduce the barriers to contestability to the connection points within the network and encourage off-market customers to seek competitive prices from both NEM retailers and their parent exempt seller.

2.2.3 Jurisdictional arrangements

Currently, embedded network arrangements are regulated by the AER, and ENO's are required to gain exemptions from registering with AEMO as a network service provider and as a retailer from the AER. The ability for embedded network customers to seek competitive prices from retailers other than the exempt embedded network seller varies across the jurisdictions. While Victoria New South Wales and South Australia have regulatory frameworks that support this, other jurisdictions, such as Queensland, ACT and Tasmania do not permit embedded network customers to seek competitive prices.

In those jurisdictions where customers within embedded networks are permitted to seek competitive electricity supply contracts, the provisions of the NER and Retail Market Procedures come into effect through regulations imposed by the jurisdiction, and there is little consistency between the jurisdictional frameworks.

3 Consultation process

The SCER terms of reference recommended that AEMO consult with key stakeholders to develop the embedded network rule changes. AEMO engaged with industry and consumer representative groups and established the Multiple Trading Relationship and Embedded Networks Reference Group (the reference group) to provide input to AEMO on the development of the multiple trading relationship and embedded networks arrangements. This reference group included representatives of parties likely to be impacted by the rule change request, including:

- Small end-users;
- Embedded network owners;
- Embedded network operators;
- Third party service providers;
- Retailers;
- Distribution network service providers;
- Transmission network service providers; and
- The AER.

The reference group assisted AEMO in the development of a high level market design. To provide more details around the design AEMO produced a series of detailed design documents covering each of the key issues identified in the development of a high level market design. These were presented to the reference group and amended where necessary to address issues raised by stakeholders.

The detailed design documents were combined into a single detailed market design document which is set out in Appendix B. The reference group was not asked to endorse the rule change request or detailed market design, rather its feedback informed AEMO's proposed design.

AEMO also undertook one-on-one discussions with a number of key stakeholders including ENOs, jurisdictional representatives, retailers and distribution network service providers to seek specific

feedback on the proposed approach. These were considered and reflected in the detailed market design as appropriate.

Details of the major issues raised during the consultation process can be found in Section 6.10 and Appendix C.

The detailed market design was used as the basis of the proposed rule change.

4 Statement of issue

The AEMC reports outlined a number of issues with the existing embedded network arrangements.

The AEMC reports identified that there is little clarity to the roles and obligations of the various parties with an interest in the embedded networks and their embedded customers. While the local network service provider (LNSP) is responsible for electricity supply to the parent connection point (as it is attached to the LNSP's distribution network), it is generally not responsible for supply to on-market customers and off-market customers within the network. The LNSP has no other operational responsibility within an embedded network.

The NER does not make it clear who has the obligation to support NEM activities related to customers within embedded networks. In particular there is a lack of clarity over the following:

1. Who has the obligation to set up and maintain the MSATS standing data for an embedded network?
2. Who is responsible for ensuring that data on life support customers is maintained?
3. Who performs the NEM processes for the transfer of customers between retailers, in particular between the ENO and a registered retailer?
4. How are distribution loss factors (DLFs) set for customers within an embedded network?
5. Who has access to customer metering data?
6. Who is responsible for metering for customers who have chosen their own retailer?

This lack of clarity leads to a lack of uniformity even within those jurisdictions that allow embedded network customers to seek competitive offers. This in turn requires retailers to understand and manage many different arrangements, which increases the costs and time required to identify, transfer, bill and maintain embedded network customers. These transaction costs and information barriers are potentially reducing the number of offers made to embedded network customers.

Clarifying and codifying the rules and procedures around embedded networks should make it easier, quicker and cheaper for retailers to make offers to embedded network customers.

It should also provide a basis for the remaining NEM jurisdictions to permit embedded network customers to seek competitive offers. This would increase competition and improve regulatory certainty between jurisdictions.

5 Proposed solution

AEMO has prepared a detailed market design document based on the high level market design developed in response to the COAG Energy Council terms of reference. In preparing this design, AEMO considered alternative design options raised during the process. These are summarised together with AEMO's considerations in Appendix C.

AEMO's proposed solution would address the issues discussed in Section 4 by clarifying the roles and responsibilities of the parties involved in embedded networks to efficiently support the ability of customers within those networks to seek competitive retail offers. The role of Embedded Network Manager (ENM) would be created under the NER as a service provider responsible for all obligations in relation to the management of on-market children supplied by the embedded

network. An accreditation process will ensure that ENMs have the required skills, experience and understanding of NEM systems to undertake the role.

The proposal clarifies that, while the LNSP is responsible for electricity supply to the parent connection point of the embedded network, it is not responsible for supply to on-market or off-market child connection points within the embedded network.

The certainty provided by this approach will lower the barriers for retail competition within embedded networks by addressing existing problems in the operational interfaces between embedded networks and the NEM. While there will be a cost to the ENO (or its agent) from the appointment of the ENM, there should be significant savings to the ENO and customers from:

- replacing the current ad hoc approach to embedded network connection points with a streamlined process within the standard NEM processes; and
- enabling embedded network customers to choose their retailer.

The following section provides an overview of the proposed design and how it addresses the issues identified.

5.1 Process to develop solution

In developing the proposed solution, AEMO, with the assistance of the reference group, sought to identify the functions that were required to facilitate the administration of the processes around the management of customers within embedded networks and their access to competitive electricity offers. These functions can be seen as comprising a new specific role of embedded network management. Many of the functions of this role involved an interaction with the AEMO retail market systems for MSATS and B2B processes.

The functions identified include:

- Allocating a code (which will be a unique name for the embedded network) to the parent National Metering Identifier (NMI) at the embedded network and maintaining that code in MSATS;
- Requesting AEMO to provide NMIs and allocating these NMIs to child metering installations in MSATS when the embedded network customer wishes to become an on-market child;
- Managing MSATS and B2B interfaces for the embedded network connection points;
- Maintaining all standing data required in connection with on-market embedded network child NMIs;
- Where electricity supply must be maintained for life support requirements, notifying the FRMP of the parent connection point of the requirement;
- Fulfilling the LNSP role within MSATS for the on-market embedded network child connection points;
- Maintaining information about the subtractive metering arrangements relating to the configuration of the metering installation and making that information available on request to any retailer to whom an embedded network customer is proposing to transfer or to that retailer's metering provider; and
- Communicating with local retailers, market customers and distribution network service providers in relation to all on-market and prospective on-market embedded network customers;

Having determined the functions, AEMO then considered the options for the appropriate person (or people) to undertake this role.

Options considered included:

- LNSP for the parent connection;

- Local retailer for the parent connection;
- A new classification of market participant;
- The ENO;
- A new classification of service provider; or
- Some other entity.

AEMO recognised the need to keep the additional costs of this role to a minimum while ensuring that the integrity of the customer transfer systems was maintained. The proposal is for the role to be contestable and adopt a service provider classification - based on the approach taken for metering providers and metering data providers - to be called the Embedded Network Manager (ENM). An ENM would be appointed for each embedded network to undertake the functions identified.

A service provider role is proposed rather than a participant classification, as the ENM is providing a service to others rather than trading in the market. The service:

1. Ensures that embedded network customers have the option to buy from retailers rather than buying from the ENO (or its agents); and
2. Relieves the ENO (or its agents) from having to acquire and develop the qualifications, skills and experience required to undertake those tasks.

Such an approach will allow ENOs to choose who performs this role. The proposed approach provides assurance (through an AEMO accreditation process) of capability to provide the service, without incurring the high costs of full NEM registration. The proposal requires AEMO to develop service level requirements for businesses that wish to undertake the ENM role.

Under this proposal the ENM would undertake all of the responsibilities identified in section 4 of this rule change proposal.

5.2 Who can be an ENM

As the ENM role has been defined around the range of functions required to be undertaken, the proposal does not restrict who can become accredited as an ENM. This will allow a wide range of potential ENMs, both existing participants and new entrant businesses. Under the proposed rules, ENMs will be accredited by AEMO. The NER will provide in detail for the qualifications, skills and experience ENMs require to be eligible for accreditation by AEMO. AEMO will produce and maintain service level procedures for this purpose.

It would be possible for ENOs to undertake these functions directly if they apply to AEMO to be accredited as an ENM, and can establish that they meet the requirements set out in the NER and the ENM service level procedures.

The proposal allows for those registered Market Customers and Network Service Providers who wish to offer this service to be deemed to be accredited as ENMs as part of their AEMO registration. These market participants are familiar with the AEMO systems and are already required to undertake a wide range of functions that would be required of an ENM. Deemed ENMs will be subject to the same review and compliance regime as other accredited ENMs.

The role of ENM is contestable. To ensure a level playing field, any ENM activities undertaken by a registered Network Service Provider should be ring fenced from its regulated business activities. This may require the AER to develop ring fencing guidelines as contemplated under clause 6.17 of the NER.

Should an ENM breach of the provisions of the NER or of the procedures under the NER, AEMO will be able to deregister, suspend or constrain the operations of an ENM.

AEMO anticipates that a number of the existing ENO businesses will become accredited as ENMs and offer these services to other embedded network owners. Many ENOs would either have or could readily develop the skills and systems required to undertake the additional tasks without

major additional costs. Many existing market participants such as retailers and network service providers (NSPs) may also be able to realise the opportunities from providing ENM services to embedded network owners.

5.3 Appointment of ENM

Under the proposed rules (to be supported by an amended AER network guideline), the AER must not grant either registrable or individual exemptions for embedded networks unless the ENO has appointed and maintains the appointment of an ENM (or is itself accredited as an ENM). Most large embedded networks would fall into these classes.

The costs of engaging the ENM would be paid by the ENO (or its agent). However the standardised procedures afforded by this proposal would most likely reduce the costs involved in the current ad-hoc processes available in some jurisdictions.

In some cases there may be additional works associated with common wiring and metering that may be required to enable a consumer within an embedded network to transfer to a contestable retailer. The regulation of this issue is a jurisdictional issue and this proposal does not address the recovery of these costs, however it is likely that there would be benefits in jurisdictions developing a common approach to these issues and costs.

The proposed rules will allow the AER to grant an exemption to the deemed class of embedded networks without a requirement for the appointment of an ENM. The deemed class covers embedded networks such as small industrial/commercial networks with fewer than ten customers, residential apartment complexes with fewer than ten customers, holiday caravan parks and other small incidental supplies.

For those jurisdictions where customers within an embedded network are fully contestable, the conditions in the AER's network guideline provide that where an embedded network customer seeks access to full retail competition, an existing deemed exemption becomes registrable. For example if a customer within an embedded network with less than ten children sought to transfer to a NEM retailer this would trigger the current requirement to register the embedded network with the AER. As part of the registration of the exemption with the AER, the ENO would need to appoint an ENM for that embedded network.

The conditions for existing exempt embedded networks are contained in the AER's current network guideline. The transition to having the functions performed by an ENM for existing embedded networks is expected to be addressed through the changes to the network guideline. During consultation on amendments to the network guideline, AEMO expects that the AER will consider the appropriate transitional period for these sites to have completed the appointment of an ENM, recognising the commercial processes that may be involved.

To assist embedded network owners/operators or controllers in appointing an ENM, AEMO will maintain a list of accredited ENMs on its website.

5.4 Key roles and responsibilities

Under the proposal the ENM would be responsible for:

- Setting up and maintaining the MSATS standing data for an embedded network;
- Ensuring that data on life support customers is maintained; and
- Compliance with the NEM processes for the transfer of customers between retailers, including from the ENO (as an exempt seller) to a registered retailer.

Distribution loss factors for child connection points within an embedded network would be determined under the arrangements contained in the AER's network guideline. In most cases this will be the loss factor calculated by the LNSP that would have applied if the customer had been connected to the LNSP's network. The network guideline does include the possibility of the

embedded network operator calculating a site specific loss factor. The ENM would be responsible for ensuring the correct loss factor code is included in the NMI standing data.

There are no changes proposed to the responsible person for the metering of the parent connection point, however, the retailer selling to on-market customers within an embedded network will be the responsible person for that site.

To ensure access to the data required for both energy and network billing purposes, both the customer's retailer and the ENM will be given access to the customer metering data for an on-market customer within an embedded network.

6 Other key issues considered

6.1 Metering arrangements

No change is proposed to the metering requirements within the NER. However it is recommended that the NEM jurisdictions harmonise their own requirements to facilitate more uniform arrangements in embedded networks.

The AER's network guideline currently requires meters to have the equivalent requirements for NEM electricity meters and to accuracy classes as stipulated in schedule 7.2 of the NER (unless otherwise exempted by the National Measurement Institute). AEMO recommends that the AER consider amending this requirement to also comply with the inspection and testing requirements of schedule 7.3 of the NER. This will minimise the potential costs of meter changes as embedded network customers change retailers.

6.2 Network charges

No changes are proposed to current network charging practices in embedded networks.

Regulation of network charging to child connection points is the domain of the AER and must be set in accordance with the network guideline.

An issue raised in the reference group related to the difficulty for retailers when quoting to embedded network customers is that the customer may currently see a bundled charge for network access and energy, with no transparency on the network component. If greater transparency in information were provided then an embedded network customer would be better placed to compare its current charges with a retailer's quote. It is recommended that the AER consider modifying its exemption conditions to ensure that embedded network customers can access information on the unbundled network and energy charges associated with their supply.

6.3 Distribution loss factors

The proposal will amend the NER to clarify current DLF practices as they apply to embedded networks.

The regulation of DLFs and their calculation is the domain of the AER and DLFs for embedded networks must be set in accordance with the network guideline.

6.4 Retailer of last resort

No changes are proposed for the retailer of last resort (RoLR) rules or procedures.

In the event that the retailer for either the embedded network or NEM customers within an embedded network fails, the standard RoLR procedures would apply and the sites would be transferred as with other customers.

The situation in which the embedded network retailer fails is covered in the AER (Retail) Exempt Selling Guideline.

6.5 Obligation to supply

There is no change to the obligation to supply arrangements as a result of the proposed design changes.

6.6 Connection point issues

To avoid terminology issues around connection points the proposed rule introduces the term “child connection point” for embedded network customers.

6.7 Disputes

If a dispute arises between an ENM and a registered participant, then, even though the ENM would not also be a registered participant, it will be deemed to be one for the purposes of the dispute resolution procedures in Chapter 8.

6.8 Grandfathering

The proposed rule changes would require all future registrable or individual exempt classes of embedded networks to appoint an ENM to perform the defined functions. For existing embedded networks that are already covered by an exemption, AEMO recommends that the AER amends the network guideline conditions to include a requirement to appoint an ENM. To allow businesses sufficient time to engage a suitable ENM, AEMO suggests that the conditions be amended to require an ENM to be appointed within two years of the commencement of the rules reflecting this design, though allowing for an earlier appointment. This will allow existing embedded network owners sufficient time to budget any additional costs and undertake the tender process to appoint an ENM or develop the systems and expertise to be accredited as an ENM themselves.

6.9 Transitional issues

AEMO considers that transitional arrangements are necessary to facilitate the introduction of the embedded networks framework.

Implementation of the proposed rule would require AEMO to make changes to existing procedures and systems. To implement the proposed rule in a timely manner, AEMO requests transitional provisions requiring it to amend the:

- MSATS procedures;
- Metrology procedures; and
- B2B procedures (in accordance with a recommendation from the Information Exchange Committee (IEC)),

to take account of the proposed rule.

The proposal also requires AEMO to develop the ENM service level procedures.

The proposed transitional rule would deem any consultation steps for the development of the new service level procedures and other relevant procedure changes prior to the rule commencement date to have been validly undertaken under the Rules consultation procedures for the purposes of the transitional requirement.

To ensure that there are ENMs available at the commencement date for the amendment, AEMO proposes that for six months following the commencement date of the proposal, existing Market Customers and Network Service Providers who notify AEMO that they wish to be ENMs are deemed to be ENMs.

6.10 Other issues raised during consultation

The reference group provided constructive criticism of the design proposal and worked co-operatively to assist AEMO develop the detailed market design for embedded networks. Most of the issues with the high level market design raised by the reference group have been addressed in the detailed market design.

Many of the fundamental concerns about the high level market design raised by participants centred on the additional costs of the proposed changes, particularly as they may apply to ENOs. In developing the detailed market design AEMO has endeavoured to minimise the costs while maintaining the integrity of the processes. Some of the key issues raised include:

- **Added costs for embedded network owners/operators or controllers to engage an ENM:** The demand from customers to seek competitive prices will continue to increase as energy prices become more material. While the embedded network owner will incur costs in contracting an ENM, a standardised and efficient approach will lead to a cheaper process for consumers in the long term. The costs of appointing an ENM (or the ENO electing to become accredited) will form part of the business case when the embedded network owner business considers the option to create an embedded network rather than opting for standard individual connections.
- **Costs to parent should a child wish to become on-market:** In some cases a child accepting a competitive offer and moving to being on-market may require a significant upgrade to the parent's metering installation. How such costs are recovered (either directly from the child or in some smeared fashion) is determined by the relevant jurisdiction and is not covered by the NER. There would be a benefit in the adoption of a uniform approach across jurisdictions.
- **Scope of functions to be covered:** Some members of the reference group wanted to add additional functions to be covered by the arrangements. All functions were considered and the minimum functions to manage customer transfer and billing are included in an effort to reduce barriers to competition without increasing costs unnecessarily.
- **Grandfathering issues:** There was much discussion in the reference group on the application of the proposed changes to existing embedded networks. It was considered that it would be an advantage if the same processes applied to all embedded networks, but to reduce implementation costs for existing embedded networks there may need to be a transitional period before they are covered by the proposed new arrangements. AEMO recommends that the details of the transitional period be considered in the AER process to amend its network guideline.
- **Billing issues:** The issue of how network charges are recovered from embedded network customers was raised. Should these be collected by the retailer and passed back to the network operator or should the ENOs bill the customer directly for network charges while the retailer charges separately for energy? This is a complicated commercial issue. It was however considered important that a customer in an embedded network has transparency on the network costs it pays. It was therefore recommended that the AER guidelines be relied upon to ensure this transparency.
- **Compliance by embedded network owners/operators or controllers:** The AER raised concerns about the governance of embedded networks, particularly in relation to the ENOs' compliance with the guidelines. While it is recognised that the current arrangements could be improved, these issues were considered beyond the scope of the current work as the current arrangements are not considered barriers to competition.
- **Excluding embedded networks from the requirements of Chapter 6 and 6A:** The AER proposed explicitly excluding embedded networks from the requirements of Chapters 6 & 6A. It is a clear policy intention that embedded networks are not to be regulated as distribution networks, but this is already covered in the NER. AEMO therefore did not consider any further amendments were required.

Further details of issues raised can be found in Appendix C.

7 Proposed rule

7.1 Description of the proposed rule

7.1.1 Chapter 2: Registered Participants and Registration

- Insert new Clauses 2.5.1(h) & (i) to prohibit the AER from granting an exemption from the requirement to be a registered network service provider unless that person appoints and maintains the appointment of an ENM. This requirement is waived for exemptions from the requirement to be a registered network service provider that are deemed to apply automatically without application to the AER.

7.1.2 Chapter 3: Market Rules

- Amend Clause 3.6.3 to clarify the calculation and application of DLFs to embedded network customers;
- Insert new Clause 3.6.3(b)(2A) defining that the DLF for connection points within an embedded network will be derived in accordance with AER exemption conditions;
- Insert new Clause 3.6.3(f1) to require the ENM to assign child connection points to the same transmission node as the parent connection point;
- Insert new Clause 3.6.3(g1) detailing that the Exempt Network Service Provider must determine DLFs for on-market child connection points for which it is required to calculate DLFs in accordance with the AER exemption conditions. Under the current network guideline this would only be for site specific DLFs. AEMO suggests that this clause be a civil penalty clause in line with the provisions of clause 3.6.3(g);
- Insert new Clause 3.6.3(g2) stating that DLFs are only required for child connection points that are, or are proposed to be, on-market;
- Insert new Clause 3.6.3(g3) to require a Network Service Provider to supply the Exempt Network Service Provider or the ENM with information reasonably required to calculate a DLF;
- Insert new Clause 3.6.3(j) to require the Exempt Network Service Provider to have DLFs calculated under clause 3.6.3(g1) approved by AER and provided to AEMO each year;
- Insert new Clause 3.6.3(k) to clarify the requirements for the determination of DLFs by excluding embedded networks from the definition of Distribution Network Service Provider for the purpose of clause 3.6.3; and
- Amend Clause 3.13.3 to require the Exempt Network Service Provider to advise AEMO of site specific DLFs.

7.1.3 Chapter 7: Metering

- Amend Clauses 7.2.2 and 7.2.3 to specify who can be the responsible person for child connection points;
- Amend Clause 7.2.8 to include ENMs in the list of people who have roles and responsibilities under the MSATS procedures and requiring ENMs to comply with these procedures;
- Amend Clause 7.2A.4 to including ENMs in the list of people who have roles and responsibilities under the B2B procedures and requiring ENMs to comply with these procedures;

- Amend Clause 7.7 to recognise that both ENMs and ENOs are entitled to access energy data or to receive metering data, NMI Standing Data, settlements ready data or data from the metering register for a metering installation;
- Amend Clause 7.14.1 to require the metrology procedures to include obligations for ENMs;
- Insert new Clause 7.16.1 providing that the embedded network management functions must be carried out only by an ENM. AEMO suggests that this clause be a civil penalty clause;
- Insert new clause 7.16.2 to confirm that any person may apply to AEMO to be accredited as an ENM. Only people who meet the requirements of schedule 7.7 can be accredited as an ENM. Accredited ENMs are required to comply with the provisions of the NER and the ENM service level procedures;
- Insert new Clause 7.16.3 requiring AEMO to establish, maintain and publish the ENM service level procedures and detailing those items which must be included in these procedures;
- Insert new Clause 7.16.4 requiring AEMO to publish details of the procedures for the deregistration of ENMs and detailing the principles to be incorporated in those procedures;
- Insert new Clause 7.16.5 requiring AEMO to publish a list of accredited ENMs;
- Insert new Clause 7.16.6 requiring the ENM to maintain details of the electrical wiring of the metering installations within the embedded network and to make this information available to those who have a need for it;
- Insert new Clause 7.16.7 requiring AEMO to develop and publish a guide to embedded networks; and
- Insert new schedule S7.7 requiring AEMO to establish a qualification process for the accreditation of ENMs and detailing the capabilities of ENMs.

7.1.4 Chapter 8: Administrative Functions

- Amend Clause 8.2.1 to deem the ENM to be a market participant for the purposes of dispute resolution under Clause 8.2.

7.1.5 Chapter 10: Glossary

- Inserting and amending terms as used in the proposed rules.

7.1.6 Chapter 11: Savings and Transitional Rules

- Insert new Clause 11.68 to the effect that any action taken by AEMO or the Information Exchange Committee prior to the commencement date to consult on the development of the ENM service level procedures or amendment of the metrology procedures, MSATS procedures or B2B procedures is taken to satisfy the requirements of the Rules consultation procedures;
- Clause 11.68 also deems existing Market Customers and Network Service Providers who have notified AEMO that they wish to be accredited as ENMs to be ENMs, while subjecting them to the provisions of Clause 7.16.4. This rule would ensure that there are ENMs available at the commencement date for the amendment and would only apply for a period of 6 months following the commencement date of the amendments, after which anyone wishing to become an ENM would need to go through the accreditation process.

7.2 Draft of the proposed rule

AEMO has prepared a draft rule based on version 64 of NER and this is included in Appendix A.

8 Consequential changes

8.1 Procedures

AEMO or the Information Exchange Committee (as appropriate) will need to consult on and make changes to existing procedures and systems to reflect the changed design and transitional matters. Amendments are expected to be applied to:

- MSATS procedures;
- Metrology procedures;
- B2B Procedures;
- NMI procedure;
- NMI standing data document; and
- Service level procedures - Metering data provider services categories D and C for Metering Installation Types 1, 2, 3, 4, 5, 6 and 7.

In amending these procedures, AEMO and the Information Exchange Committee will be required to follow the Rules consultation procedures in clause 8.9 of the NER.

8.2 AER guidelines

Implementation of the proposed rule and AEMO's proposed solution would require the AER to impose certain conditions on exempt ENOs:

- Require the embedded network owner/operator or controller to appoint an ENM;
- Allow the AER to exempt certain categories of embedded networks from this requirement;
- Establish transitional arrangements for existing exempt embedded networks;
- Specify that the ENO is responsible for the costs incurred on its behalf by the ENM;
- AER to approve site specific DLFs for any embedded network customers as required by the exemption conditions or requesting by the customer; and
- ENO to provide site specific embedded network loss factors to AEMO for publication.

Other recommendations for AER:

- Standardise metering arrangements by requiring routine testing and inspection of off-market child meters; and
- Ensure that customers in embedded networks have transparency with respect to their network and energy charges.

8.3 Jurisdictional arrangements

To ensure the full benefits of the proposed changes are realised it may be necessary for some jurisdictions to amend their rules around embedded networks to provide for the consistent application of the proposed changes.

The proposal should allow those jurisdictions that currently do not permit customers within embedded networks to seek competitive offers from NEM retailers to encourage competition.

Jurisdictions may also wish to consider harmonising the rules relating to the recovery of the costs incurred by the parent from the transfer of a child to become on-market.

9 How the proposed rule contributes to the National Electricity Objective

Before the AEMC can make a rule change it must apply the rule making test set out in the NEL, which requires it to assess whether the proposed rule will or is likely to contribute to the National Electricity Objective (NEO). Section 7 of the NEL states the NEO is:

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

The new arrangements should contribute to the achievement of the NEO by increasing the range of competitive electricity products and services available to consumers within embedded networks. This will enhance the ability of consumers to manage their electricity consumption and costs, so that investments in and operation and use of electricity services are more efficient.

The proposed arrangements will clarify the roles and responsibilities in relation to embedded networks and reduce the barriers to consumers accessing offers from competing market participants. Clarifying the arrangements will facilitate a more consistent approach across the NEM, reducing the duplication of processes and procedures and the costs involved in customer transfers. The increased regulatory certainty is expected to reduce the barriers for retail entry and encourage more willing providers.

The clarity of roles provided by this proposal should allow jurisdictions to harmonise their local rules and procedures and provide uniformity across the NEM, including in those jurisdiction that do not currently permit customers within embedded networks to seek competitive prices.

These changes will allow market participants and embedded network operators to use the NEM systems with respect to embedded network customers. Transaction costs and information barriers will be reduced. This will decrease the costs to serve embedded network customers seeking competitive offers and will lead to increased competition for these customers.

The requirement for the appointment of an ENM to undertake the range of roles and tasks identified will allow the cost of providing competitive electricity services to embedded network customers to be allocated appropriately. Duplication of effort and the need to use ad-hoc processes should be minimised and the overall cost of serving embedded network customers will be reduced.

Ultimately consumers will see benefits in the form of increased choice of retailer and potentially lower prices. Greater competition typically fosters innovation, which may increase the range of products and services available to embedded network customers. Such innovation should lead to improved efficiency in the supply of electricity to those customers and the management of embedded networks.

The result will be improved market efficiency (efficient investment in new electricity services and products) to achieve the NEO.

10 Expected benefits and costs of the proposed rule

AEMO engaged Jacobs SKM to undertake the MTREN cost benefit assessment based on the initial high level market design. AEMO collected cost estimates for the implementation and ongoing operation of the arrangements from a cross section of retailers and network service providers. AEMO also provided Jacobs SKM with an estimate of its costs to implement its business processes and IT systems. Jacobs SKM reviewed the cost estimates provided and these were used as the basis of the anticipated costs of the arrangements. However, no work was undertaken by either Jacobs SKM or AEMO to verify the cost estimates collected.

The high level design used for the cost estimates gave participants a guide for costing purposes, but it did include a number of options for the implementation of the proposal and lacked clarity as to how the various roles would be undertaken. The cost estimates provided showed both high

implementation costs and high ongoing costs. The responses indicated that this was being driven by both extensive updates being required to systems and significant manual work that might still be required to support the high level market design. AEMO recognises the possibility that the cost estimates provided by participants were conservative to account for the uncertainty of the final design.

The detailed market design places the key embedded network customer management obligations onto the ENM and requires the use of existing MSATS and B2B processes. This will allow much of the work in identifying and transferring customers within embedded networks to be automated and the solution can be implemented and maintained at a lower overall cost than originally estimated. AEMO has not re-visited the cost benefit analysis to quantify these savings.

Jacobs SKM employed a range of modelling tools to estimate the potential benefits that could be realised. The report considers both the economic benefits and the competition benefits of the proposed changes.

A copy of the Jacobs SKM final report is included as Appendix D. The key findings of that report as it relates to embedded networks are as follows:

- The net present value of implementing the high level market design for embedded networks is -\$3 million and \$19 million over a 10 and 20 year period, respectively (recognising that this is based on potentially high estimates of costs and as such the net benefits could be understated); and
- The proposed changes for embedded network have the potential to provide regulatory certainty by formalising roles, responsibilities and arrangements in the national regime; minimise differences between jurisdictions; and encourage the introduction of competition and competitive pricing in embedded networks in jurisdictions where this is currently not available.

	To 2020 (\$ million)	To 2035 (\$ million)
Benefits	103	165
Costs	107	146
Net benefits	-3	19

The market benefits for embedded networks are positive by 2035. The majority of these benefits are associated with improvements in competition in the retail sector and as such the results are not sensitive to assumptions around future changes in overall demand or the uptake of new smart technologies.

The analysis is based on a conservative assumption that there are currently around 500 embedded networks with end use customers that are likely to consider competitive retail offers if they become eligible to do so.⁷ It further assumes minimal growth in the number of these embedded networks. This is a very conservative assumption as further information indicates that the number of embedded networks is growing. As such the benefits identified may also be understated and additional benefits are likely to be achieved in practice.

Efficiency gains arising from the proposed rule changes may ultimately lead to more competitive outcomes by allowing retailers to compete better to supply portions of the embedded loads (say overnight loads, at sites with cogeneration), leading to a more efficient allocation of resources devoted to generation of electricity and possibly leading to improvements of network productivity.

Allowing embedded network customers to access alternative retailers would also lead to enhanced competition, which may result in to lower electricity prices for those consumers.

⁷ It is not anticipated that very small embedded customers such as those within caravan parks would consider competition

Increased competition is also likely to drive down retail margins, delivering a wealth transfer from retailers and some customers. While this may not be a true economic benefit, it is likely to result in reduced prices to consumers and therefore lead to a greater achievement of the NEO.

AEMO is aware that the AEMC's Power of Choice review contained a number of other recommendations, many of which are being progressed through rule change processes. AEMO considers that there may be potential synergies in the timing of the changes, particularly how these might be related to the costs of software systems changes.

Terms or Abbreviations

TERM OR ABBREVIATION	EXPLANATION
AEMC	Australian Energy Market Commission
AEMC reports	AEMC final advice on Energy Market Arrangements for Electric and Natural Gas Vehicles and Power of Choice final report ⁸
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
B2B	Business to Business
child	refers to a customer connection point within an embedded network
COAG	Council of Australian Governments
DLF	Distribution loss factor
ENM	Embedded network manager
ENO	Embedded network owner, operator or controller
FRMP	Financially responsible Market Participant
LNSP	Local network service provider
MDP	Metering data provider
MP	Meter provider
MSATS	Market Settlement and Transfer Solutions
MTR	Multiple trading relationships
MTREN	multiple trading relationships and embedded networks
NEL	National Electricity Law
NEM	National electricity market
NEO	The national electricity objective as stated in section 7 of the NEL
NER	National Electricity Rules
NMI	National metering identifier
NSP	Network service provider
Off-market customer	Embedded network customer purchasing electricity from exempt on-seller
On-market customer	Embedded network customer buying electricity from a NEM retailer
parent	refers to the connection point between the embedded network and the LNSP's network
RoLR	Retailer of last resort
RP	Responsible person
SCER	Standing Council on Energy and Resources (now called COAG Energy Council)
SGA	Small generator aggregator

⁸ See notes 1 and 2.

Appendix A – Rule change drafting

Appendix B – Embedded networks – detailed market design

Appendix C – Table of issues raised by participants

Appendix D – Jacobs SKM cost benefit report