Australian Energy Market Commission

RULE CHANGE

DRAFT RULE DETERMINATION

National Electricity Amendment (Connecting Embedded Generators) Rule 2013

Rule Proponent(s)

Property Council of Australia
Seed Advisory
ClimateWorks Australia

27 June 2013

For and on behalf of the Australian Energy Market Commission

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About the AEMC

The Council of Australian Governments (COAG), through its then Ministerial Council on Energy (MCE), established the Australian Energy Market Commission (AEMC) in July 2005. In June 2011, COAG established the Standing Council on Energy and Resources (SCER) to replace the MCE. The AEMC has two main functions. We make and amend the national electricity, gas and energy retail rules, and we conduct independent reviews of the energy markets for the SCER.

Summary

The Commission has made a draft rule establishing a clear framework for embedded generation proponents to connect to a distribution network. This framework includes a multi-stage connection process and the specification of information to be provided by distributors to potential connection applicants. It also requires distributors to provide information about the technical requirements of connecting to a distribution network.

The draft rule sets out detailed regulatory requirements for both connection applicants and distributors. For distributors, compliance with the new requirements will come at some additional cost. However, the obvious difficulties being faced by embedded generators trying to connect under the current framework make this increase in regulation appropriate and in the long term interests of consumers who would benefit from efficient investment in embedded generation.

The Commission considers that the draft rule will contribute to the achievement of the national electricity objective by establishing a clearly defined process for embedded generation connections. This will support the efficient investment in, and operation of, distribution networks. The draft rule also provides for greater transparency and information regarding the decision making process of distributors when considering the potential connection of embedded generators. This in turn will assist potential embedded generator proponents in their business decisions and enable them to put forward well informed proposals to distributors. Over time, the Commission anticipates that the new framework will provide for an efficient process to consider, develop and deliver embedded generation projects that benefit all parties, including, in the long term, consumers.

The draft rule has been made in response to a rule change request submitted by ClimateWorks Australia, Seed Advisory and the Property Council of Australia on 18 April 2012. The rule change request sought to amend Chapter 5 of the National Electricity Rules to enable embedded generators to connect to distribution networks. It brought to the Commission's attention a number of significant issues about the current connection framework as well as the particular needs of embedded generation proponents.

The Commission's draft determination

The Commission's draft determination is to make a more preferable draft rule (draft rule). The draft rule reflects many of the issues raised by the proponents in their rule change request. It also reflects the Commission's careful consideration of issues raised by other stakeholders. In addition, the draft rule includes a number of amendments to clarify the application and operation of the rule, particularly in relation to the connection process. The key features of the draft rule are:

- Information pack: each distributor is to publish an 'information pack' setting out information to guide connection applicants on the process requirements; provide example costs; and a model connection agreement. The information pack will

improve the clarity and transparency of the connection requirements and allow connection applicants to more effectively participate in the connection process.

- Enquiry process: a new two-stage connection enquiry process of a preliminary enquiry stage followed by a detailed enquiry stage. For connections that do not require shared network augmentation, the detailed enquiry is to be completed within three months. These provisions are to improve the timeliness and certainty of connection enquires.

- Application process: under a revised connection application process, for connection applications based on 'agreed projects', a distributor will be required to make a connection offer within 20 business days. The 20 business day limit will provide certainty to connection applicants.

- Technical information: in the absence of automatic or minimum access standards for embedded generators for the National Electricity Market, distributors are to publish a register of generating plant that meets their minimum technical requirements. This will increase transparency and allow connection applicants to better understand the relevant requirements in connecting to a distribution network.

- Expert appraisal process: the introduction of an expert appraisal process will allow connection applicants or distributors to appoint an independent engineer to assist in the assessment of the reasonableness of any technical requirements and aid in the resolution of technical disputes. The costs of an independent engineer will be shared equally by the connection applicant and distributor.

- Enquiry fee: distributors will be able to charge an enquiry fee for preparing detailed enquiry responses. The enquiry fee is to recover the reasonable costs incurred by a distributor. This differs from the consultancy style 'fee-for-service' arrangements proposed under the rule change request. Connection applicants can already enter into commercial arrangements with distributors for such services. This option has not been removed by the draft rule.

- Exporting to the grid: there are no changes to provide embedded generators with the automatic right to export electricity into the connected distribution network. Whether the network is able to safely and reliability accommodate electricity exported by embedded generators will need to be assessed during the connection application process. However, distributors are already required to use reasonable endeavours to provide an applicant with the access arrangements they seek.[1]

- Shared network augmentation costs: there are no changes to exempt embedded generators from contributing to shared network augmentation costs. Appropriate price signals would be achieved by allocating costs to parties that benefit from a

1 Embedded generators also have the ability use excess electricity to supply local load customers or the local retailer. They also have the ability to export electricity to the grid where they are registered with AEMO as a market generator.

service. Also, if embedded generators were exempt from contributing to shared network augmentation costs, other users of the network would have to bear these costs.

Reasons for the Commission's draft determination

Having regard to the issues raised by the rule change request, the Commission's draft determination is to make a draft rule. The Commission is satisfied that the draft rule will, or is likely to, better contribute to the NEO for the following reasons:

- The draft rule will provide a clearer connection process for embedded generation proponents and distributors compared to the proposed rule. It does this because it includes obligations on both parties as well as the key timeframes within which to achieve outcomes. The draft rule provides a two-stage process to better meet the needs of connection applicants and distributors. The connection application process is also amended to provide a more efficient, 'fast track' process for projects that have been agreed to during the enquiry stage.

- The draft rule provides greater clarity on the provision of information (including cost information) that is to be provided by distributors than the proposed rule. The draft rule supplements and builds upon existing information requirements to improve the availability and transparency of information that would assist connection applicants before and during the connection process.

- The draft rule allows for the development of relevant technical standards for connecting embedded generators compared to the proposed rule which did not (although it was an issue raised in the rule change request). In addition, the draft rule requires distributors to provide information on the technical requirements relating to the connection of embedded generators. This will aid in improving the efficiency and effectiveness of the connection process.

Invitation for submissions

The Commission invites written submissions on this draft rule determination, including the draft rule, by 8 August 2013. The Commission will consider submissions on the draft rule determination and publish its final rule determination by 19 September 2013.

Contents

1 ClimateWorks Australia, Seed Advisory and the Property Council of Australia's rule change request

1.1 The rule change request

On 18 April 2012, ClimateWorks Australia, Seed Advisory and the Property Council of Australia (collectively, the proponents) made a request to the Australian Energy Market Commission (Commission or AEMC) to make a rule regarding the process for the connection of embedded generators to distribution networks in the National Electricity Market (NEM) (rule change request).

Specifically, the proponents have suggested a number of amendments to Chapter 5 of the National Electricity Rules (NER) to address their concerns about the current requirements and processes relevant to connecting embedded generators to distribution networks. The rule change request includes a proposed rule.

The rule change request has drawn on the proponents' September 2001 joint report *Unlocking barriers to cogeneration: project outcomes report*.

1.2 Rationale for rule change request

In this rule change request, the proponents seek to amend the existing framework for connecting embedded generators with a capacity between 10kW and 30MW to a relevant distribution network. The proponents claim that amendments are needed because the NER is insufficient to facilitate cost effective and timely connections. In particular, the proponents have identified a number of 'regulatory gaps' that have resulted in the connection process being conducted on a case-by-case basis, rather than any standardised or common approach across the NEM.

The problems identified by the proponents fall into three broad categories: the connection process, technical requirements and cost.

Connection process and terms & conditions

The proponents consider that, although there are connection processes under Chapters 5 and 5A of the NER, they are not sufficiently prescriptive to provide certainty to connection applicants. In particular, the proponents have stated that there is uncertainty with respect to whether applications would be successful, the timeframe within which applications would be considered and the overall costs of connection. The proponents note that the connection process can result in significant delays to embedded generation projects.[2]

The proponents also note that the terms and conditions for connection can vary significantly between distribution network service providers (DNSPs). The absence of

2 Rule change request, p11.

standard terms and conditions are considered to increase the difficulty with which embedded generators are able to anticipate the requirements and costs associated with connection. The proponents also contend that the terms of connection agreements are frequently 'onerous, one sided and not negotiable'.[3]

Technical requirements

Technical requirements or standards for distribution networks are determined in accordance with jurisdictional and local requirements. As a result, the technical standards that apply to embedded generator connections vary between distributors. The proponents consider that at times these technical requirements 'are not clearly and comprehensively identified at the beginning of the connection process'. Consequently, these requirements can result in 'significant costs and undermine the viability' of a project as it impacts the ability of the embedded generator to make relevant commercial decisions.[4]

The proponents also note that 'some technical requirements imposed by DNSPs disallow exports of electricity to the grid'.[5] This can impact project proponents' options with regards to viable solutions they can implement and has resulted in project proponents installing generators they consider are not scale efficient.

Connection and augmentation costs

Depending on the specific requirements of the connection application and the relevant jurisdictional provisions, embedded generators could be required to contribute to costs to augment the shared network arising from their connection to the distribution network. The proponents consider there is 'a lack of clarity and transparency regarding responsibility for, need for and the costs of augmentation to the network'. They further note that, at times, the costs associated with a connection could be 'prohibitively expensive'.[6]

1.3 Solution proposed in the rule change request

To address the issues they have identified, the proponents propose a number of amendments to Chapter 5 of the NER intended to apply to DNSPs and embedded generators in the 10kW to 30MW size range. The rule change request includes a proposed rule.

Broadly, the rule change request proposes to address the following:

- **Connection process and terms and conditions** - amend the connection process to have more prescriptive timeframes for DNSPs to provide responses; require

3 ibid, p13.

4 ibid, p12.

5 ibid

6 ibid, p13.

DNSPs to publish standard information requirements; and require DNSPs to set out standard terms for embedded generation connections.

- **Technical requirements** - introduce an automatic access standard for embedded generators (although the content of such a technical standard has not been included in the rule change request or proposed rule) and give embedded generators the right to export electricity to the distribution network.

- **Connection and augmentation costs** - exclude embedded generators from paying shared network augmentation costs; allow network service providers the option to charge a fee-for-service to provide services to embedded generation proponents at the project development stage.

- **Other changes** - require DNSPs to publish annual network reports[7] and make various other consequential amendments.

1.4 Relevant background

The rule change request, either directly or indirectly, raises a number of issues relevant to work carried out by the AEMC or other organisations. These include:

- the AEMC's Transmission Frameworks Review. This review was concerned with the interface between transmission and generation. It included consideration of how generators connect to the transmission network. The Commission recommended an approach to increase competition and transparency in the construction of the assets required for generator connections to transmission. It is anticipated that it will result in a closer alignment of generation and transmission investment and, ultimately, minimise prices for electricity consumers in the longer term by minimising the total system cost of building and operating generation and transmission. A final report was published on 11 April 2013.

- the AEMC's Power of Choice Review. This review was concerned with reforms aimed at providing consumers greater opportunity to make informed choices based on the benefits that end use services provide. The AEMC's proposed recommendations included: encouraging commercial investment in the technology that enables flexible pricing options and other demand side participation products; incentives for NSPs to consider demand side projects in lieu of infrastructure investments; and allowing consumers to sell energy they generate to parties other than their retail electricity supplier. A final report was published on 30 November 2012.

- the distribution network planning and expansion framework rule change. On 11 October 2012 the AEMC made a final rule establishing a national framework for

7 The proponents acknowledged that the requirement for DNSPs to publish annual reports was being considered under the distribution network planning and expansion framework rule change at the time of lodgement. The proponents considered that the proposed rule under the network planning rule change would address their requirements.

distribution network planning and expansion. This included new demand side obligations on DNSPs to develop and document a demand side engagement strategy and engage with non-network providers. In addition, DNSPs are now also required to publish an annual planning report that includes information on demand forecasts and system limitations.

- the Department of Resources, Energy and Tourism (DRET) is currently working on the feasibility of developing mid-scale embedded generation connection standards. An interim report prepared by its consultant, AECOM Australia, in April 2013 examined the feasibility of developing Australian technical standards for the connection of embedded generators (of 30kW to 5MW in size) to distribution networks.

1.5 Commencement of rule making process

On 14 June 2012, the Commission published a notice under s. 95 of the National Electricity Law (NEL) advising of its intention to commence the rule making process and the first round of consultation in respect of the rule change request. A consultation paper prepared by the AEMC identified specific issues and questions for consultation which was also published at this time. Submissions closed on 9 August 2012.

The Commission received 43 submissions on the rule change request as part of the first round of consultation. The submissions are available on the AEMC website (www.aemc.gov.au). A summary of the issues raised in submissions, and the Commission's response to each issue, is contained in Appendix A.

1.6 Extension of time

On 18 October 2012, the AEMC published a notice under s. 107 of the NEL extending the period of time in which it must make a draft rule determination on the connecting embedded generators rule change request. This extension of time was made to allow the AEMC to fully consider the many issues raised by the broad range of stakeholders that responded to the AEMC's consultation paper. In addition, the time extension has provided for additional consultation with the proponents and other stakeholders in the form of meetings and, on 13 March 2013, a workshop to discuss the connection process. As a result of this time extension the AEMC must make its draft rule determination by 27 June 2013.

1.7 Consultation on draft rule determination

In accordance with the notice published under s. 99 of the NEL, the Commission invites submissions on this draft rule determination, including the draft rule, by Thursday 8 August 2013.

In accordance with s. 101(1a) of the NEL, any person or body may request that the Commission hold a hearing in relation to the draft rule determination. Any request for

a pre-determination hearing must be made in writing and must be received by the Commission no later than Thursday 4 July 2013.

Submissions and requests for a hearing should quote project number "ERC0147" and may be lodged online at www.aemc.gov.au or by mail to:

Australian Energy Market Commission
PO Box A2449
SYDNEY SOUTH, NSW, 1235

2 Draft rule determination

2.1 Commission's draft determination

In accordance with s. 99 of the NEL, the Commission has made this draft rule determination in relation to the rule proposed by ClimateWorks Australia, Seed Advisory and the Property Council of Australia.

The Commission has determined it should not make the rule proposed by the proponent. Rather, it has decided to make a more preferable draft rule (referred to in this draft determination as 'the draft rule').[8] The draft rule addresses many of the issues raised by the proponents and other stakeholders. It also makes a number of amendments to improve the clarity and application of the rule.

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

The draft rule is attached to, and published with, this draft rule determination. Its key features are described in detail in Chapters 5 to 7. The draft rule also includes a number of provisions that are necessary or consequential (as permitted by s. 91B of the NEL). However, transitional provisions (as discussed in Chapter 8) have not been included in the draft rule. These will be included in the final rule.

2.2 Commission's considerations

In assessing the rule change request, the Commission considered:

- the Commission's powers under the NEL to make the draft rule determination;
- the rule change request;
- submissions received during the first round of consultation;
- feedback from stakeholders during the workshop on a draft connection process; and
- the Commission's analysis as to the ways in which the proposed rule will or is likely to, contribute to the NEO.

8 Under s. 91A of the NEL the AEMC may make a rule that is different (including materially different) from a market initiated proposed rule (a more preferable rule) if the AEMC is satisfied that having regard to the issue or issues that were raised by the market initiated proposed rule (to which the more preferable rule relates), the more preferable rule will or is likely to better contribute to the achievement of the national electricity objective.

There is no relevant Ministerial Council on Energy (MCE) statement of policy principles relating to this rule change request.[9]

2.3 Commission's power to make the rule

The Commission is satisfied that the draft rule falls within the subject matter about which the Commission may make rules as set out in s. 34(1)(a)(iii) of the NEL. That is, regulating "the activities of persons (including registered participants) participating in the national electricity market or involved in the operation of the national electricity system".

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

- item 11 – the operation of generating systems, transmission systems, distribution systems or other facilities;
- item 12 – the augmentation of transmission systems and distribution systems; and
- item 13 – access to electricity services provided by means of transmission systems and distribution systems.

2.4 Rule making test

Under s. 88(1) of 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 NEO. This is the decision making framework that the Commission must apply.

The NEO is set out in s. 7 of the NEL as follows:

> "The objective of this Law 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, safety, reliability and security of supply of electricity; and
>
> (b) the reliability, safety and security of the national electricity system."

For the rule change request, the Commission considers that the relevant aspects of the NEO are:[10]

9 Under s. 33 of the NEL, the AEMC must have regard to any relevant MCE statement of policy principles in making a rule.

- efficient investment in distribution networks;
- efficient operation in distribution networks; and
- efficient use of electricity services.

The Commission is satisfied that the draft rule will, or is likely to, contribute to the achievement of the NEO by providing clearly defined, nationally consistent arrangements which will support more efficient outcomes, particularly in terms of investment in and operation of distribution networks, than the current arrangements.

As identified by the rule change request, mid-sized embedded generators are the focus of this draft rule. In maintaining this focus, the Commission acknowledges that, in some instances, these embedded generation proponents have faced difficulties in negotiating access to a distribution network. Many embedded generation proponents are relatively inexperienced in the details and operation of the NER — the regulatory framework surrounding the electricity market is not a core aspect of their business. In contrast, the DNSPs have an extensive understanding of the NER as it is an important part of the environment in which they operate. However, not all DNSPs are equally familiar with the operation and needs of embedded generators. As a result, the Commission has concluded that there is a need to improve the operation and clarity of certain aspects of Chapter 5 of the NER. Specifically, there is a need to reduce the barriers (for both embedded generation proponents and DNSPs) to allow for the efficient connection of embedded generators to distribution networks.

This will promote the long term interests of consumers in respect of the price of electricity services. In particular:

- by ensuring that potential embedded generators have the best information available, these parties will be able to make well informed decisions about connecting to a distribution network (promoting efficient investment in distribution networks and efficient use of electricity services); and
- by ensuring that potential embedded generators and DNSPs have a clearly defined process to plan and develop the connection of embedded generators to a distribution network (promoting efficient operation of, and investment in, distribution networks).

If implemented, there will be some costs associated with the introduction of the draft rule. DNSPs will be required to make certain information available publicly and, as part of a connection enquiry process, to prospective connecting embedded generators. Implementation of these provisions will come at some cost to DNSPs. However, in part, the provision of information will build on requirements already in place in the NER as well as current practices. In addition, in some instances embedded generation

10 Under s. 88(2), for the purposes of s. 88(1) the AEMC may give such weight to any aspect of the NEO as it considers appropriate in all the circumstances, having regard to any relevant MCE statement of policy principles.

proponents may be required to pay an enquiry fee to DNSPs. However, these costs are outweighed by the benefits of a clearer, more streamlined process that guides parties through the development of an embedded generation project in a timely manner.

Under s. 91(8) of the NEL, 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 Australian Energy Market Operator (AEMO)'s declared network functions. The draft rule is compatible with AEMO's declared network functions because it is unrelated to AEMO's declared network functions.

2.5 More preferable rule

Under s. 91A of the NEL, the AEMC may make a more preferable rule that is different (including materially different) from a market initiated proposed rule if the AEMC is satisfied that, having regard to the issues or issues that were raised by the market initiated proposed rule (to which the more preferable rule relates), the more preferable rule will or is likely to better contribute to the achievement of the NEO.

Having regard to the issues raised by the rule proposed and the rule change request, and other requirements under the NEL, the draft rule is a more preferable rule. The Commission is satisfied that the draft rule will, or is likely to, better contribute to the NEO for the following reasons:

- The draft rule will provide a clearer connection process for embedded generation proponents and DNSPs compared to the proposed rule. It does this because it includes obligations on both parties as well as the key timeframes within which to achieve outcomes. The draft rule amends the Chapter 5 enquiry process by providing a two-stage process to better meet the needs of connection applicants and DNSPs. The connection application process is also amended to provide a more efficient, 'fast track' process for projects that have been agreed to during the enquiry stage.

- The draft rule provides greater clarity on the provision of information (including cost information) that is to be provided by DNSPs than the proposed rule. The draft rule supplements and builds upon existing information requirements in the NER to improve the availability and transparency of information that would assist connection applicants before and during the connection process.

- The draft rule accommodates the future development of relevant technical standards for connecting embedded generators compared to the proposed rule which did not (although it was an issue raised in the rule change request). In addition, the draft rule requires a DNSP to create and maintain a register of generating plant that meets its minimum access requirements. This is to ensure that the technical requirements relating to the connection of specific embedded generators are provided to interested parties subject to locational limitations.

3 Commission's reasons

The Commission has analysed the rule change request and assessed the issues arising from it. For the reasons set out below, the Commission has determined that the draft rule be made. Its analysis of the proposed rule and the differences between the proposed rule and the draft rule are set out below.

3.1 Assessment of issues

In submitting the rule change request the proponents have sought to establish a clearer, more certain and efficient process for connecting embedded generators to distribution networks. Ultimately, the proposed rule was aimed at encouraging the development of embedded generation "without compromising the integrity of the national electricity grid".[11]

3.1.1 Current arrangements

Connection process

The current provisions of the NER require DNSPs to make available certain information either publicly or to parties seeking connection to the distribution network. Specifically, DNSPs are required to develop and publish a demand side engagement document, which is to set out information including the description of how DNSPs engage with non-network proponents (such as embedded generators) and the process for lodging connection applications.[12] DNSPs are also required to publish annual reports of their planning activities in a distribution annual planning report (DAPR) including information on forecast demand and network limitations.[13] The NER also sets out the minimum terms and conditions that apply to connection agreements.[14]

The NER currently provides a single stage connection enquiry process. Schedule 5.4 sets out the information that is to be included in a connection enquiry. On receiving an enquiry, a DNSP has 20 business days to respond. The response is to include relevant technical details and the information that must be submitted in a connection application.[15]

Following this, connection applicants are to submit applications that include the information as specified by the DNSP in its enquiry response. Where applicable, the connection applicant is responsible for providing a proposed negotiated access standard with its application. Where the application includes a negotiated access

11 Rule change proposal, p7.

12 Clause 5.13.1(h) and Schedule 5.9 of the NER.

13 Rule 5.13 and Schedule 5.8 of the NER.

14 Schedule 5.6 of the NER.

15 Clauses 5.3.2 and 5.3.3 of the NER.

standard that the DNSP has accepted, the DNSP must make a connection offer that is fair and reasonable.[16]

Technical standards

The NER provisions regarding the technical requirements about the connection of registered participants (including embedded generators, unless provided otherwise) are located in a number of schedules to Chapter 5. In brief, these are:

- Schedule 5.1 outlines, among other things, the requirements on network service providers (NSPs) to develop consistent processes to determine the appropriate technical requirements to apply for each connection enquiry or application with the objective that all connections satisfy the requirements of this schedule;
- Schedule 5.1a outlines the system standards that are necessary or desirable for the safe and reliable operation of the facilities of registered participants and for the safe and reliable operation of equipment;
- Schedule 5.2 sets out the conditions for connection of generators. For those embedded generation systems less than 5MW and exempt from registration with AEMO, this schedule would be unlikely to apply;
- Schedule 5.3 sets out details of the requirements and conditions that customers must satisfy as a condition of connecting load to a network. This will apply to embedded generators because they also tend to be load customers;
- Schedule 5.4 identifies the information required to be submitted with a preliminary enquiry for connection or modification of an existing connection;
- Schedule 5.5 lists the range of technical data which may be required to be provided by connection applicants to a NSP. The actual data required will be advised by the NSP and will form part of the technical specification in the connection agreement;
- Schedule 5.6 sets out the specific conditions that connection agreements must contain about connection and access to a distribution network;
- Schedule 5.7 sets out the information for each connection point that must be provided to the relevant NSP by each registered participant that has a connection point to a transmission network of that NSP.

Connection charges and shared augmentation costs

Currently, Chapter 5 of the NER enables DNSPs to charge a connection applicant an application fee which is payable on lodgement of an application to connect. Clause

16 Clauses 5.3.5(a), 5.3.6(a), 5.3.6(c).

5.3.3(c)(5) states that the amount of this application fee should not be more than necessary to cover the reasonable costs of all work anticipated to arise from investigating the application and preparing the associated offer to connect.

The application fee arises from clause 5.3.3(c), which specifies that written advice from the NSP to the connection applicant must include all further information that the connection applicant must prepare and obtain in conjunction with the NSP to enable the NSP to assess an application to connect. That is, this written advice must contain details of any application fee that the NSP may charge. However, this clause does not require the NSP to publish the application fee on its website.

In respect of the fee-for-service arrangement in the proposed rule, there are currently no provisions in the NER relating to this type of service.

The current arrangements in the NER that relate to the itemised statement of connection charges outlined in the proposed rule are set out in Schedule 5.6. This schedule identifies the proposed terms and conditions that must be contained in a connection agreement. Schedule 5.6(b) relates to metering arrangements, and Schedule 5.6(d) refers to connection service charges. While the NER is not explicit in how the DNSP is to provide this information to the connection applicant, the connection agreement should contain information of the sort in the proposed rule. The itemised statement of connection charges in the proposed rule contains essentially the same items as those contained in clause 5A.E.2 of Chapter 5A of the NER.[17]

Under the NER, embedded generators are not exempt from paying for the cost of augmentation of the distribution network. This applies to connections under Chapter 5 and Chapter 5A. For example, under clause 5.3.5(d) of the NER, a DNSP must assess an application to connect so as to maintain the levels of service and quality of supply to existing registered participants in accordance with the NER. That is, the DNSP must consult with AEMO and other registered participants with whom it has connection agreements when preparing an offer to connect. Where the DNSP believes, in its reasonable opinion, that compliance with the terms and conditions of those connection agreements will be affected, it must assess the connection application and determine:

- the technical requirements for the equipment to be connected;
- the extent and cost of augmentations and changes to all affected networks;
- any consequent change in network service charges; and
- any possible material effect of this new connection on the network power transfer capability including that of other networks.

17 This clause obliges DNSPs to provide the connection applicant with a connection offer accompanied by a schedule containing an itemised statement of connection costs of the types set out in the proposed rule.

The provisions relating to the cost of augmentation of the network are similar under Chapter 5A of the NER. Clause 5A.C.3 outlines a negotiation framework between a DNSP and a connection applicant for that chapter.

3.1.2 Proposed rule

Connection process

To assist connection applicants, the proponents have proposed that DNSPs be required to publish information including: a description of how an application for a new connection is to be made; a description of the connection process; an identification of the information that must be submitted with an application to connect; and the basis for the calculation of connection charges.[18] The proposed rule outlined specific items to be published by DNSPs upfront including a description of how connection applications are to be made.

The proponents considered the current connection process could be burdensome, time-consuming and costly for small generators.[19] It was also suggested that some DNSPs have not always promptly responded to connection enquiries. In this regard, the current 'propose and respond' process does not provide satisfactory outcomes for connection applicants.[20] Despite these concerns, the proposed rule did not seek to amend the connection enquiry process itself.

The proponents commented that there were no binding timeframes under the current connection application process. In their view, this has led to situations where there has been a misalignment between the project proponent's requirements and a DNSP's connection process.[21] This misalignment of timeframes has resulted in significant additional costs to project proponents.[22] Consequently, the proponents proposed a 65 business day limit on DNSPs to provide connection offers in response to connection applications.

Technical standards

The proposed rule sought the inclusion of a new schedule in Chapter 5 that sets out the automatic access standards to apply to the connection of embedded generators to a distribution network. However, the proposed rule did not specify the types of information to be provided in this schedule.

The submission from the Property Council of Australia's embedded energy technical working group (working group) contained detailed suggested changes to Schedules

18 Rule change request, p26.

19 Rule change request, p9.

20 ibid, p11.

21 Rule change request, p12.

22 ibid.

5.1a, 5.1, 5.2, 5.3, 5.3a, 5.4, 5.5, 5.6 and 5.7.[23] The group reviewed the technical requirements for the connection of generation and identified those aspects that they considered were not applicable to medium sized generators (with ratings up to and including 5 MVA).

Connection charges and shared augmentation costs

The proposed rule contained a number of items whose purpose was for DNSPs to provide information about the connection charges and costs of shared network augmentation. These included obligations on DNSPs to:[24]

- publish on their website information on connection fees, application processing fees and the basis for calculating the connection charges.
- allow embedded generator proponents to be charged a fee-for-service (additional to any connection application fee) to aid in development of the connection application.[25]
- include an itemised statement of connection costs (in so far as relevant) in the offer to connect. This would include: standard connection charges; meter type and cost; cost of network extension; details of network augmentation required; and any other incidental costs and the basis for their calculation.[26]
- only charge embedded generator proponents the cost for shallow augmentation costs (extension assets) and exempt them from paying shared network augmentation.[27]

3.1.3 Impact and assessment of the proposed rule

Connection process

The proposed rule identifies certain information that a DNSP is to publish on its website. The information includes: an application form, relevant fees, a description of the connection process, and a list of information that is to be included with a connection application. As identified by the proponents, this type of information is critical for embedded generation proponents to be able to effectively engage with DNSPs in developing an embedded generation project. Information that could practically guide connection applicants would complement the demand side engagement document and the annual distribution planning report that DNSPs are now required to publish. The additional transparency about the connection process,

23 Property Council of Australia, Consultation paper supplementary submission.

24 Rule change request, p26.

25 ibid, p17.

26 ibid, p27.

27 ibid, p28.

technical requirements and fees and charges should aid in improving the negotiation process between the parties.

In addition, to address concerns with the length of time that connection applications have taken to resolve, the proposed rule included a requirement that a DNSP's decision on whether to accept a connection application must be made within 65 business days of receipt of an application. However, specifying a set time frame to this aspect of the current connection process may not address other concerns about the overall process that have emerged in the course of this rule change process. This raises the question of what the practical impact of the proposed time limit, as applied to the current connection application process, would be. The Commission has addressed the matter of time frames in the context of adjusting the entire connection process.

Technical standards

As noted above, the proposed rule does not include any standards to apply for the connection of embedded generators to distribution networks. However, it does include a drafting note to insert a standard once it is developed. Some suggestions on amending the existing Chapter 5 schedules were included in a submission from the Property Council of Australia's embedded energy technical working group. This information, and information from other stakeholders, has indicated to the Commission the importance of technical requirements in the context of connecting embedded generators to distribution networks. However, the Commission is unable to include a drafting note in the draft rule as in the proposed rule. Instead, it would need to include the standards themselves. However, in light of the work currently undertaken by DRET, the draft rule does recognise that Australian standards may be created in the future. It also provides a framework for technical requirements to be developed and made available by DNSPs. The resulting information on the technical requirements for a distribution network should see an improved understanding of the technical aspects of connection for embedded generation proponents.

Connection charges and shared augmentation costs

The proposed rule included a number of clauses aimed at improving the information about fees and charges from DNSPs to potential connection applicants. This included requiring DNSPs to provide an itemised statement of connection costs as well as an explanation of how fees and charges may be calculated. This is consistent with other aspects of the proposed rule on the provision of information to embedded generation proponents. The impact would essentially be the same, greater information transparency will aid embedded generator proponents in negotiating with DNSPs. The result should be smoother and a more efficient connection process as well as better, more informed, decision making for embedded generator proponents.

The proposed rule included a provision specifying that DNSPs may be able to charge a fee-for-service in relation to work carried out for an embedded generator proponent. While the NER does not prevent DNSPs from charging such fees, the proponents suggested that a clarification of this in the NER would aid embedded generator

proponents in understanding the potential financial implications of pursuing an embedded generation project. The greater transparency about the entire connection process is desirable for its smooth operation.

In addition, the proposed rule specified that only shallow augmentation costs would be charged to an embedded generator. The proponents stated this was consistent with the current approach applied in Victoria. However, to implement this aspect of the proposed rule, a conflict with the general principle that where a user in the NEM creates a burden on a network then that user should contribute their share of the relevant cost would be created. To not follow this general principle would result in a cross-subsidy between users. On this basis, the Commission considers that it is appropriate that embedded generators do contribute to their share of costs arising from necessary shared network augmentation.

3.2 The draft rule

There are a number of differences between the draft rule and the proposed rule submitted to the AEMC. These differences reflect policy modifications and amendments to improve the clarity and application of the draft rule.

An important difference of note is the application of Chapter 5 of the NER to embedded generators who are not registered participants. The existing clause 5.1.2(b) is amended by the draft rule to clarify that any person who is not registered with AEMO (nor has no intention to do so) can ask an NSP to comply with Part A of Chapter 5 in seeking a connection agreement. If such a request is made then the process for connection must be followed through to its completion under Chapter 5. The amendment seeks to clarify the opt-in process that existed in Chapter 5.

These amendments will allow persons seeking to connect embedded generators to a distribution network to use the Chapter 5 process for connection. However, it ensures that non-registered embedded generators who choose to seek a connection under the Chapter 5 process are not able to switch to the Chapter 5A process mid-way through, should that be available to that person. The intent of this clarification is to provide for regulatory certainty. It is not to mandate that one connection process must be used over the other.

This will allow such persons to use the processes that exist under Chapter 5. However, it does not extend some of the other more substantive obligations surrounding generation, which currently apply to generators (that is, registered participants) to them. For example, inspection and testing arrangements under rule 5.7; commissioning of the generating facilities under rule 5.8; and disconnection and reconnection of the generating facilities under rule 5.9. The Commission considers that these aspects could be included as part of the connection agreement between the non-registered embedded generator and the DNSPs. Stakeholder comments are welcomed on this issue.

It should also be noted that the amendments to clause 5.1.2(b) could have a broader affect than just allowing a person (that is, an unregistered participant) to request a DNSP to comply with Part A of Chapter 5 when connecting an embedded generating

unit. This is because 'person' is not necessarily limited to someone wanting to connect generation (as opposed to load) and also because clause 5.1.2 applies to Network Service Providers (which also extends to TNSPs). The amendments to this clause are consistent with its existing nature, which did not seek to limit the types of 'persons' that could approach NSPs to have Chapter 5 apply to a proposed connection. However, the Commission does not expect that the potentially broader effect of these amendments will have practical ramifications for NSPs.

The policy modifications and amendments are set out in detail with supporting reasoning in Chapters 5 to 8. In summary, the key amendments in the draft rule include:

- an obligation for DNSPs to publish an 'information pack'. This would include a practical guide on making connection enquiries and applications as well as example costs;
- an obligation on DNSPs to create and publish an 'enquiry form' which would be used at the start of the enquiry process;
- an obligation for DNSPs to publish a register of plant and equipment associated with generating plant that meets its minimum access standards for connection applicable to that DNSPs network;
- clarification of the overall application of the connection process under Chapter 5, making it apply to any applicant seeking connection under these provisions, including introduction of a two-stage enquiry process, which:
  - sets out the information that must be provided by both connection applicants and DNSPs; and
  - includes the timeframes in which each aspect of the connection process must be undertaken;
- provide that the DNSPs detailed enquiry response could be an 'agreed project', and agreed projects would be subject to a fast tracked connection application process under certain conditions;
- clarification that a DNSP may charge an enquiry fee to recover the reasonable costs of the work to be carried out by the DNSP to prepare a detailed enquiry response; and
- an obligation for DNSPs to include an itemised statement of charges in the connection offer.

3.3 Civil penalties

The provisions of the NER that are classified as civil penalty provisions are listed in the National Electricity (South Australia) Regulations. The Commission may recommend

to amend or remove these provisions, but must notify the Standing Council on Energy and Resources (SCER) of the policy rationale for taking this course of action.

The draft rule amends certain provisions that are currently classified as civil penalty provisions. The civil penalty provisions which have been amended are set out in Table 3.1.

While the Commission cannot create new civil penalty provisions, it may recommend to SCER that new or existing provisions of the NER be classified as civil penalty provisions. The new provisions that the Commission is proposing to recommend to SCER as civil penalty provisions are set out in Table 3.2.

The Commission considers that the new and amended provisions should be classified as civil penalty provisions because a breach of these provisions would pose a risk to the secure operation of the NEM. In addition, the classification of these provisions as civil penalties would encourage compliance by relevant parties with these provisions.[28]

Table 3.1 Existing civil penalty provisions

Current clause reference	Draft clause reference	Proposed recommendation	Reason for recommendation
5.3.6(a)	5.3.6(a)(1)	Retain as civil penalty provisions	Restructured and renumbered with amendments: original clause split into three separate clauses to reflect both processes (existing and revised for embedded generation) for connection. Clause remains consistent with original intent.
	5.3.6(a)(2)		
	5.3.6(a)(3)		
5.3.6(b)	5.3.6(b)	Retain as a civil penalty provision	Minor amendments to reflect a continuation of the general connection process. Clause remains consistent with original intent.

28 These provisions would only become civil penalty provisions if the relevant amendments to the National Electricity (South Australia) Regulations are made and come into effect.

Table 3.2 Proposed civil penalty provisions

Draft clause reference	Proposed recommendation	Reason for recommendation
5.3A.5(f)	Classify as new civil penalty provision	Obligation on DNSPs to notify a connection applicant if an enquiry is incomplete in a material way. Equivalent to current clause 5.3.2(b) which is currently listed as a civil penalty provision.
5.3A.7(a)(1)	Classify as new civil penalty provision	Requires the preliminary response from the DNSP to include all items listed in Schedule 5.4. Equivalent current clauses 5.3.3(c)(1), 5.3.3(c)(2) and 5.3.3(c)(3) are designated as civil penalty provisions. The draft rule divides clause 5.3A.6(c) into those paragraphs that attract a civil penalty and those that do not.
5.3A.8(b)	Classify as new civil penalty provision	Obligation on DNSPs to notify a connection applicant if an enquiry for a detailed response is incomplete in a material way. There are no counterparts in the NER for this clause, but the nature of the obligation is the same as clause 5.3A.5(e) (see above), which is recommended for listing as a civil penalty provision .
5.3A.8(f)(1)	Classify as new civil penalty provision	The detailed response from the DNSP is to include all items listed in Schedule 5.4. Equivalent to clauses to 5.3.3(c)(4), 5.3.3(c)(5) and 5.3.3(c)(6) which are listed as civil penalty provisions.
5.3A.10(e)	Classify as new civil penalty provision	Equivalent to current clause 5.3.5(g), which is currently a civil penalty provision.

4 Commission's assessment approach

The Commission's assessment of the rule change request is subject to an assessment framework based on the national electricity objective (NEO) in addition to a number of other related factors. These other factors include a set of principles and issues arising from work being conducted under other relevant rule changes and reviews (including any reviews external to the AEMC).

In preparing this draft rule determination, the Commission has taken into account the assessment framework outlined in this chapter.

4.1 National electricity objective

The Commission must consider whether the proposed rule promotes the NEO as set out under s. 7 of the National Electricity Law (NEL) (see section 2.4 of this draft determination).

In assessing the rule change request against the NEO, the Commission's considerations have included whether the proposed changes would lead to:

- lower costs for embedded generators and distributors;
- more efficient investment outcomes including providing clearer, more cost-reflective price signals;
- clearer, more transparent and timely connection processes for connections to distribution networks; and
- clearer, more transparent processes and information about determining connection costs.

4.2 Principles for assessing the rule change request

To assess the rule change request against the NEO the Commission has established a set of principles that have been applied:

- **transparency** - project proponents or connection applicants and DNSPs should have sufficient information available to them to allow efficient and safe decisions to be made;
- **proportionality** - any costs arising from the regulatory requirements must be proportionate to the benefits;
- **technology neutrality** - the framework for connections should be technology neutral and not biased towards one class of participant or stakeholder;

- **consistency across the NEM** - the framework for connections should be consistent across all regions and all types of participants and stakeholders where this is appropriate;

- **fit for purpose and reflecting local requirements** - while consistency is an important principle, where it is necessary, allowances should be made for differences in participant requirements, operating requirements and network conditions; and

- **economic efficiency** - the framework for connections should promote efficient investment in, and operation of, distribution networks and generation systems.

4.3 Other relevant rule changes and reviews

The Commission has also taken into account considerations under other rule changes and reviews that relate to the issues considered in this assessment of the rule change proposal.[29] These include:

- AEMC's distribution network planning and expansion rule change, where changes were made to the NER to require DNSPs to publish information about network limitations in their annual planning reports and process information in the demand side engagement document;

- AEMC's transmission frameworks review (TFR) where the AEMC has considered arrangements for connecting to the transmission network including the cost allocation framework;

- AEMC's power of choice review where the AEMC has considered arrangements for encouraging flexible pricing options and demand side participation through increasing consumer participation in energy markets.

- DRET's review of technical standards for connecting to distribution networks.

29 These considerations are further outlined in Chapter 2.

5 Connection process

This chapter sets out a description of the connection process under the draft rule including the connection enquiry and connection application stages. It also provides an explanation of the factors that were taken into consideration. This connection process is aimed at improving transparency and the availability of information for connection applicants as well as providing clearer timeframes for completing actions.

The remainder of this chapter sets out in detail the individual components of the draft rule. The draft rule addresses the issues raised by the proponents and other stakeholders about the availability of information for connection applicants and the efficient and timely progress of connection enquiries and applications. The key issues on the connection process are:

- connection applicants having sufficient information to allow them to participate effectively in the connection enquiry and application processes;
- DNSPs receiving sufficient information to assess the requirements for connection;
- connection enquiries and applications being completed in a timely manner;
- where appropriate, promoting consistency of requirements across DNSPs; and
- improving certainty of outcomes for both connection applicants and DNSPs.

5.1 Overview of draft rule

The Commission's draft rule amends the connection enquiry and application process under Chapter 5 of the NER in relation to embedded generators seeking connection to the distribution network (modifications to existing connections). The draft rule requires DNSPs to publish an 'information pack' to assist embedded generators in undertaking connection enquiries and applications. The information pack would also provide high level information, such as examples of charges, to assist embedded generators with developing their projects prior to formally lodging an enquiry.

The draft rule provides a two-stage enquiry process for embedded generators where a preliminary enquiry stage would be followed by a detailed enquiry stage. A 'fast tracked' connection application stage is also included. The features of the connection process under the draft rule are discussed throughout this chapter and depicted in the flowchart in Appendix A. A summary of the key features of the connection provisions under the draft rule, in comparison with the current provisions and the rule change request, is set out in the following table.

Table 5.1 Connection process under the draft rule - comparison with existing provisions and the rule change request

Current NER provisions	Rule change request	Draft rule
Information (see sections 5.2.1 and 5.2.4)		
DNSPs are required to publish the demand side engagement document and the distribution annual planning report (DAPR), which includes information on network constraints.	Network service providers publish additional information including applicable fees for connection; description of how an application for a connection is made; description of the connection process and the information to be submitted; and the basis for calculating fees.	DNSPs (not NSPs) would be required to publish an 'information pack'. The information pack would include a practical guide on making connection enquiries and applications and example costs. It would complement the demand side engagement document which already includes details about the connection process and basis for calculating charges.
Schedule 5.6 sets out the minimum terms and conditions that are to be agreed to in connection agreements and to be set out in the connection offer. Principles relating to connection under Chapter 5 include that the terms and conditions for connection are to be set out in commercial terms between network service providers and registered participants.	Clarify that the terms and conditions set out in Schedule 5.6 also apply to connection agreements between NSPs and embedded generators.	The information pack would include a model connection agreement to provide an example of the final connection agreement that applicants would need to enter into. Clarification of the connection process under Chapter 5 on whether provisions would apply to any applicant seeking connection.
The offer to connect must define the basis for determining any distribution and transmission service charges (and other details).	The offer to connect made by NSPs is to include an itemised statement of connection costs.	DNSPs would include an itemised statement of charges in the connection offer.
Connection enquiry process (see sections 5.2.2 and 5.2.3)		
Initiating an enquiry - Schedule 5.4 sets out the information to be included in a preliminary enquiry.	Proposed that NSPs publish an 'application form'.	DNSPs would be required to publish an 'enquiry form' to be used at the start of the enquiry process. The enquiry form would initiate the 'preliminary enquiry'. (No requirement for a connection application form to be published.)
Within 10 business days, DNSPs provide 'preliminary' details that are relevant to an application such as those of	No proposed change.	Information to be included in the preliminary enquiry response as outlined below in section 5.3.2.

Current NER provisions	Rule change request	Draft rule
any other parties that are to be involved in the planning of the connection and who must be paid for transmission or distribution services.		
Within 20 business days, DNSPs provide technical requirements and information required to lodge a connection application.	No proposed change.	Within 15 business days, DNSPs provide technical requirements; information on undertaking connection enquiries; relevant example costs; relevant information on network constraints for the enquiry lodged; and information required to be submitted for a 'detailed enquiry response' to be provided and any relevant enquiry fee. This would be the DNSPs' 'preliminary enquiry response' and completes the preliminary enquiry stage of the process.
The current enquiry process is a single-stage process.	No proposed change.	The applicant may then proceed with a detailed enquiry and submit the information requested by the DNSP and, if applicable, the enquiry fee to the DNSP. If a request for a detailed enquiry response was lodged after three months, the DNSP could request the applicant to submit a new enquiry. The DNSP would confirm that the request for a detailed enquiry response had been received and whether all the requested information had been provided. This stage would be expected to be an iterative stage where the DNSP and applicant communicate as required on the progress of the enquiry. For proposed connections that would not require shared network augmentation, the DNSP would need to provide the detailed enquiry response within 30 business days. Otherwise the applicant and DNSP would agree a timetable for providing a

Current NER provisions	Rule change request	Draft rule
		response but within a maximum of four months.
There is no 'agreed project' provision.	No proposed change.	The DNSP's detailed enquiry response would form the 'agreed project'. Agreed projects would be subject to a fast tracked connection application process.
Connection application process (see section 5.2.4)		
An application to connect may be lodged following the completion of the enquiry process. There are no provisions about the timeframe within which applications need to be lodged.	No proposed change.	The applicant would then decide whether to proceed with the agreed project or make changes to its requirements. If the connection application is lodged after six weeks, the DNSP could request the applicant to lodge a new connection enquiry.
Following the lodgement of a connection application, the DNSP makes the connection offer within the time as set out in its program.	Proposed that NSPs make all connection offers within 65 business days.	Where the applicant lodges a connection application for the agreed project, the DNSP would make an offer to connect within 20 business days. Alternatively, where the connection application varies from the agreed project, the applicant and the DNSP would agree a timeframe for the DNSP to provide a connection offer. The applicant would be required to explain the differences and the DNSP could request that a new connection enquiry be lodged.
There are no time limits within which the connection offer is to be accepted.	No proposed change.	Once the DNSP has made a connection offer, the applicant would have 20 business days to accept the offer. The DNSP and the applicant could agree to extend this timeframe.

5.2 Commission's assessment

Detailed analysis of each aspect of the connection process is set out in this section, including discussions of issues raised by the proponents and stakeholders. The Commission's analysis and conclusions on these issues is also included.

5.2.1 Availability of upfront information

Current provisions

Currently under the NER, DNSPs are required to develop and publish a demand side engagement document which is to include information about how DNSPs engage with non-network provisions (for example, embedded generators) and the process for lodging connection applications.[30] DNSPs are also required to publish annual reports of their planning activities, termed the DAPR. The DAPR includes forecast information on demand and network limitations (or 'constraints').[31] The NER also sets out the minimum terms and conditions that apply to connection agreements.[32]

A number of DNSPs also publish 'connection guidelines'.[33]

Proponents' views

To assist connection applicants, the proponents proposed that NSPs be required to publish information including: a description of how an application for a new connection is to be made; a description of the connection process; identification of the information that must be submitted with an application to connect; and the basis for the calculation of connection charges.[34] The proponents also noted there was a rule change that required DNSPs to publish an annual planning report, which would include information on network constraints.[35] In regard to upfront information on network constraints, the proponents considered the annual planning report would provide sufficient information. The proposed rule outlined specific items to be published by DNSPs upfront including a description of how connection applications are to be made.

Stakeholders' views

Stakeholders generally agreed that upfront information for connection applicants would assist with their understanding of connection requirements and allow enquiries and applications to progress more effectively. For example, the Northern Alliance for Greenhouse Action submitted that the connection process would "be improved and facilitated with increased information and transparency on local grid capacity, response periods for connection applications and costs for fees and connections".[36] It

30 Schedule 5.9 of the NER.

31 Rule 5.13 of the NER.

32 Schedule 5.6 of the NER.

33 Some of these guidelines are published under specific jurisdictional provisions such as under the NSW accredited service provider requirements.

34 Rule change request, p26.

35 The rule change proposal states that if the requirement for DNSPs to publish capacity constraints in their annual report were adopted, it would be sufficient to meet the objectives of this rule change proposal. Rule change request, p18.

36 Northern Alliance for Greenhouse Action, Consultation paper submission, p1.

noted that the connection requirements can be difficult to understand and considered there was a lack of transparency of the factors that DNSPs took into consideration when progressing enquiries and applications. For example, Arup submitted that it has found the connection process to be "variable and evolving" and the Clean Energy Council submitted that "a lack of clarity in Chapter 5 has led to many DNSPs applying a connection process consisting of parts of Chapter 5 and other in-house processes".[37]

Some stakeholders noted that there were already requirements for DNSPs to publish information relating to connection requirements under the demand side engagement document and also that some DNSPs already published 'connection guidelines'.[38] Stakeholders noted that the information published under requirements in Chapter 5A of the NER could also assist Chapter 5 connection applicants.[39]

Conclusions

The Commission considers there is value in providing upfront information to applicants to provide them with the opportunity to develop an understanding of the connection requirements and be able to more effectively participate in the connection process. Such information could improve the transparency of the connection requirements and assist all parties with reducing the overall complexity of putting the NER requirements into practice. Accordingly, the draft rule requires that DNSPs publish information that:

- provides a practical guide that steps through the process of how to lodge connection enquiries and applications;
- outlines what an applicant can expect to happen at each stage of the connection process;
- outlines examples of possible charges that would be incurred for connection; and
- provides a model connection agreement.

Although DNSPs are required to publish a demand side engagement document, the Commission considers that the current provisions require DNSPs to describe the process itself rather than provide specific guidance to applicants on how to follow and apply the connection requirements. For this reason, the draft rule includes requirements to publish information that can more actively guide applicants through the whole connection process. Such information would complement the demand side engagement document and other existing provisions (such as the distribution annual planning report).

37 Arup, Consultation paper submission, p1; Clean Energy Council, Consultation paper submission, p3.

38 DMITRE, Consultation paper submission, p4; ENA, Consultation paper submission, p1.

39 Consultation paper submissions from: United Energy, p1; SP AusNet, pp 1-2; and Energex, p3.

The draft rule also introduces the requirement for DNSPs to provide detailed examples of potential costs. DNSPs would be required to publish examples of relevant charges or ranges of charges based on the type of technology being connected and the location of connection. This information would not be binding on DNSPs but is expected to provide a useful guide to applicants to assist them with understanding the potential types and magnitudes of charges that may be incurred.

DNSPs would also be required to publish a model connection agreement to assist applicants with understanding the relevant commercial factors that would need to be considered throughout the connection process. The Commission notes stakeholders' concerns regarding a lack of transparency on the terms and conditions of connection, and that there can be a limited amount of time for applicants to review the final connection agreement. Although the NER currently sets out the terms and conditions of a connection agreement, publishing a standardised document would assist applicants with understanding those terms and conditions in the context of a connection agreement.[40] This could contribute to improving the efficiency of the negotiation process for both applicants and DNSPs.

The Commission considers that DNSPs should have some flexibility in implementing these information requirements to take into account any specific business or regional requirements. DNSPs could either include the information together with the demand side engagement document or publish the information separately. However, the Commission expects that DNSPs would publish all related information in a centralised manner so that it is easily accessible. Together with the technical information requirements discussed in Chapter 6, the DNSPs would develop an 'information pack' which captures all relevant information for connection enquiries and applications.

In considering the potential costs and benefits of implementing the draft rule, the Commission acknowledges that DNSPs would incur some costs to prepare and publish the additional information. These costs may vary between DNSPs. As DNSPs are already required to produce the demand side engagement document, and many DNSPs already publish some form of connection guideline, the additional costs should not be material. By clarifying the connection process and requirements, DNSPs can also benefit by ensuring there is a clearly documented process to be applied. This would assist DNSPs to address connection enquiries and applications in an efficient manner. The availability of the additional information would contribute to improving the confidence of connection applicants and assist with investment decision making and planning. Overall, there would be an increase in the transparency of the connection process which could lead to greater consistency between DNSPs and improved efficiency in completing connections to distribution networks.

40 Schedule 5.6 of the NER sets out the terms and conditions of connection agreements.

5.2.2 Initiating a connection enquiry: the preliminary enquiry stage

Current provisions

The NER currently outlines a single stage connection enquiry process where DNSPs are required to provide a response to an enquiry within 20 business days. Schedule 5.4 sets out the information that is to be provided with a preliminary enquiry.[41]

Proponents' views

The proponents considered the connection process could be burdensome, time-consuming and costly for small generators.[42] It was also suggested that some DNSPs have not always promptly responded to connection enquiries. In this regard, the current 'propose and respond' process does not provide satisfactory outcomes for connection applicants.[43] Despite these concerns, the proposed rule did not include any amendment to the connection enquiry process.

Stakeholders' views

Submissions from embedded generator stakeholders agreed with a number of the issues raised by the proponents.[44]Many of these stakeholders considered that the time taken to complete connection enquiries was too long, there was a lack of clarity on whether enquiries had been received, and there could be a lack of response from DNSPs. For example, the Energy Efficiency Council (EEC) submitted that its members had noted "many instances where DNSPs have provided unclear and unreasonable responses to connection enquiries".[45] Through informal discussions with a number of stakeholders and at the workshop, the Commission understands that many stakeholders currently were more likely to follow an 'informal' process to initiate an enquiry such as by phoning a DNSP to discuss preliminary details about a potential connection prior to lodging a connection enquiry.

In contrast, DNSPs noted that at times connection enquiries have been incomplete and unclear. In some cases, it has been difficult for the relevant DNSP to ascertain the project requirements and therefore how best to respond. United Energy submitted that there have been cases where the applicant did not have sufficient knowledge of the technical aspects of its application.[46]

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41 Clause 5.3.2 of the NER.

42 Rule change request, p9.

43 ibid, p11.

44 Consultation paper submissions from: Energy Efficiency Council, p1; Australand, pp 1-2; Honeywell, p1; Clean Energy Council, p1; ISPT Super Property, p2; TEC Environment Centre, p3; and others as summarised in Appendix C.

45 EEC, Consultation paper submission, p6.

46 United Energy, Consultation paper submission, p3.

Some stakeholders acknowledged that in practice the enquiry process was an iterative process and could reasonably take some time depending on the nature of the project.[47] Stakeholders also agreed that many communications have been taking place prior to connection enquiries being lodged despite there being no clear basis to guide these interactions.[48] Both connection applicants and DNSPs expressed dissatisfaction with the progress of the enquiry process. This raised questions regarding the overall effectiveness and purpose of the current connection process. Stakeholders also agreed that many communications have been taking place prior to connection enquiries being lodged despite there being no clear basis to guide these interactions. This raised questions regarding the overall effectiveness and purpose of the current connection process.

Conclusions

The proposed rule did not address the issue of preliminary negotiations between parties. However, the Commission has taken into consideration the issues raised by stakeholders regarding initiating a connection enquiry. That is, in practice, some level of preliminary preparation is required by both the applicant and DNSP prior to an enquiry being formally lodged. The Commission understands that this preliminary work is required to ensure that the applicant provides the correct information and that DNSPs can manage and plan their response so that the most appropriate and relevant information is provided to the applicant. In some cases connection applicants may be considering a number of options and some preliminary discussions and exchange of information are required prior to proceeding with a specific project.

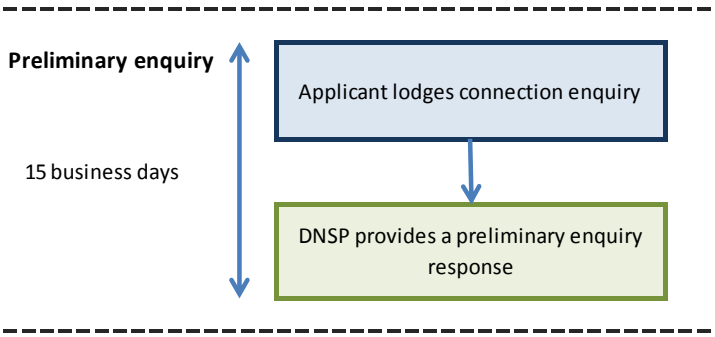
For these reasons, the Commission considers there is merit in acknowledging this initial step in the enquiry process in the NER. The preliminary enquiry stage under the draft rule provides clear timeframes for responses to be provided and that the requirements for both the applicant and DNSP are clear. The draft rule therefore sets out a two-stage enquiry process with the first stage being the 'preliminary enquiry stage' followed by the 'detailed enquiry stage'.

In considering the potential costs and benefits of the draft rule, the Commission notes DNSPs may incur operating costs in implementing the new stage in the enquiry process. However, this preliminary enquiry stage is expected to provide greater clarity than the existing ad hoc processes and arrangements. By providing a clearer framework for initiating connection enquiries, it is likely that the benefits for both DNSPs and applicants would outweigh any costs.

47 For example, Arup, Consultation paper submission, p3; and Grid Australia, p3; in addition to a number of DNSPs, Energex (p9); United Energy (p7); and CitiPower & Powercor (p5).

48 For example, in its consultation paper submission, the EEC submitted that the connection processes were "typically ad hoc" (p1).

Figure 5.1 The preliminary enquiry stage



Purpose of the preliminary enquiry stage

The purpose of the preliminary enquiry stage is to provide structure to this initial part of the connection process. This first stage of the enquiry process would provide general, higher level information and any project specific information that may help the connection applicant understand its connection options. The preliminary enquiry stage would provide improved certainty to both the applicant and DNSP and improve the overall transparency of the connection process. Consistency of process between DNSPs would also be promoted.

Initiating the preliminary enquiry

The NER currently sets out the information that should be included in an enquiry. The draft rule builds upon this by requiring a form to be produced and adding the requirement for applicants to set out a qualitative description of their project objectives and any specific information the applicants request the DNSP to provide.

DNSPs would be required to publish an enquiry form, which would be submitted by the applicant to initiate the enquiry process. The submission of the enquiry form would provide a clear point of initiation for the preliminary enquiry stage and govern specific times for DNSPs to acknowledge the receipt of the enquiry and provide a preliminary response. The enquiry form would request a qualitative description of the applicant's requirements, and provide a means to promote communications between the applicant and DNSP and for expectations to be appropriately managed.

The enquiry form would request information from the applicant that would be necessary for the DNSP to understand the applicant's overall objectives of initiating an enquiry as well as specific details of the option or options that are being considered. The qualitative information would provide the opportunity for the applicant to outline any information that may not otherwise be captured (for example, if the applicant is considering a number of similar projects or the applicant is open to changing its proposed plant). Such information at the beginning of the enquiry process could assist both the applicant and DNSP in efficiently identifying relevant issues for analysis and further discussion.

Content of the preliminary enquiry response

The DNSP would provide a 'preliminary enquiry response', which would set out relevant information that would guide the applicant in the remainder of the connection process. Many of the components of the preliminary enquiry response could be standardised by DNSPs with certain relevant information updated for each specific enquiry. The information in the preliminary response as specified in draft schedule 5.4A and would include:

- details of other parties that need to be involved in the planning to make the connection (this is a requirement under the existing enquiry process);
- applicable technical standards (this is a requirement under the existing enquiry process);
- whether negotiated access standards would likely be required and what aspects of the access standard would be relevant for negotiation;
- example charges that may be relevant to the connection enquiry (this information may be an extract of the published information with any updates specific to the enquiry where applicable);
- information on the network constraints that may apply in the area for which connection is sought (this information may be an extract of the information published in the DAPR with any updates specific to the enquiry where applicable); and any likely need for shared network augmentation;[49]
- a copy of the model connection agreement with relevant sections that would likely need to be clarified for the proposed connection identified; and
- details of the connection process including a weblink to the information pack and explanations of the next steps in the connection enquiry and application process (this would include the DNSP's account manager's contact detail and an explanation of the validity period).

On receipt of the preliminary enquiry response, the next step would be for the applicant to consider the information and decide whether to progress the enquiry by lodging a request for a detailed enquiry response.

Relevant timeframes

The preliminary enquiry stage would be governed by a number of timeframes:

- the DNSP acknowledges the receipt of the enquiry within two business days;
- the DNSP provides the preliminary enquiry response within 15 business days; and

49 The definition of 'shared network' is discussed in Chapter 7.

- the preliminary enquiry response would remain valid for three months (after this time the DNSP could request the applicant to submit a new connection enquiry).

Taking into consideration existing timeframes under the NER and issues raised in submissions, the Commission considers that 15 business days is a reasonable timeframe to allow the information to be compiled and provided. The requirement for a DNSP to acknowledge receipt of the enquiry provides certainty to all parties and confirms the timeframe in which a response would be provided.

As project and network requirements can change, it is not expected that the information provided by a DNSP in the preliminary enquiry response would remain valid after a long period of time. For this reason, the draft rule provides that a preliminary enquiry response would remain valid for three months. Should the applicant wish to progress to a detailed enquiry response after this time, the DNSP could request a new enquiry be lodged. Where there have not been any changes in network requirements, the DNSP may choose to proceed with the existing enquiry even if three months has expired.

5.2.3 Undertaking a more detailed connection enquiry: detailed enquiry stage

Current provisions

As noted above, the current NER provisions provide a single-stage enquiry process. A DNSP's response to a connection enquiry is to include relevant technical details and the information that must be submitted for a connection application.[50]

Proponents' and stakeholder views

The proponents' and stakeholders' views on the connection enquiry process are discussed above in section 5.2.2. The key points are that the enquiry process takes too long to be completed and the requirements on applicants and DNSPs are not clear. Additionally, Essential Energy proposed an 'agreed project' concept which could be applied to allow some projects to be progressed more quickly through the connection application process.[51] Essential Energy proposed that the enquiry process could lead to an "agreed project" which both the proponent and DNSP consider would meet the generation objectives and network performance needs.[52] This agreed project would then become the subject of the formal connection process under Chapter 5 of the NER.[53]

50 Clause 5.3.3 of the NER.

51 Essential Energy, Consultation paper submission, p3.

52 ibid.

53 ibid.

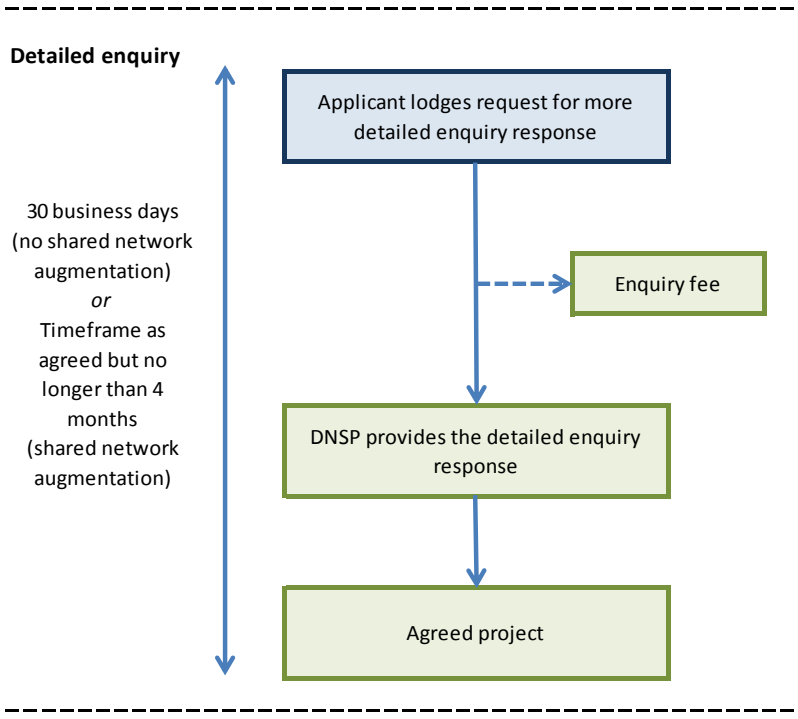
Conclusions

The technical requirements for embedded generation connections to a distribution network could vary significantly from one connection to another. This is due to the variation and range of available technologies, as well as due to the nature of distribution networks which could lead to issues specific to the location at which a connection is sought. Time and coordination between applicants and DNSPs is required to investigate the potential connection requirements and alternatives. In addition, the parties seeking connection of embedded generating units can also be diverse with varying levels of knowledge and expertise in the electricity market. This variance in resources and expertise should also be acknowledged.

The two-stage enquiry process provides a clear framework for the necessary investigations and discussions to take place. Following the receipt of the preliminary response, applicants would have more information to allow them to assess their business case and determine the appropriate next steps. The subsequent detailed enquiry stage would then consider more specific network analysis that would be required to carry out a connection.

The detailed enquiry process largely reflects the current enquiry process with the addition of specific timeframes and providing clarity on the obligations of applicants and DNSPs. For this reason, the costs of implementing the draft rule are not expected to outweigh the benefits in providing greater certainty and transparency to the enquiry process.

Figure 5.2 The detailed enquiry stage



Purpose of the detailed enquiry stage

The purpose of the detailed enquiry stage is to allow applicants with specific project proposals to obtain sufficiently detailed information about all aspects of the connections they are seeking. This includes understanding of the technical requirements for connection and the range and magnitude of potential charges. The detailed enquiry response would build upon the preliminary enquiry response and provide more in-depth analysis.

It is expected that the detailed enquiry stage would result in clarification of the project parameters and network requirements. Consequently, at the end of the enquiry stage, parties would be clear about the form and content of any negotiated access standards that would be applied. Discussions of potential costs would also have taken place so that the applicant would be clear on each of the components of charges that would be incurred for connection.

The purpose of the detailed enquiry stage is also to allow sufficient analysis and exchange of information to take place such that the final stage of the connection application can be completed more quickly (through the agreed project provisions as discussed below).

Detailed enquiry process

As outlined above, the content of the preliminary enquiry response will set out the information that the applicant is to provide to the DNSP when it lodges a request for a detailed enquiry response. The request for the detailed enquiry response may also require the applicant to pay an enquiry fee (see Chapter 7).

Content of the detailed enquiry response

The detailed enquiry response would build upon the information provided in the preliminary enquiry response, providing more in-depth analysis and considerations. The detailed enquiry response (see draft schedule 5.4B) would include:

- the DNSP's description of the project being considered including the point of connection and the facilities;
- the access standards as discussed and negotiated with the applicant throughout the process to date;
- an explanation of all components of the charges that would be incurred for connection and estimates of what the charges will be. This would include an explanation of what factors, if any, will affect the charges and what other information would be required during the connection application stage to finalise these charges (including what information would be required from the applicant);
- the proposed draft connection agreement with any areas outstanding for discussion clearly identified with explanations of what further considerations

would be required (including what information would be required from the applicant);

- any other information the applicant needs to provide to make a connection application; and
- an explanation of the remainder of the process including requirements for submitting the application to the DNSP, any applicable connection fee, an explanation of the activities that would be undertaken by the DNSP, and the validity period.[54]

A project or detailed enquiry response could be subject to, or dependent upon, meeting other legislative requirements such as a local planning or environmental requirements. Should this be the case, the detailed enquiry response would need to specifically outline these dependencies and how they may impact the project, and the connection enquiry and application process.

Agreed project

The draft rule provides that the project and connection requirements as outlined in a DNSP's final detailed enquiry response would constitute the 'agreed project'. The agreed project concept takes into consideration that a reasonable amount of analysis and discussions between the parties would take place under the detailed enquiry stage. Should the applicant wish to proceed and obtain a connection offer based on the same project parameters and requirements, the connection application process could be completed more quickly. Therefore, the draft rule provides that agreed projects may be 'fast tracked' under the connection application process within 20 business days (as further discussed in section 4.3.4).

The inclusion of the agreed project option in the draft rule would provide an incentive for DNSPs to be clear on the project requirements and thorough in their analysis during the detailed enquiry stage. It would also provide an incentive to applicants to provide all relevant project information during the detailed enquiry stage.

Relevant timeframes

The detailed enquiry stage would be governed by a number of timeframes. This includes the following requirements:

- the DNSP to acknowledge the receipt of the request for a detailed enquiry response within two business days;
- the DNSP reviews the application and clarifies whether it is complete or any information has not been included within ten business days;

54 The NER currently provides the ability for DNSPs to charge an application fee. The application fee applies for the connection application process whereas the enquiry fee, mentioned above and discussed in detail in Chapter 7, applies to the enquiry process.

- the DNSP provides the detailed enquiry response within 30 business days for projects that do not require shared network augmentation; or for projects that are likely to require shared network augmentation, the DNSP provides the detailed enquiry response within the time agreed with the applicant but, in any case, within four months; and

- the detailed enquiry response remains valid for six weeks.

As for the preliminary enquiry process, the Commission has taken into consideration existing timeframes under the NER and issues raised in submissions. The Commission considers that a maximum of 30 business days is a reasonable timeframe to allow a detailed enquiry response to be completed in cases where there is no shared network augmentation required. As projects can vary in complexity, it is expected that a detailed enquiry for less complex projects would be completed within a shorter timeframe than the maximum 30 business days.

Where shared network augmentation is required, it would be reasonable to allow more time for the relevant network analysis to be completed. For this reason, the draft rule provides for the applicant and DNSP to agree an alternate timeframe to complete these responses within a maximum of four months. Setting a suitable alternative timeframe would improve the ability for all parties to plan and manage the enquiry requirements. It should result in improved certainty of completing enquiries within the specified period.

It is not expected that the detailed enquiry response provided by DNSPs would remain valid for a long period of time for the same reasons as outlined in reference to the preliminary enquiry response. Whether projects will go ahead impacts the DNSPs, current users of the network and other applicants wishing to connect to a specific location. For this reason, limiting the time that detailed enquiry responses are valid would improve the certainty for all parties involved in the connection process and using the network. The draft rule provides a six week timeframe for an applicant to proceed in obtaining a connection offer. After this time, the DNSP could require a new enquiry to be lodged. In the case where there may not have been any changes in network requirements, the DNSP may choose to proceed with the existing enquiry.

5.2.4 The connection application process

Current provisions

The current provisions under the NER for connection applications require applicants to submit applications to connect that include the information the DNSP requested in the enquiry response. Where applicable, the connection applicant is responsible for providing a proposed negotiated access standard with its application. Where the application includes a negotiated access standard that the DNSP has accepted, the DNSP must make a connection offer that is fair and reasonable.[55]

55 Clauses 5.3.5(a), 5.3.6(a), 5.3.6(c).

Proponents' views

The proponents commented that there were no binding timeframes under the current connection application process. In their view, this has led to situations where there has been a misalignment between the project proponent's requirements and a DNSP's connection process.[56] For this reason, there have been significant additional costs to project proponents.[57] The proponents proposed that a 65 business day limit be placed on NSPs to provide connection offers in response to connection applications. In addition, the connection offer should provide an itemised list of connection charges (see section 7.4.3 for further discussion on this point).

Stakeholders' views

Project proponent stakeholders generally agreed with the issues raised by the proponents. Some of these stakeholders stated that the lack of specific timeframes under the connection application process had resulted in uncertainty for projects and significantly long times for connection offers to be made. For example, the City of Sydney submitted that the application of the Chapter 5 requirements can be burdensome, time-consuming and costly.[58] These stakeholders also agreed that an itemised statement of charges would be necessary as a part of the connection offer.

However, DNSPs considered that the proposed 65 business day timeframe did not take into account the varying complexities of connection applications. They noted that due to the natural evolution of distribution networks, it was generally necessary to undertake a case-by-case assessment of connection applications to ensure that relevant issues are analysed and resolved.[59] However, other stakeholders submitted that there should be greater standardisation. For example the Clean Energy Council considered that the current practices applied to embedded generator connections are losing context given the growing interest in commercial scale embedded generation. As such, the connections can no longer be considered a practice to be undertaken in a bespoke fashion.[60]

Most DNSPs did not oppose the proposed requirement for them to provide an itemised statement of connection charges.[61] However, the ENA noted that there were reservations with the use of "standard" charges terminology in relation to connections as connection requirements can vary.[62]

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56 Rule change request, p12.

57 ibid.

58 The City of Sydney, Consultation paper submission, p1.

59 For example, ENA, Consultation paper submission, p20; Jemena, Consultation paper submission, p7; and CitiPower and Powercor, Consultation paper submission, p6.

60 Clean Energy Council, Consultation paper submission, p2.

61 For example, CitiPower & Powercor, Consultation paper submission, p5; United Energy, Consultation paper submission, pp 1, 7; Jemena, Consultation paper submission, p5.

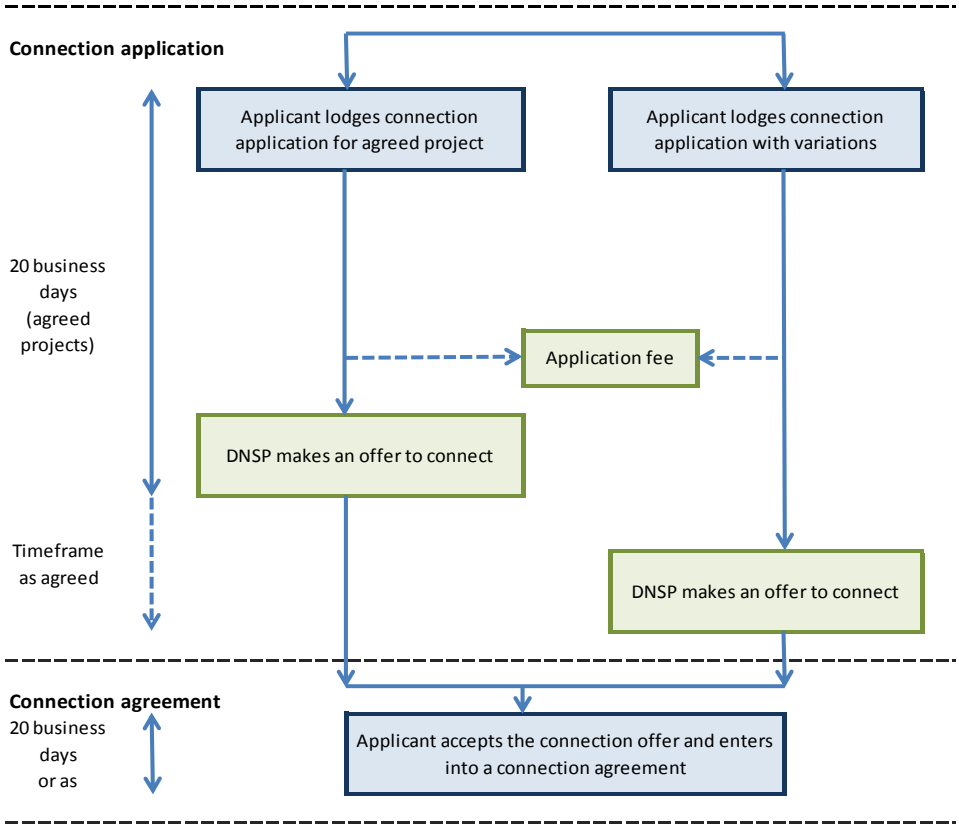
62 ENA, Consultation paper submission, p15.

Conclusions

The Commission acknowledges that project requirements may vary quite significantly and that in most cases some level of case-by-case assessment must be undertaken. At the same time, there may be less complex projects where the connection enquiry and application process should be able to be completed within a shorter timeframe. The draft rule for the connection application process provides a 'fast track' option for projects that have undergone a detailed enquiry.

The Commission understands DNSPs could incur operational costs to implement the changes to the connection application process. However, the potential costs are not expected to be material as the changes to the application process are incremental. The draft rule would be likely to improve the clarity of the requirements and obligations for both DNSPs and connection applicants, which would promote certainty for all parties. The transparency and operational efficiency of the connection arrangements would also be promoted. For these reasons, the potential benefits are expected to outweigh the potential costs.

Figure 5.3 The connection application stage



Purpose of the connection application

Building on the two-stage enquiry process, the purpose of the connection application is for the DNSP to respond to the applicant with a connection offer. The application process provides the opportunity for charges to be confirmed. As the relevant charges

should form an important aspect of the analysis and discussions throughout the enquiry and application process, the draft rule requires that the connection offer outlines all the relevant charges for connection.

The connection application process also allows the details of the connection agreement discussed and progressed. Given the detailed enquiry phase would have been completed prior to a connection application being lodged, it would be expected that few technical issues would be left to be resolved at this stage.

Should the applicant decide to vary its application from the agreed project, the connection application stage also provides time for any additional analysis to be undertaken to examine the impact of project variations.

Application process

As outlined above, the response from the DNSP in the detailed enquiry stage would constitute the agreed project. The draft rule also requires the DNSP's response to include details of what the applicant needs to submit for a connection application. Consistent with the existing requirements for the connection application process, the DNSP may charge a connection application fee.

The applicant would then have one of two options:

1. to proceed with the agreed project without any variation, it would submit the requested information to the DNSP along with any connection application fee. For agreed projects, the DNSP would then need to make the connection offer within 20 business days; or

2. should the applicant decide that some aspects of its project need to be varied, the applicant may make the variation and submit a connection application. The applicant would be required to explain what variations it has made and how the changes affect the access standards agreed during the connection enquiry process (and where applicable, propose new access standards for negotiation). Depending on the nature of the variations, the DNSP may request the applicant to resubmit a connection enquiry. In doing so, the DNSP would be required to clearly explain its reasons for such a request. Otherwise, the DNSP would agree a timeframe with the applicant within which the connection offer would be made. Under the draft rule, this timeframe is not to exceed four months.

Offer to connect

The NER currently sets out provisions for connection offers. These provisions include that the offer must be fair and reasonable, and consistent with the safe and reliable operation of the power system. In addition to these existing provisions, the draft rule requires connection offers made by DNSPs to include:

- an itemised list of all applicable charges to be paid by the applicant to complete the connection;

- a draft of the connection agreement;
- an explanation of the processes and actions required by the applicant to accept the connection offer and finalise the connection agreement; and
- an explanation of the validity period of the connection offer including the applicant's options if it does not accept the connection offer within the valid period.

The current provisions under the NER also provide that once a connection application, and any applicable negotiated access standards, has been accepted by the DNSP, the DNSP must make an offer to connect.[63]The offer to connect must also be fair and reasonable and a DNSP must use its reasonable endeavours to provide an offer in accordance with the reasonable requirements of the applicant.[64] These provisions are retained and have not been modified by the draft rule.

Relevant timeframes

The connection application process would be governed by a number of timeframes. This includes the following requirements:

- that the DNSP acknowledges receipt of the connection application within two business days;
- the DNSP makes a connection offer for agreed projects within 20 business days (from the receipt of a complete application to connect);
- the DNSP makes the connection offer for other projects within a time agreed with the applicant but within four months;
- the connection offer would be valid for acceptance for 20 business days (unless otherwise agreed between the parties).

Given the analysis that would have been undertaken during the detailed enquiry stage, the draft rule provides a further 20 business days for the connection offer to be finalised. DNSPs would also be required to confirm the receipt of applications to assist with the parties understanding of the relevant timeframes that apply.

Consistent with existing provisions under the NER, where it is relevant DNSPs will be required to consult with transmission network service providers (TNSPs) and AEMO during the connection process. The time awaiting responses from these parties will not be included in the 20 business timeframe.

Similar to the enquiry process, it is not expected that the connection offer would remain open indefinitely given that project and network conditions can change. Also, as discussed, whether a project goes ahead would impact the DNSP, current users of

63 Clauses 5.3.5(a) and 5.3.6(a) of the NER.

64 Clauses 5.3.6(c) and 5.3.6(d) of the NER.

the network and other applicants wishing to connect to a specific location. For this reason, the draft rule sets a limit of 20 business days within which the connection offer remains valid. However, the parties can agree to extend this time subject to the delay not causing any significant impacts on other parties.

5.3 Other issues

A number of other issues related to the connection process were raised by the proponents or stakeholders, or identified by the Commission in its analysis. These are discussed below.

5.3.1 Impacts of the regulatory investment test for distribution (RIT-D)

Under the NER, where an investment in the network that is estimated to cost a DNSP more than $5 million, the DNSP must undertake the regulatory investment test for distribution (RIT-D). The RIT-D provisions allow DNSPs to consider the investment options that best address the needs of the network. The RIT-D establishes processes and criteria that are to be applied by DNSPs in circumstances where a network problem exists and the estimated capital cost of the most expensive credible option is above $5 million. Certain types of projects or expenditure are exempt for assessment under the RIT-D, including projects that relate to the replacement and refurbishment of existing assets. The RIT-D process requirements include specific provisions for consultation with stakeholders.

In some cases, it may be possible that a connection enquiry or application would be impacted by investments undergoing a RIT-D assessment. For example, a DNSP may be undertaking a RIT-D for a project to increase the transfer capability of one section of the shared network. An applicant may submit a connection enquiry or application for a project that would require that additional transfer capability being considered. In this case, the DNSP's response to the connection applicant may be subject to the outcomes of the RIT-D assessment. The draft rule takes into account this potential situation by requiring the DNSP to clearly explain the processes and potential impacts to the connection applicant. The DNSP would also be required to outline potential options that may be available on how the connection enquiry or application may proceed.

Given that the RIT-D process can take a number of months to ensure sufficient consultation is able to take place, in cases where connection enquiries or applications are impacted by a RIT-D assessment, the DNSP may agree with the applicant appropriate timeframes to respond to the enquiry outside of the timeframes discussed in section 5.2 above. Although the Commission does not expect such situations to arise on a regular basis, any comments on these provisions are welcome.

5.3.2 Connection process under Chapters 5 and 5A of the NER

The connection process that is under Chapter 5 of the NER and is the subject of the rule change request, can be used by any applicant wishing to connect to a distribution or transmission network. Although registered participants must use Chapter 5, ant party

may elect to use the process.[65] In contrast, the connection process under Chapter 5A applies to 'retail' customers and non-registered embedded generators. For this reason, the design and structure of Chapter 5A is to primarily accommodate basic and standard offerings.[66]

The proponents have stated that the connection process under Chapter 5 suits large generators and Chapter 5A is more suited to micro-embedded generation, particularly those that meet the requirements for a 'basic offer'. The proponents therefore considered there was a gap in the connection arrangements for installations between 10 kW and 30 MW. Other stakeholders noted that the Chapter 5A connection process had not been sufficiently tested and therefore it would be difficult to assess the efficacy of that process.[67]

The Commission considers that the amendments under the draft rule provide a clearer framework than the proposed rule and the current arrangements. This would assist all parties seeking to connect to the distribution network including the non-registered participants with installations in the 10kW to 30MW range. The process under the draft rule improves the availability of information and clarifies timeframes and obligations under the connection process. In keeping with the current arrangements, all parties may elect to follow the connection process under Chapter 5.

The Commission acknowledges that non-registered embedded generators would still be able to choose whether they would like to process their application to connect to the distribution network under Chapter 5 or Chapter 5A of the NER. Although, to provide regulatory certainty to all parties involved in a connection process, once an applicant has elected to initiate a connection under a certain chapter, the connection must be completed under that same chapter.

At this time the Commission does not consider that it would be appropriate to mandate a specific connection process to be used. Over time, should DNSPs develop more standard offerings that address specific classes of embedded generators, embedded generators may find the Chapter 5A connection provisions preferable to those under Chapter 5.

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65 Under clause 2.2.1 of the NER, AEMO may exempt a person or class of persons from the requirements to register as a generator. AEMO's guidelines exempt persons operating generating units with a nameplate rating of less than 5MW from registration. Those with a nameplate rating of between 5MW and 30MW may apply to AEMO for an exemption from registration.

66 Under Chapter 5A a basic connection service is a service provided to a micro embedded generator and a standard connection service is a connection service provided to a particular class of connection applicant for which the AER has approved a model standing offer submitted by a DNSP.

67 For example, Endeavour Energy, Consultation paper submission (pp 3-4), considered it was unnecessary to pre-empt the standard offers for connection under Chapter 5A by seeking amendments to Chapter 5. Ausgrid (p4) considered that further analysis should be undertaken to assess whether the introduction of Chapter 5A would address the issues raised prior to commencing further rule changes.

5.3.3 Ongoing reporting of connection outcomes

The proponents and some stakeholders considered that DNSPs had little incentive to complete connection processes in a timely manner and that there is a general lack of information and transparency on the requirements.[68]

The Commission considers there is merit in requiring DNSPs to report on the connection enquiries and applications they process to promote transparency and inform stakeholders of the connection process. The draft rule requires DNSPs to include in their DAPR statistics about the number of enquiries and applications processed and the average time taken to complete the processes. The provisions also include the requirement for DNSPs to report on any lessons learnt in the past year on processing connections.

These provisions would contribute to promote understanding of the connection requirements and provide some transparency on the DNSPs' activities. They could also provide an incentive for DNSPs to process enquiries and applications in accordance with the relevant requirements. Although there would likely be implementation and operational costs for DNSPs in undertake this reporting, the Commission notes that DNSPs should already have systems in place to track enquiries and applications. The reporting would also cover high level statistics and case studies. For these reasons the additional costs are likely to be incremental.

68 See Consultation paper submissions from the Clean Energy Council; ISPT Super Property; EnerNOC; Northern Alliance for Greenhouse Action; EEC; Infratil Energy Australia; and Sustainable Regional Australia.

6 Technical requirements for connection

This chapter sets out the Commission's views in relation to the technical standards for the connection of embedded generators to distribution networks, having regard to the views of stakeholders in submissions on the consultation paper. This chapter is structured as follows:

- section 6.1 summarises the provisions in the draft rule;
- section 6.2 outlines the current provisions under the NER relating to the technical requirements for connection to distribution networks;
- section 6.3 describes the proposed rule in relation to the introduction of technical standards for embedded generator connections and summarises stakeholder responses to the first round of consultation on this matter;
- section 6.4 sets out the Commission's assessment of the proposed rule in respect of technical standards for embedded generator connections; and
- based on the Commission's assessment in section 6.4, section 6.5 sets out the Commission's conclusions on this matter.

6.1 Overview of draft rule

The Commission's draft determination has recommended minor changes to Chapter 5 of the NER to address aspects of the technical requirements for connection. The draft rule requires each DNSP to publish a register of plant or associated equipment that complies with its minimum access standards. The draft rule also prescribes the technical information relevant to an application to connect that must be included in the preliminary and detailed responses to a connection enquiry.

In those circumstances where a connection applicant and DNSP are unable to agree on the technical requirements for a connection, the draft rule introduces a new dispute resolution process. A summary of the key recommendations in comparison with the current provisions and the rule change request is set out in the following table.

Table 6.1 Technical requirements under the draft rule - comparison with existing provisions and the rule change request

Current NER provisions	Rule change request	Draft rule
Technical requirements for connection (see section 6.4.1)		
The specific technical requirements that connection applicants must adhere to are located in the schedules to Chapter 5. Schedule 5.2 specifically outlines the conditions for connection of generators. However, this schedule does not apply to participants that are exempt from registration with AEMO as a generator. As such, it does not apply to embedded generators with a nameplate rating of less than 5 MW. As a result, the relevant technical requirements are determined by DNSPs based on network and jurisdictional requirements.	Proposed automatic access standards for embedded generators. This would allow the automatic right of connection of embedded generators that met that standard. The rule change request did not provide any additional information on what technical requirements would be covered by the automatic access standard, only that it should be inserted as a new schedule in Chapter 5.	The draft rule does not provide for a technical standard to apply to embedded generators, or an automatic access standard. However, for generating plant that meets minimum access standards, the draft rule places an obligation on DNSPs to publish a register of this equipment. Further, to cover those aspects of Schedule 5.2 relevant to the connection of embedded generators, the preliminary response to a connection enquiry details the technical requirements that a DNSP must make available to the connection applicant.
Dispute resolution process (see section 6.4.1)		
Part L of Chapter 6 provides for dispute resolution for terms of access under clause 5.5 (an access dispute for the purposes of the NEL). Part B of Chapter 8 sets out the general processes for dispute resolution under the NER.	The proposed rule did not suggest amendments to the dispute resolution process. However, consultation with stakeholders indicated that the Chapter 8 dispute resolution process was not working adequately.	The draft rule outlines a process where either connection applicants or DNSPs are able to appoint an independent engineering expert to assess the reasonableness of any technical requirements during the connection process.

6.2 Current provisions

Chapter 5 of the NER contains the existing provisions to allow for the connection of generators and market customers (that is, load). However, as the NER caters for all distribution and transmission network connections, it tends to be fairly generic and high level in its application. With respect to the connection of generation, the specific technical requirements that connection applicants must adhere to are located in a number of schedules to Chapter 5. As noted above, Schedule 5.2 which outlines the technical requirement for the connection of generators, does not apply to those participants that are exempt from registration with AEMO. Accordingly, Schedule 5.2 is unlikely to apply to most embedded generators.

The schedules applicable to the connection of generation are:

- Schedule 5.1a - system standards. This schedule outlines the system standards that are necessary or desirable for the safe and reliable operation of the facilities of registered participants and for the safe and reliable operation of equipment. The system standards consist of:
  - the requirements for a frequency operating standard;[69]
  - the requirements for system stability;
  - power frequency voltage;
  - voltage distortion, unbalance and fluctuations; and
  - fault clearance times
- Schedule 5.1 - network performance requirements to be provided or co-ordinated by NSPs. This schedule outlines among other things, the requirements on NSPs to develop consistent processes to determine the appropriate technical requirements to apply for each connection enquiry or application to connect processed by the NSP with the objective that all connections satisfy the requirements of this schedule. In particular, the criteria and obligations of participants required to achieve a specific level of network service at an individual connection point.
- Schedule 5.2 - conditions for connection of generators. This schedule sets out details of additional requirements and conditions that generators must satisfy as a condition of connecting a generation system to the network. The schedule outlines the minimum, automatic and negotiated access standards for each technical aspect of a generation connection. It should be noted that this schedule does not apply to those participants that are exempt from registration with AEMO as a generator. That is, for those embedded generation systems less than 5MW and exempt from registration with AEMO, this schedule would be unlikely to apply.
- Schedule 5.3 - conditions for connection of customers. This schedule sets out details of the requirements and conditions that customers must satisfy as a condition of connecting load to the power system. This schedule can apply to embedded generators because they can also be load customers.
- Schedule 5.4 - information to be provided with a preliminary enquiry. This schedule identifies the information required to be submitted with a preliminary enquiry for connection or modification of an existing connection. This schedule is relevant to anyone connecting in the NEM.

69 The frequency operating standards are system standards and are as determined by the Reliability Panel and published by the AEMC.

- Schedule 5.5 - technical details to support both an application for connection and subsequent connection agreement. Various sections of the NER require that participants submit technical data to NSPs. This schedule lists the range of data which may be required. The actual data required will be advised by the NSP, and will form part of the technical specifications in the connection agreement.

- Schedule 5.6 - terms and conditions of connection agreements. This schedule sets out the specific conditions that connection agreements must contain in relation to connection and access to a network. This schedule is relevant for all registered participants including generation and load.

- Schedule 5.7 - annual forecast information for planning purposes. This schedule sets out the information in respect of each connection point that must be provided to the relevant NSP by each registered participant that has a connection point to a transmission network of that NSP. This schedule is relevant for all registered participants including generation and load.

6.3 Proposed rule

The proposed rule sought the inclusion of a new schedule in Chapter 5 that set out the automatic access standards to apply to the connection of embedded generators to the distribution network. However, the proposed rule did not specify the types of information to be provided in this schedule.

In support of its proposal to clarify the technical standards applying to embedded generators, the Property Council of Australia's embedded energy technical working group (working group) provided a supplementary submission outlining how the schedules in Chapter 5 of the NER could be amended to support an automatic right of connection for these generators.[70] This submission contained observations on changes to the following schedules 5.1a, 5.1, 5.2, 5.3, 5.3a, 5.4, 5.5, 5.6 and 5.7. For each schedule, the technical requirements for the connection of generation have been reviewed by the working group and those aspects that are not applicable to medium sized generators (with ratings up to and including 5 MVA) have been removed and/or marked with comments by the working group. Where a specific clause has been marked for deletion, the working group have provided a short commentary outlining the reasons to support its deletion.

6.3.1 Proponents' view

The proponents have submitted that the technical requirements for the connection of embedded generation in the NEM are diverse. That is, they vary both across jurisdictions, and in some cases within the same jurisdiction depending on the DNSP.[71]

70 Property Council of Australia, Consultation paper supplementary submission.

71 Rule change request, p12.

The proponents considered that DNSPs appear to have considerable discretion regarding the technical standards they may impose on embedded generators connecting to their network. Therefore, the technical requirements that apply in each distribution area appear to reflect the individual DNSP's circumstances. This may at times be exacerbated by a perception that any connection must be at a level that provides maximum protection to network infrastructure and integrity of the grid more generally.[72] The proponents note that this diversity may be in part due to a lack of nationally consistent technical standards applying uniformly across the NEM.

In addition, the proponents have noted that in circumstances where the technical standards are not clearly and comprehensively defined by the DNSP, this may lead to significant costs and may undermine the viability of an embedded generation project.[73]

The proponents also submitted that the DNSPs' views about the appropriate technical solutions are binding and there is little latitude for negotiation. This may occur despite instances where newer, or more appropriate, technical solutions are available to the project proponent. Also, some technical requirements imposed by DNSPs disallow exports of electricity to the distribution network.[74]

To address these concerns with the technical requirements of connection, the proponents proposed the development of an automatic access standard for the NEM. This automatic access standard would be included in the NER. In this way generating plant that meets the specified standard would have the right to connect to the relevant network, and the DNSP would not be able to refuse. The proponents consider this would create a transparent and consistent framework regarding the technical requirements necessary for connecting embedded generation.[75]

The proposed automatic access standard would provide embedded generators that are unlikely to compromise the integrity of the grid with an automatic right of connection to a distribution network. The proponents recognised this is a long-term goal, but that it would enable embedded generators to connect to the distribution network more easily.[76]

In addition to this automatic right of connection, the proponents have also requested changes to the NER to entitle embedded generators to export electricity to the distribution network.[77] That is, DNSPs will be required to ensure, even if augmentation is necessary, that the distribution network is able to receive electricity from an embedded generator.[78]

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72 ibid.

73 ibid.

74 ibid.

75 ibid, pp 14-15.

76 ibid.

77 ibid.

78 ibid, p 28.

The proponents consider that the development of an automatic access standard should be provided under the NER as a matter of priority for cogeneration systems up to 5 MW because, relative to their size and capacity, the current costs of connection are disproportionately high and the connection process unduly burdensome. The proponents also proposed that as automatic access standards are developed for larger cogeneration plants with a nameplate capacity between 5 MW and 30 MW and approved, automatic access would be extended to these larger projects consistent with these standards.[79]

The automatic access standard for cogeneration plants should, in the proponents' opinion, be complemented by a standard connection agreement similar to the model standing offer provided for under Chapter 5A. In particular, Chapter 5A required DNSPs to have in place a model standing offer for micro-embedded generators, which must include terms and conditions dealing with timeframes for connection, safety and technical requirements and the costs of connection.[80]

The proponents also requested changes to the NER to require DNSPs to publish an annual report identifying where network capacity may be limited.[81]The proponents acknowledged that the AEMC was already considering whether such information would be included in the new Distribution Annual Planning Review requirements.[82]

6.3.2 Stakeholder views - consultation paper

Technical requirements for connection

Development of nationally consistent technical standards

In relation to the development of technical standards for the connection of embedded generators, there appeared to be general agreement among stakeholder submissions (including both project proponents and DNSPs) that standards should be developed.

However, from the viewpoint of DNSPs, "what" is proposed to be connected and "where" it is to be connected should remain an integral aspect of the requirements in the process to connect.[83] That is, it is difficult to standardise the technical requirements for the connection of embedded generators completely.

In relation to the development of nationally consistent technical standards, many stakeholders considered that this would be difficult to achieve in a timely manner. This is primarily because the important technical parameters for the connection of embedded generators vary depending on the installed capacity (size) and the type of

79 ibid, pp 14-15.

80 ibid, p14.

81 ibid.

82 ibid, p18.

83 Essential Energy, Consultation paper submission, p2.

generator (invertor, asynchronous, or synchronous).[84] On this basis, the ENA noted that any standards should be relatively high level, performance focussed documents with minimal prescriptive content to allow embedded generators to arrive at an optimal solution.[85]

A number of stakeholders noted that Australia is lagging behind many overseas countries in the development of technical standards for embedded generation.[86] It was suggested that adoption of international standards, or particular aspects of existing international standards, may be more advantageous than developing a standard within Australia.[87]

Furthermore, many of the key jurisdictional differences that exist between distribution networks are as a result of differing licencing conditions relating to safety and reliability inherent to each jurisdiction.[88] Given that these differences currently form part of the jurisdictional requirements, it may not be possible to develop a set of completely homogenous technical standards applicable to all distribution networks across the NEM.[89] As a result, each DNSP has developed its own set of technical requirements pursuant to its jurisdictional needs.[90]

EnerNOC submitted that the equipment used for connecting embedded generation is "bought off the shelf" from a small number of international suppliers and is therefore constructed to meet relevant international requirements. In its view, the generating plant should therefore be able to be used in Australia.[91] The ENA was strongly of the view that any equipment should be certified to an acceptable and relevant international or Australian standard.[92]

Automatic access standards

ETSA Utilities and the ENA supported the publishing of automatic access standards for some aspects of the connection process only, including the generating units and associated protection and control equipment.[93] However, the assessment process

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84 Jemena, Consultation paper submission, p9; EnerNOC, Consultation submission, p3; Endeavour Energy, Consultation paper submission, pp 14-15; Ausgrid, Consultation paper submission, p20; City of Sydney, Consultation paper submission, p6; Wood & Grieve Engineers, Consultation paper submission, p4.

85 ENA, Consultation paper submission, p23.

86 SP AusNet, Consultation paper submission, p2; City of Sydney, Consultation paper submission, pp 5-6.

87 EnerNOC, Consultation paper submission, p2; SP AusNet, Consultation paper submission, p2.

88 Ausgrid, Consultation paper submission, p4.

89 DMITRE, Consultation paper submission, p4; ENA, Consultation paper submission, p23; Energex, Consultation paper submission, p4.

90 Ausgrid, Consultation paper submission, p2; ENA, Consultation paper submission, p20; Energex, Consultation paper submission, pp 11-12; Essential Energy, Consultation paper submission, pp 3-4.

91 EnerNOC, Consultation paper submission, p2.

92 ENA, Consultation paper submission, p23.

93 ETSA Utilities, Consultation paper submission, p6; ENA, Consultation paper submission, p20.

should also determine the potential impact on network safety and security of supply and any shared network augmentation required to address this, which must be done on a case-by-case basis. Therefore, for these aspects they argue there is no opportunity to allow an automatic right of access.[94]

On the other hand, CitiPower and Powercor stated that before any automatic access standards are implemented, many DNSPs would require investment to be undertaken to alleviate the fault level constraints that already exist.[95]

Origin Energy noted that the concept of an automatic access standard was a good idea in principle, but may have limited value in practice. It also stated that the automatic access standard for large generators was set at a sufficiently high level to minimise the risk of adverse effects to the network. It was not aware of a connection agreement that uses the automatic access standard.[96]

The Energy Supply Association of Australia (esaa) considered it premature to implement an automatic access standard before a national access standard had been developed.[97] The esaa noted that while it was worthwhile developing a national access standard, if the AEMC decided to develop these standards then the rule change should be deferred until these standards are developed.[98]

Dispute resolution

Through consultation with stakeholders and comments made by stakeholders at the workshop held on the connection process, many have noted that they are not comfortable using the dispute resolution process with the Australian Energy Regulator (AER) under the existing framework (contained in both the NER and the NEL). There appears to be a perception among connection applicants that using this dispute resolution process results in them being placed on a 'black list' with the DNSP, making it very difficult to negotiate future connection agreements.

Automatic right to export

Alinta Energy considered that the right to export should be divorced from automatic access considerations.[99] It noted that the right to export requires discrete consideration by the affected DNSP including ensuring that the embedded generator connection does not unduly degrade the capability of the network.[100]

94 ibid.

95 CitiPower & Powercor, Consultation paper submission, p6.

96 Origin Energy, Consultation paper submission, p3.

97 esaa, Consultation paper submission, p3.

98 ibid.

99 Alinta Energy, Consultation paper submission, p2.

100 ibid.

Many DNSPs stated that they do not disallow the export of electricity to the grid. However, in many cases the ability to export may be constrained by the capability of the distribution network, which may need to be augmented by the connection applicant to allow the level of export desired.[101] Therefore, whether the export of energy to the grid proceeds is dependent on technical and commercial decisions made by the embedded generator proponent.[102] In particular, ETSA Utilities noted in its experience, embedded generators have been allowed to export electricity to the distribution network where:[103]

- the appropriate network analysis has been undertaken to confirm the safety and security of the distribution network;
- any required shared network augmentation to facilitate the export of electricity has been undertaken; and
- a network connection agreement, including a maximum export capacity has been signed by ETSA Utilities and the connection applicant.

The ENA opposed an automatic or unlimited 'right' to export to the grid, as no other generator has such a guarantee.[104] In its view, the overriding requirement that networks must operate in a safe and reliable way, often necessitates limits on the export of electricity. To be allowed to connect to the network, a generator must satisfy the DNSP's technical requirements to maintain safety, protection of equipment, reliability and quality of supply to customers. The ENA noted that these obligations are applicable to all customer connections, but recognised that it is typically more technically complicated to connect a generator that can export electricity to the network than it is to connect a load of a generator that will not export.[105]

The esaa similarly considered that the right to export should only be granted where the network can safely handle export from an embedded generator.[106] The esaa's reasoning was related to the NEO: it considered that the reliability, safety and security of the national electricity system should remain the primary concern when deciding whether to allow the export of electricity from an embedded generator.[107]

System fault level limitations

The CEC noted that "in general, and especially with regards to generation located in central business districts, fault level concerns would be the main driver for this

101 SP AusNet, Consultation paper submission, p2; Ausgrid, Consultation paper submission, p12.

102 SP AusNet, Consultation paper submission, p2; Jemena, Consultation paper submission, pp 9-10.

103 ETSA Utilities, Consultation paper submission, p5.

104 ENA, Consultation paper submission, p2.

105 ibid., p24.

106 esaa, Consultation paper submission, p3.

107 ibid.

refusal".[108] However, the CEC also stated that loads such as motors and other devices also increase fault levels within a distribution network. Therefore the continued refusal of embedded generation connections was hard to justify. That is, transparency is required in order to identify the issues and properly inform connection applicants to make efficient investment decisions.[109]

EnerNOC emphasised the importance of providing all information relevant to generator proponents, such as fault level headroom in each area, and what the DNSP is planning to do to rectify this, if it is too low.[110] In light of these comments, CitiPower and Powercor noted that they had sought approval from the AER as part of their 2011-2015 distribution determination for funding to increase the fault level headroom in their networks.[111] However, the AER did not approve this funding increase on the basis that such investment should be funded by embedded generators rather than all customers more generally.[112]

6.4 Commission's assessment

6.4.1 Technical requirements for connection

Development of nationally consistent technical standards

The technical requirements contained in Schedule 5.2 of the NER are applicable to all generators that are registered participants under the NER. These standards set out the conditions for connection of generators to transmission and distribution networks. In particular, clause S5.2.5 relates to technical requirements for the connection and continued operation of generators in the NEM.

Mid-scale embedded generators are typically classed as those with a nameplate rating between 30 kW and 5 MW. Clause 2.2.1(c) of the NER requires AEMO to develop guidelines relating to the registration of generators in the NEM. Under the current guidelines, generators with a nameplate rating less than 5 MW are currently exempt from registration with AEMO. AEMO's NEM generator registration guide states that this exemption is primarily because these facilities are not expected to "significantly affect market outcomes or impact power system security". AEMO's registration guide also allows those generators with a nameplate rating of more than 5 MW, but less than 30 MW, to apply for exemption provided that their generating system exports less than 20 GWh in any 12-month period.[113] AEMO's registration guide also states the "conditions for connection of generators do not apply to your facility if you are eligible

108 CEC, Consultation paper submission, p8.

109 ibid.

110 EnerNOC, Consultation paper submission, p5.

111 CitiPower & Powercor, Consultation paper submission, p6.

112 ibid.

113 Australian Energy Market Operator, NEM generator registration guide, December 2012, pp 35-37.

for exemption from registration in respect of the facility and the facility is connected or intended for use in a manner the Network Service Provider considers is unlikely to cause a material degradation in the quality of supply to other network users".[114]

However, guidelines and electricity codes in each jurisdiction still require DNSPs to comply with the technical requirements of Schedule 5.2 of the NER, despite the NER not requiring these exempt generators to comply with them under clause S5.2.1(b)(1). As a result, many DNSPs have published a guideline, or suite of guidelines, that detail the technical requirements for the connection of embedded generators. These guidelines are generally similar in scope to the NER requirements under Schedule 5.2, but in some instances contain less detail for some technical requirements relating to power system security.

In considering the development of the technical requirements for the connection of embedded generators, the Commission has had regard to both the equipment and network connection requirements.

Equipment requirements

Generator equipment requirements relate to the standard to which the generation unit and the generator protection schemes are constructed. For most embedded generation projects, the proponent is solely responsible for the generating unit and its plant protection, any internal protection requirements downstream of the point of supply, and any control systems in place on the proponent's equipment.[115] Any generating plant that is installed in the NEM must adhere to the frequency operating standards as determined by the Reliability Panel and voltage limits applicable to its location as advised by the local DNSP.[116]

In relation to the installed equipment, the DNSP must be confident that the proponent's embedded generating system, as seen from the point of supply and/or generator connection, operates correctly and as agreed. In assessing whether this is the case, the DNSP has the right to witness all equipment testing of the generating plant undertaken by the embedded generation proponent. The NER makes reference to these provisions under rules 5.7 and 5.8.

Network connection requirements

The network connection requirements relate to the protection elements required at the point of supply. These elements are particularly important in maintaining the safety, security and reliability of the DNSP's distribution assets. Many of the licencing conditions throughout Australia give DNSPs the right to approve protection and

114 ibid. p14.

115 J.A. Pec¸as Lopes et al, 'Integrating distributed generation into electric power systems: A review of drivers, challenges and opportunities', *Electric Power Systems Research*, vol 77, 2007, pp1189-1203.

116 The Frequency Operating Standards for the Mainland NEM and Tasmania may be found at: www.aemc.gov.au/panels-and-committees/reliability-panel/guidelines-and-standards.html

control settings in relation to connection to the distribution network and where appropriate, witness the testing of those systems.

It is important from the perspective of the DNSP that all protection elements are 'certified'. That is, the installation needs to be tested by a competent tester (in some Australian jurisdictions, a professional electrical engineer) in the presence of the DNSP. The testing usually involves, but is not limited to: synchronising checks, and proving loss of mains and neutral over-voltage protection. For the DNSP this testing provides assurance that in the event of a fault, the embedded generation unit will quickly disconnect from the distribution network and completely isolate itself, minimising safety concerns to people.[117]

In many cases, the technical requirements relevant to the protection parameters are dictated by the individual DNSP and are specific to the connection location. In relation to other protection requirements, the following provides an overview of some other important considerations for the connection of embedded generators:

- the size of the embedded generator and interconnection voltage;
- the type of embedded generator (for example, synchronous, asynchronous, or inverter);
- export versus non-export of electricity;
- depends on transformer connection;
- the minimum requirements for voltage and frequency protection, including:
  - islanding - where the embedded generator separates from the distribution network;
  - protect utility system from fault contribution and transient voltage conditions caused by the embedded generator; and
- power quality, including:
  - voltage flicker; and
  - harmonics.

International literature indicates that it is often difficult to provide 'concrete' technical standards that are relevant to all network configurations and conditions. While international standards provide overarching requirements, the detailed decisions on each connection requirement still necessitate individual DNSPs to exercise their own judgement. This is based on prevailing technical standards, such as Institute of

117 Ausgrid, NS 194, Connection of Embedded Generators, August 2008.

Electrical and Electronics Engineers (IEEE)[118] North American or International Electrotechnical Commission (IEC)[119] standards, as well as local network design and operation standards and requirements.[120]

Given the complexity, time and expertise required to develop a nationally consistent set of technical requirements applicable to all embedded generation connections, the Commission does not consider it appropriate for it to be at the forefront of the development of these technical standards at this time. The rationale for this position is that the development of nationally consistent technical standards would:

- potentially require a suite of standards to be developed for various sizes and types of embedded generation;
- require significant technical expertise from a range of stakeholders within the industry;
- require a substantial amount of time to develop. For any developed standards to apply across Australia approval by Standards Australia would be required. In the absence of this process, any standards developed by the AEMC would only apply to the NEM jurisdictions under the NER.
- require the Commission to significantly delay completion of this rule change request, as it is not able to progress some parts of a rule change request and not others; and
- duplicate a body of work that is being undertaken by Department of Resources, Energy and Tourism (DRET) into the feasibility of developing mid-scale embedded generation connection standards.

Feasibility study into the development of mid-scale embedded generation connection standards

Of particular relevance to this rule change request is a feasibility study being overseen by DRET. For this feasibility study, DRET has engaged AECOM Australia (AECOM) to investigate the development of a grid connection technical standard for mid-scale embedded generators. The purpose of the study is to examine whether it is feasible to develop technical standards for the connection of mid-scale embedded generation (30 kW to 5 MW) to the electricity distribution networks in Australia.

118 The IEEE developed the IEEE 1547 set of standards for the interconnection of distributed resources with electric power systems, which have been made national law in the United States through the Energy Policy Act of 2005.

119 The IEC is the world's leading organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

120 AECOM Australia, *Mid-Scale Embedded Generation Connection Standards - Feasibility Study Interim Report*, p11.

AECOM's Interim Report was published for consultation by DRET in April 2013. DRET is seeking submissions on the Interim Report from industry stakeholders and the government.

The recommendation outlined in the Interim Report is that there "appears to be significant interest and appetite from all stakeholders who have participated in the consultation process to develop a standard or suite of standards that covers the technical issues relating to the connection of mid-scale embedded generation within Australia".[121]

The report further stated that "a connection standard that balances the costs and benefits would offer benefits beyond potential improvement to the connection process in terms of clarity, certainty, outcome predictability and cost to embedded generator connections".[122] A defined technical standard would also "contribute to improving national consistency and promoting common industry practices in distribution network planning, design and operations".[123] Furthermore, a defined standard could contribute to standardisation of equipment, which would lead to cost reductions in equipment, streamlined installation practices, and operational consistency.

AECOM recommended that it was most appropriate that a standard or suite of standards be developed rather than an industry guideline. This recommendation was based on promoting greater consistency in the process employed by DNSPs to connect embedded generation. While a reference in the NER was considered appropriate, the NER only covers those DNSPs in the NEM and any reference in the NER would not extend to Western Australia and the Northern Territory. Therefore, AECOM also recommended that any standard developed should be "referenced or enforced by the state and territory technical regulatory bodies".[124]

AECOM noted that the development of any technical standard would require significant time and resources. Further, broad stakeholder participation in the development of any standard was crucial to its success. This is primarily because any standard not only impacts on the technical requirements of a project, but also business processes, project risk, capital cost and return on investment for multiple parties.

During consultation, AECOM identified a number of issues that stakeholders had consistently indicated are required to be reviewed on a cases-by-case basis. These include:[125]

- Protection related requirements:

121 AECOM Australia, *Mid-Scale Embedded Generation Connection Standards - Feasibility Study Interim Report*, piii.

122 ibid.

123 ibid.

124 ibid.

125 ibid., p13.

  - pole-slip;
  - breaker fail;
  - inter-trip
- Reactive power, voltage control and regulation
- Power system stabilisers
- Remote monitoring, communications and metering
- Safety related requirements:
  - impedance earthing
  - auxiliary supplies via a different point of common coupling
  - interlocking.

AECOM also considered that mid-scale embedded generators are unique in that generally they have negligible impact on power system security. That is, they need less stringent requirements on operating characteristics and protection, remote control and monitoring capability than larger generators. However, they are more prone to fault level limitations and power quality issues at the connection point. Therefore, some technical requirements are unique to mid-scale embedded generators compared to smaller embedded generators, including:

- Protection related requirements:
  - redundancy
  - main and backup
  - breaker fail
  - inter-trip
  - impact on protection settings near the point of common coupling
- Response to disturbances:
  - fault level contribution and clearance times
  - breaker fail
  - delivery of active power and the ability to supply or absorb reactive power, including maintenance of the point of common coupling voltage level
- Impact on network capability.

AECOM is expected to release its final report prior to publication of the AEMC's final rule determination. This will provide the AEMC and stakeholders with a greater understanding of the future direction for the development of national technical standards.

In the absence of nationally consistent technical standards, but with a view to increasing transparency, the Commission has decided that some improvements in the NER can be made. These changes are with respect to equipment standards, network connection requirements and a dispute resolution process relating to the technical requirements. The details of these are set out below.

DNSPs to publish a register of generating plant that meets minimum access standards

Stakeholders have noted that a connection to the distribution network should not be limited where a piece of generating plant that meets the minimum technical requirements is met. As stated above, EnerNOC submitted that the equipment used for connecting embedded generation is "bought off the shelf" from a small number of suppliers operating internationally. The generating plant is therefore constructed to meet relevant international requirements and should be able to be used in Australia.[126]

On the other hand, AECOM has observed in its Interim Report that there appears to be a lack of standardisation of embedded generation equipment from manufacturers.[127]

However, it is understood from discussions with equipment manufacturers that generation equipment sold in Australia is produced to be compliant with the requirements of Schedule 5.2 of the NER. The requirements under Schedule 5.2 of the NER are fairly broad, but it is likely that most equipment will meet the relevant minimum technical requirements for connection. It is also unlikely from a practical business perspective that manufacturers will sell equipment that cannot be connected to the distribution networks of Australia.

Therefore, given that generator equipment is produced by a small number of manufacturers operating internationally adhering to the requirements of the NER and other relevant international standards, the Commission expects that there will be a degree of uniformity. For this reason, the Commission is recommending that the NER require DNSPs to publish and maintain a register of generating plant that complies with its minimum technical requirements. The DNSP would be required to review this register of generating plant at a minimum every two years.

As an example of how this recommendation may look in practice, AS4777 allows for the pre-approval of inverters for the connection of solar photovoltaic installations of

126 EnerNOC, Consultation paper submission, p2.

127 AECOM Australia, Mid-Scale Embedded Generation Connection Standards - Feasibility Study Interim Report, p2.

3 kW or less.[128] The inverter and protection equipment must be certified by a recognised testing laboratory and approved prior to being connected to the distribution network. It is the manufacturer's, or their agent's, responsibility to formally seek approval and to ensure that the inverter's certification remains current.

Each DNSP provides a list of those inverters that have been assessed and approved as meeting the criteria which makes them suitable for connection to the distribution network. The Commission recognises that this approval process is based on a defined Australian standard. As noted by the ENA, any equipment should ideally be certified to an acceptable and relevant international or Australian Standard.[129] Similarly, the register of compliant equipment would only be applicable to each DNSP.

Even in the absence of an Australian based standard, DNSPs that have connected embedded generators will know what types of generating plant have already successfully met their minimum technical requirements. Therefore, a DNSP should be able to provide this information to a connection applicant.

The register would provide connection applicants with upfront information and a guide to available equipment applicable to that DNSP, but does not oblige them to use any of the equipment on the register. Alternatively, a DNSP is not obliged to accept an application to connect containing compliant equipment if specific locational limitations, or other requirements, prevent its connection.

This register of generating plant would not preclude DNSPs from also providing additional guidance around the connection requirements for this equipment to the distribution network. Notwithstanding, providing this information would provide a degree of certainty that is currently lacking in the current connection process. In time, this recommendation may also encourage manufacturers to ensure they supply generation equipment that meets the minimum technical requirements for connection in Australia. It may result in the emergence of those key features of equipment important for connecting embedded generation to distribution networks.

The Commission understands that this plant register imposes a cost and regulatory burden on DNSPs to publish and maintain. However, it considers that the benefits to the market of more transparent and upfront information on the equipment for connecting embedded generators will outweigh this cost.

NER to contain high level detail on technical network access requirements

The technical requirements for the connection of embedded generators are essentially the same as for large generators under Schedule 5.2 of the NER, but with less stringent requirements on operating characteristics and protection, remote control and

128 AS4777.3, Australian Standard, Grid Connection of Energy Systems Via Inverters, Part 1: Installation Requirements, Part 2: Inverter Requirements, Part 3: Grid Protection Requirements, Standards Australia, 2005.

129 ENA, Consultation paper submission, p23.

monitoring capability.[130]This is due to mid-scale embedded generators having a relatively small impact on overall system security compared with larger generators that require extensive compliance assessments to ensure safe operation.

However, as noted above, for DNSPs, the equipment to be connected and the location of connection should remain an integral aspect of the technical requirements in the process to connect. When assessing a connection enquiry and/or application, the DNSPs are conscious of how the proposed connection will interact with the distribution network around the point of connection. Of particular importance is how the proposed connection may affect the safety, security, quality and reliability of the supply of electricity to other network users adjacent to the connection point.

For this reason, DNSPs will undertake network studies to determine the extent of any impact on the distribution network around the point of connection. Ausgrid suggested that there appears to be a perception among connection applicants that these network studies are undertaken by the DNSP to obstruct the connection and impose undue burdensome technical requirements, resulting in delays to the processing of applications and imposing prohibitive costs.[131]

However, DNSPs consider it necessary to undertake these network studies on a case-by-case basis, given the importance to maintain safety to customers and the public, protection of equipment and reliability and quality of supply. These network studies are not limited to assessing generation connections. They may also be used by DNSPs to assess any necessary changes to the network to enable the connection of load.[132]

The technical requirements necessary for DNSPs to assess the impact of the proposed embedded generator on the distribution network are diverse. The technical requirements to be coordinated include, but are not limited to: protection and control settings including fault level coordination and fault clearance times; metering; interlocking and isolation; switching and operational arrangements; and plant capabilities and conformance to existing Australian Standards.

Currently, some DNSPs provide high level information in their connection guidelines for some of the above technical requirements. However, the extent to which this information is contained in the connection guidelines and any specific limits or requirements varies by DNSP.

As the development of a nationally consistent technical standard will take some time, the Commission's draft rule sets out the technical requirements that DNSPs must make available to connection applicants. Where applicable, these technical requirements will

130 AECOM Australia, *Mid-Scale Embedded Generation Connection Standards - Feasibility Study Interim Report*, p12.

131 Ausgrid, Consultation paper submission, pp 6-7.

132 The technical requirements that a DNSP must take into account when connecting load are set out in Schedule 5.3 of the NER. They include aspects relating to design standards and protection systems and settings.

be premised on the minimum access standards necessary to maintain system security and reliability of supply. This information is to include:

- design at the connection point;
- physical layout adjacent to the connection point;
- primary protection and backup protection;
- control characteristics;
- communication facilities;
- insulation co-ordination and lightning procedures;
- switching and isolation facilities;
- interlocking and synchronising arrangements; and
- metering installations.

DNSPs will be required to make this information available as part of its preliminary response to a connection enquiry. There may be merit in a matrix style approach where the information is disaggregated by the size or location of the embedded generator within the network, as is done in some jurisdictions overseas.[133]

In the absence of a technical standard for the connection of embedded generation, specifying in the NER an obligation for DNSPs to provide connection applicants with those minimum technical requirements necessary to maintain system security and reliability of supply will enhance transparency and certainty for connection applicants. Greater transparency in the connection process and certainty to connection applicants on the specific technical requirements will lead to efficient investment in embedded generation for the long term interest of end consumers.

Independent engineering expert appraisal for technical dispute

Stakeholders have stated that the current dispute resolution process in the NER does not meet their needs. It is also understood that there will be instances where the DNSP and connection applicant are not in agreement on the technical requirements applicable to a particular connection.

Where agreement cannot be reached on the reasonableness of any technical requirements, either the connection applicant or the DNSP should have the option to appoint an independent engineering expert to provide their opinion to assist in the

133 For an example, see the technical specifications form for NEW Zealand's Mainpower - distribution generation with capacity for 10kW of greater at: www.mainpower.co.nz/index.cfm/1,412,0,42,html/Distributed-Generation-with-Capacity-for-10kW-or-Greater

parties reaching agreement.[134] The choice of the engineer is to be agreed between the DNSP and the connection applicant, and the cost of the engineer's services should be shared equally between the two parties. This draft rule is consistent with the Commission's advice in the transmission frameworks review.

In those circumstances where either or both parties are not able to agree on the appointment of an independent engineer, the draft rule has made provision for the AER to nominate one.

The engineer's opinion would not be binding on the parties, but would assist the parties to come to a view on whether the technical requirement about which there is dispute is being treated fairly and reasonably. This should help to resolve some disputes between parties. If not, the opinion will be admissible as evidence and so should help to inform the AER's view in any subsequent dispute resolution process under Chapter 8 of the NER, or an access dispute under Chapter 6 of the NEL.

While the NER does not prevent either party employing an engineering consultant to provide their opinion, making an explicit provision would drive the independence of the engineer's opinion. This would give it greater weight in any negotiation process or subsequent dispute resolution.

As noted above, either party could elect to request that an opinion be sought from an independent engineer, but the independent engineer's costs would be borne equally. This has two advantages. First, it provides an incentive on both parties to reach agreement without the engineer in order to avoid costs. Second, the engineer's independence is clear and beyond a suggestion of bias.

The engineer could be engaged at any stage in the connection process up until the connection agreement is signed by both parties. One area where an independent engineer is likely to be valued, particularly by the connection applicant, is in assessing the appropriateness of the DNSPs technical requirements as part of the detailed enquiry response. The DNSP's detailed enquiry response will outline the agreed project framework and the technical requirements for connection to the distribution network.

Where the connection applicant does not agree with the DNSP's proposed agreed project, the services of an independent engineer may be utilised to provide an opinion on the fairness and reasonableness of the DNSP's technical requirements. The scope of those technical requirements where either party may seek the opinion of an independent engineer are outlined in clause 5.9A.1 of the draft rule.

The ability to appoint an independent engineer may act to deter DNSPs from over-specifying the protection equipment and/or technical requirements required as part of any connection to the distribution network.

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134 In practice this is likely to be an engineering firm, but could be an individual as long as both parties agree.

Examples of other issues where the parties may wish to have an independent expert appraisal could include:

- the nature of any constraints arising in relation to the connection of the embedded generator (as identified by the DNSP); and
- the options for solving any constraint (that is, connection options and/or shared network augmentation).

6.4.2 Automatic right to export

The ability for embedded generators to export excess electricity is dependent on the capability of the distribution network to receive this excess electricity at the point of connection. DNSPs are able to support the export of electricity from embedded generators to the grid where the embedded generator demonstrates to the satisfaction of the DNSP that its connection will not adversely affect network stability, power quality, supply reliability, or safety.

Where the network is not able to safely and reliably accommodate electricity exported by embedded generators, augmentation of the network will often be necessary if exported capability is required for the project to proceed. The cost of any necessary network augmentation in these circumstances is borne by the embedded generator. Therefore, following consultation with the DNSP regarding the network capability at the connection point, it is a choice for the embedded generator between generator size and export quantities versus the shared network augmentation costs required to remove any identified constraints.

As such, any export of electricity to the distribution network requires consideration by the DNSP on a case-by-case basis. This includes ensuring that the embedded generator connection does not unduly degrade the capability of the distribution network for all other network customers. That is, the right to export is available subject to the technical and commercial decision making of the project. The embedded generator should have an appropriate agreement with the DNSP, usually as part of the connection agreement.

In light of the discussion above, the Commission considers that any export of electricity from an embedded generator to the distribution network should be based on explicit agreement between both parties. Where there is agreement that the proposed connection will not adversely affect network stability, power quality, supply reliability, or safety (or all necessary shared network augmentation has been completed to avoid these adverse outcomes) exports can occur. As non-market generators are required to sell their electricity to either the local retailer or local customers, an embedded generator would also be required to sign a power purchasing agreement with its local retailer, or have appropriate contractual agreements in place with local load customers for the sale of any exported electricity. An embedded generator may also be able to be aggregated as a small generator and sold into the market.

The arrangements set out above are preferable to the proposed automatic right to export. That is, a right to export electricity without any reference to the needs of, or

impact on, the network or other network users. This is primarily because in many cases augmentation of the network will be required to enable the unconstrained export of electricity to the network. This could impose a significant cost on all network users, especially if it is not paid by the connection applicant. This is unlikely to lead to efficient investment in embedded generation or the distribution network for the long term interests of consumers of electricity.

The issue of exporting electricity into distribution networks is also being considered in a number of other forums, including:

- The Standing Council on Energy and Resources (SCER) is currently developing guidelines for a consistent national approach to feed in tariffs. These guidelines may consider how different feed in tariff structures might be used to encourage owners of embedded generation to maximise the export of electricity at times when it is of most value to the market, especially if the feed in tariff is a net tariff.

- The Productivity Commission has suggested that existing feed in tariff arrangements be replaced with tariffs that reflect the varying value of power produced by embedded generation at different points in time. The Productivity Commission also suggested that arrangements be put in place to allow for payments from distribution businesses to embedded generation providers to reflect the network value of their generation capacity and output.[135]

- The AEMC Power of choice review also recommended the development of a national approach to feed in tariffs including the ability of time varying tariffs to encourage owners of embedded generation assets to maximise the export of electricity during peak demand periods.[136] This recommendation also enables generators to sell their electricity to parties other than their retailer.

Prior to the introduction of more flexible tariff arrangements, embedded generators have the option of registering with AEMO as a non-scheduled market generator and, subject to any network constraints, can elect to export any surplus electricity generated to the NEM wholesale electricity pool.

The Commission considers that in time, when more innovative and flexible tariff arrangements are developed and deployed in the NEM, that the economic incentives to export electricity to the grid will improve. This will lead to more embedded generators choosing to size their equipment to take advantage of the opportunities in providing electricity to the distribution network at times of peak demand where it is flexible to do so.

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135 Productivity Commission, *Electricity Network Regulatory Framework: Draft Report*, Melbourne, October 2012, p457.

136 AEMC 2012, *Power of choice review - giving consumers options in the way they use electricity*, Final Report, 30 November 2012, Sydney, p231.

6.4.3 System fault level limitations

System fault level limitations on the distribution network are often cited by embedded generator proponents as 'show stoppers' when planning a connection. Of particular importance in regard to these faults is the fault level headroom in a network, which is the prospective maximum current or power that will flow in a circuit that is subject to a fault.

At the time that the proponents submitted their rule change request to the AEMC, there were no rules requiring DNSPs to publish information on fault levels or network constraints. Therefore, the lack of this information was seen by the proponents as a key failing of Chapter 5. This is because when planning an embedded generation connection, being unaware of the fault level headroom and network constraints adjacent to the site can impact on the location of the generation unit within the site and/or viability of the project entirely.

However, with publication of the distribution network planning and expansion framework rules in October 2012, DNSPs now have an obligation to publish a distribution annual planning report. This report includes a description of any factors that may have a material impact on a network including among other things, fault levels, voltage levels, and the quality of supply to other network users. At the March workshop, the proponents and stakeholders stated that they expected that the new distribution annual planning report rule requirements would achieve the objective in the rule change request for constraint information to be published.[137]

Given that this aspect of the proponent's rule change request has already been managed under the NER, the draft rule determination will not investigate this issue further.

6.5 Conclusion

The Commission is satisfied that the arrangements in respect of the technical requirements for the connection of embedded generators set out in the draft rule will, or are likely to, better contribute to the achievement of the NEO than the proposed rule. The draft rule is likely to promote efficient investment in embedded generation and distribution networks in the long term interests of consumers of electricity through:

- introducing transparent obligations on DNSPs to publish a register of equipment compliant with its minimum technical plant requirements. This should facilitate efficient planning, acquisition and investment decisions by connection applicants and other relevant parties when operating in the NEM;

137 For further information see the final rule determination for the Distribution Network Planning and Expansion Framework at www.aemc.gov.au/electricity/rule-changes/completed/distribution-network-planning-and-expansion-framework.html.

- providing consistent and clearly defined obligations for DNSPs to provide connection applicants with the minimum technical requirements necessary around the point of connection to maintain system security and reliability of supply as part of the preliminary response to a connection enquiry (and to an extent, the information pack). This should provide certainty to connection applicants and promote efficient investment in embedded generation;

- assisting network users to understand how the location of connection points affects the capability of the network to accept generator exports, including the need for augmentation of the shared network, thereby promoting the efficient use of, and investment in, electricity services;

- introducing an independent expert appraisal into the dispute resolution process as a means of facilitating greater access to, and transparency of, information relating to the technical requirements to aid in a reduction in potential information asymmetry in the negotiation of connecting embedded generators.

7 Connection charges and the cost of network augmentation

This chapter sets out the Commission's views in relation to the connection charges and cost of augmentation of the distribution network, having regard to the views of the proponents and those of stakeholders as set out in submissions to the consultation paper. This chapter is structured as follows:

- section 7.1 summarises the provisions in the draft rule;
- section 7.2 outlines the current provisions under the NER relating to connection charges and the cost of augmentation of the distribution network to enable connection;
- section 7.3 describes the proposed treatment of connection costs and shared network augmentation costs and summarises stakeholder responses to the first round of consultation on this matter;
- section 7.4 sets out the Commission's assessment of the proposed rule in respect of connection charges and shared network augmentation; and
- based on the Commission's assessment in section 7.4, section 7.5 sets out the Commission's conclusions on this matter.

7.1 Overview of draft rule

The draft rule includes minor changes to Chapter 5 of the NER to address aspects of the charges for connection. The draft rule clarifies what is currently permissible under the NER: that DNSPs are able to charge connection applicants an enquiry fee. The enquiry fee payable with the detailed enquiry request should reflect the reasonable costs of the work to be carried out by the DNSP to prepare the detailed enquiry response. The draft rule also requires a DNSP to provide an itemised statement of connection charges as part of a connection offer.

A summary of the key recommendations in comparison with the current provisions and the rule change request is set out in the following table.

Table 7.1 Connection charges under the draft rule - comparison with existing provisions and the rule change request

Current NER provisions	Rule change request	Draft rule
Enquiry fee (see section 7.4.1)		
There are no provisions in the NER relating to a fee-for-service arrangement. Clause 5.3.3(c)(5) of the NER enables DNSPs to charge an application fee which is payable on lodgement of an application to connect.	Proposed to include an optional fee-for-service in the NER (this would be additional to any connection application fee) for DNSPs to recover costs incurred to aid in development of a connection application.	DNSPs would be able to charge an enquiry fee for requests from the connection applicant for a detailed enquiry response. DNSPs are still able to charge an application fee, but cannot charge for work completed as part of the enquiry stage.
Itemised statement of charges (see section 7.4.3)		
Clause 5A.E.2 requires an itemised statement of connection charges be provided by a DNSP to the applicant. There are no similar obligations in Chapter 5 of the NER.	Proposed to oblige DNSPs to include an itemised statement of connection charges in a connection offer.	DNSPs would be required to provide an itemised statement of connection charges with an offer to connect for connections processed through the Chapter 5 process.

7.2 Current provisions

Currently, Chapter 5 of the NER enables DNSPs to charge a connection applicant an application fee which is payable on lodgement of an application to connect. Clause 5.3.3(c)(5) states that the amount of this application fee should not be more than necessary to cover the reasonable costs of all work anticipated to arise from investigating the application to connect and preparing the associated offer to connect.

The application fee arises from clause 5.3.3(c), which specifies that written advice from the NSP to the connection applicant must include all further information that the connection applicant must prepare and obtain in conjunction with the NSP to enable the NSP to assess an application to connect. That is, this written advice must contain details of any application fee that the NSP may charge. However, this clause does not require the NSP to publish the application fee on its website.

In respect of the consultancy style fee-for-service arrangement in the proposed rule, there are no existing provisions in the NER relating to this type of service.

The current arrangements in the NER that relate to the itemised statement of connection charges outlined in the proposed rule are set out in Schedule 5.6. This schedule identifies the proposed terms and conditions that must be contained in a

connection agreement. In relation to those items outlined in the proposed rule, Schedule 5.6(b) relates to the metering arrangements, and Schedule 5.6(d) refers to connection service charges. While the NER is not explicit in how the DNSP provides this information to the connection applicant, the connection agreement should contain information of the sort in the proposed rule. The itemised statement of connection charges in the proposed rule is essentially the same as those contained in clause 5A.E.2 of Chapter 5A of the NER.[138]

At present, embedded generators are not exempt from paying for the cost of augmentation of the distribution network under the NER. This applies to connections under Chapter 5 and Chapter 5A of the NER. For example under clause 5.3.5(d) of the NER, a DNSP must assess an application to connect so as to maintain the levels of service and quality of supply to existing registered participants in accordance with the NER. That is, the DNSP must consult with AEMO and other registered participants with whom it has connection agreements when preparing an offer to connect. Where the DNSP believes, in its reasonable opinion, that compliance with the terms and conditions of those connection agreements will be affected, it must assess the connection application and determine:

- the technical requirements for the equipment to be connected;
- the extent and cost of augmentations and changes to all affected networks;
- any consequent change in network service charges; and
- any possible material effect of this new connection on the network power transfer capability including that of other networks.

The provisions relating to the cost of augmentation of the network are similar under Chapter 5A of the NER. Clause 5A.C.3 provides for a negotiation framework between a DNSP and a connection applicant. In assessing an application under clause 5A.C.3(a)(5), a DNSP must determine:

- the technical requirements for the proposed new connection or connection alteration;
- the extent and costs of any necessary augmentation of the distribution system;
- any consequent change in charges for distribution use of system services; and
- any possible material effect of the proposed new connection or connection alteration on the network power transfer capability of the distribution network to which the new connection or connection alteration is proposed to be made and any other distribution network that might be affected by the proposed new connection or connection alteration.

138 This clause obliges DNSPs to provide the connection applicant with a connection offer accompanied by a schedule containing an itemised statement of connection costs of the types set

This framework can be used where the connection service sought under Chapter 5A is neither a basic nor standard connection service. It may also be used where an applicant wishes to negotiate the terms and conditions associated with a basic or standard connection service. In either case, it has limited application for embedded generation for which no offerings exist.

Furthermore, Part K of Chapter 6 of the NER sets out the arrangements for prudential requirements, capital contributions and prepayments for any new assets for the connection of embedded generators and distribution customers. Clause 6.21.2 specifically sets out the obligations on DNSPs and embedded generators and distribution customers relating to these requirements for "any new assets installed as part of a new connection or modification to an existing connection, including any augmentation to the distribution network".

7.3 Proposed rule

The proposed rule sought to clarify the types of information that DNSPs provide to connection applicants in relation to the costs of connecting embedded generators to the distribution network. The proposed rule contained a number of clauses relating to connection charges and shared network augmentation, including obligations on DNSPs to:

- publish on their website information relating to:[139]
  - the fee applicable to connect to the network, including the fee to process the application to connect; and
  - the basis for calculating the connection charges;
- consider charging embedded generator proponents an optional fee-for-service additional to any connection application fee to aid in development of the connection application;[140]
- include an itemised statement of connection costs (in so far as relevant) in the offer to connect, including:[141]
  - standard connection charges;
  - meter type and cost;
  - cost of network extension;

out in the proposed rule.

139 Rule change request, p26.

140 ibid, p17.

141 ibid, p27.

- details of upstream augmentation required to provide the connection service and associated cost; and
- any other incidental costs and the basis for their calculation; and

- only charge embedded generator proponents the cost for shallow augmentation costs (extension assets) and exempt them from paying shared network augmentation.[142]

7.3.1 Proponents view

The proponents considered that the current connection process does not provide DNSPs with a strong incentive to collaborate in the development or improvement of a connection enquiry or application.[143] To address this, the proponents recommended the introduction of an option in the NER that would allow DNSPs to charge a connection applicant a reasonable fee to cover expenses directly and reasonably incurred by the DNSP in assessing the application and making an offer to connect.[144] As this fee for the consultancy type of services provided would be additional to any connection application fee, the proponents considered that the application fee "should be reduced to account for the improved alignment between the project and the DNSPs connection requirements".[145]

Furthermore, depending on the specific requirements of a connection, the proponents stated that a project proponent connecting to a distribution network may be required to contribute to costs to augment the shared network. The way in which these costs are determined may vary in accordance with provisions under a DNSP's revenue determination and any jurisdictional arrangements. The proponents considered that this method is inequitable as there is a "last in, worst dressed" approach.[146] That is, the connection applicant that requires the marginal augmentation is penalised by having to contribute to augmenting the shared network although the previous connections did not.

The rule change proponents proposed that embedded generators should not have to pay any shared network augmentation costs, without outlining how this was efficient or would otherwise meet the NEO.[147] The proponents also raised information asymmetry issues regarding overall transparency of how costs are determined. The rule change request suggested that connection offers should include an "itemised statement of connection costs".[148]

142 ibid, p28.
143 Rule change request, p17.
144 ibid.
145 ibid.
146 ibid, p22.
147 ibid, p16.
148 ibid, p27.

7.3.2 Stakeholder views - consultation paper

Connection charges

Objective of a fee-for-service

United Energy, SP AusNet and the CEC considered that there was no need for an explicit fee-for-service provision in the NER. These stakeholders noted that there are currently no restrictions on DNSPs from autonomously implementing such a process if they wished to provide paid consultancy type services.[149]

On the other hand, Jemena and ETSA considered the introduction of a fee-for-service in the NER would be useful.[150]

Aurora Energy and Endeavour Energy supported the concept of a fee-for-service, but did not support the concept of DNSPs taking on the role of electrical consultant during the connection process. These services are better obtained by non-registered embedded generation proponents elsewhere in the market.[151]

Other stakeholders supported the current process where the AER decides the classification of DNSP services.[152] The EEC also noted that as DNSPs are monopoly businesses, it is appropriate that the AER has an oversight role to determine if a fee-for-service was reasonable.[153]

Current provisions under the NER

The ENA and Energex noted that under current jurisdictional arrangements some DNSPs are able to charge a fee for processing connection applications. This includes small and medium embedded generation applications. These fees are currently classified as alternative control (quoted) services and the fee is determined in accordance with the quoted services formula determined by the AER.[154]

Furthermore, Ausgrid stated that the NSW distribution businesses are in the process of proposing an additional service to the AER that specifically relates to generator

149 United Energy, Consultation paper submission, p11; SP AusNet, Consultation paper submission, p3; CEC, Consultation paper submission, p8.

150 Jemena, Consultation paper submission, p9 , and ETSA Utilities, Consultation paper submission, p7.

151 Aurora Energy, Consultation paper submission, p2 , and Endeavour Energy, Consultation paper submission, p8.

152 Ergon Energy, Consultation paper submission, August 2012, p.12.

153 Energy Efficiency Council, Consultation paper submission, August 2012, p2.

154 Energy Networks Association, Consultation paper submission, August 2012, p28; and Energex, Consultation paper submission, August 2012, p14.

connections.[155] This would provide a clear mechanism for those DNSPs to recover the efficient costs of connection if approved by the AER.

Classification of fee-for-service

Stakeholders were in agreement that any process outlining a fee-for-service should be undertaken by the AER.[156] The ENA noted that the services provided by some DNSPs in assessing generator connection enquiries or applications are treated as a standard control service.[157] However, not all stakeholders considered this appropriate. For example, United Energy considered this service should be unclassified, while Jemena believed it should be classified as a negotiated service.[158] Ausgrid considered that a fee-for-service should be classified as a direct control service.[159]

Conversely, embedded generation proponents (for example, the City of Sydney and Wood and Grieve Engineering) stated that any fee should be on a cost recovery basis only. While this fee need not be approved by the AER, the NER should contain guidelines on how such a fee should be determined. This could be time-based or connection stage-based.[160] An alternative charging approach was suggested by the Department of Primary Industry, Victoria. It suggested that the fee-for-service could be a flat rate charged per MW of installed capacity for all connections up to 5MW that reflects the average cost to the distributor.[161]

Augmentation of the shared network

Wood and Grieves and the City of Sydney were opposed to embedded generators being charged network augmentation costs.[162] All remaining stakeholders that provided submissions (including both embedded generation proponents and DNSPs) considered that embedded generator proponents should not be exempt from network augmentation charges.[163] However, many of these stakeholders suggested that the

155 Ausgrid, Consultation paper submission, August 2012, pp. 23-24.

156 Ergon Energy, Consultation paper submission, August 2012, p12; and Total Environment Centre, Consultation paper submission, August 2012, p4.

157 Energy Networks Association, Consultation paper submission, August 2012, p29.

158 United Energy, Consultation paper submission, August 2012, p4; and Jemena, Consultation paper submission, August 2012, p11

159 Ausgrid, Consultation paper submission, August 2012, p24.

160 City of Sydney, Consultation paper submission, August 2012, pp 8-9; and Wood and Grieve Engineering, Consultation paper submission, August 2012, p5.

161 Department of Primary Industry Victoria, Consultation paper submission, p3.

162 Wood & Grieves Engineering, Consultation paper submission, August 2012, p6; and City of Sydney, Consultation paper submission, August 2012, p9.

163 Consultation paper submissions on this point included: DMITRE (p2); EEC (p10); United Energy (p2); SP AusNet (p3); Ergon Energy (p13); Energex (pp15-16); Private Generators (p2); ETSA Utilities (pp1-2); Green Building Council of Australia (p3); EnerNOC (p5); Endeavour Energy (p19); Ausgrid (p14); esaa (p2); ENA (p31); and the AER (p1).

NER could be amended to create a fairer allocation process. The work by the AER on its connection charge guidelines was noted.[164]

Stakeholders also noted that if embedded generators do not pay for the costs of augmentation to the network, those costs will be borne by all other consumers. Accordingly, embedded generators should generally be treated in a similar manner to all other connection applicants.[165]

The ENA expressed support for a rule change clarifying that the pricing principles under Chapter 5 should be consistent with pricing principles under Chapter 5A. The AER's final connection charges guidelines state that the connection charge for non-registered embedded generators will be calculated on the total cost of the works required to support both the generation and load components of the connection service.[166] This approach would treat all NEM jurisdictions equally even if they have not implemented the National Energy Customer Framework (NECF) arrangements.[167]Alinta Energy also noted that any network augmentation issues should also consider those solutions proposed in the AEMC's Transmission Frameworks Review.[168]

Itemised statement of charges

Stakeholder submissions reported a significant lack of clarity around the costs associated with connection.[169] In particular, stakeholders considered that an itemised statement of costs relating to connection charges, meter types and costs, system extension charges and network augmentation would be beneficial.[170] It would allow this information to be included in feasibility studies and in particular, budget preparation for feasibility scenario modelling purposes.

However, some DNSPs have stated that it would be difficult to publish a standard itemised statement of costs applicable to embedded generators for each type, size and location.[171] Furthermore, DNSPs stated that connection charges are regulated by the AER as quoted services, and therefore standard fees are not applicable. Instead, the application fees and connection costs are calculated specific to the individual embedded generator (using the AER approved formula and input rates detailed in the

164 Energy Networks Association, Consultation paper submission, p19.

165 DIMTRE, Consultation paper submission, August 2012, p2.

166 Energy Networks Association, Consultation paper submission, August 2012, p19.

167 Currently Tasmania, South Australia and the ACT have adopted the NECF provisions.

168 Alinta Energy, Consultation paper submission, August 2012, p. 2.

169 Energy Efficiency Council, Consultation paper submission, August 2012, p6.

170 City of Sydney, Consultation paper submission, August 2012, p3; and TRUenergy, Consultation paper submission, August 2012, p3.

171 United Energy, Consultation paper submission, p5; and Energex, Consultation paper submission, p7.

DNSP's Pricing Proposal for each regulatory year and Capital Contributions Policy if applicable).[172]

7.4 Commission's assessment

The Commission has analysed and assessed the policy issues arising from the rule change request for connection charges and shared network augmentation costs. An assessment of each issue is set out below.

7.4.1 Connection charges - enquiry fee

The proponents have noted that it can be difficult to negotiate with a monopoly that may have little incentive to facilitate timely connection of embedded generation. To address this, the proposed rule included a fee-for-service arrangement, which would relate to 'consultancy' type services.[173]

Consultancy services of the type envisaged by the proponent are currently outside of the scope of the NER. DNSPs are able to provide these services to connection applicants under commercial arrangements if they choose.[174]

The NER currently enables DNSPs to charge connection applicants an application fee under clause 5.3.3(c)(5), which is payable on lodgement of an application to connect.

Objective of an enquiry fee

As noted above, the objective of the proposed fee-for-service was to encourage DNSPs to attend to the connection enquiries and applications lodged by embedded generation proponents. An alternative is to allow a fee to be charged to recover the costs of an enquiry.

An enquiry fee could be charged at the time that the connection applicant submits its request for a detailed enquiry response to the DNSP. It is envisaged that the objective of an enquiry fee could be to allow a DNSP cover the reasonable initial investigations about connecting an embedded generator to the network up to the point of connection. The enquiry fee may recover the cost of undertaking network studies, for example, fault level calculations, and any potential impact to the distribution network protection requirements.

Classification of an enquiry fee

Stakeholders, notably DNSPs, have commented that the classification of the service (responding to a detailed enquiry) would be an important consideration in developing

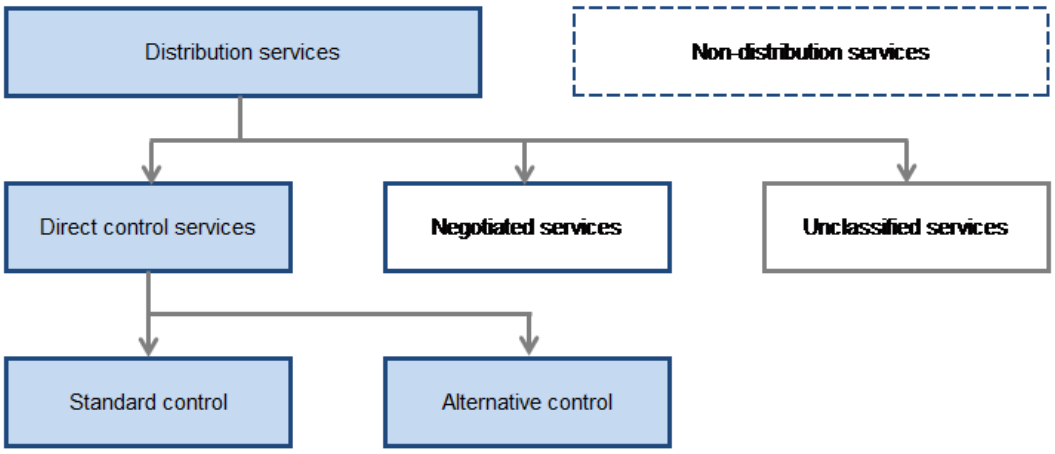
172 Energy Networks Association, Consultation paper submission, p28; Ergon Energy, Consultation paper submission, p6.

173 Rule change request, p17.

174 Private Generators, Consultation paper submission, p2.

and/or introducing an enquiry fee. As part of a distribution determination, the AER classifies various distribution services and decides the appropriate form of control to apply to those distribution services. The criteria that the AER uses to determine how services are classified are specified in the NER. A simplified overview of this classification is outlined in Figure 7.1 below.

Figure 7.1 Service classification of distribution services



Source: AEMC adapted from Australian Energy Regulator, *Matters relevant to the framework and approach for the ACT and NSW distribution network service providers 2014-2019*, December 2011, p4.

Those distribution services that fall within the direct control services classification are regulated by the AER and are included in the revenue determination process. Other services that are either negotiated or unclassified services fall outside of the regulatory oversight of the AER. An enquiry fee would be one of these services that falls outside of the oversight of the AER.

In the event that an enquiry fee was calculated to reflect the service classifications determined by the AER a high degree of prescription would need to be introduced to the NER. This prescription would be necessary to address the complexity involved in assessing each connection service in relation to its service classifications and assessing how those costs would be recovered. Any new provisions would also need to accommodate that service classifications can also change over time.

In addition, specifying the details about the charging of an enquiry fee would also need to consider:

- the various cost recovery arrangements specific to the enquiry fee services;
- whether some of the services related to the enquiry fee (undertaking network studies, for example, fault level calculations, and any potential impact to the distribution network protection requirements) are classified as entry connection services;
- that service classification, and consequently the cost recovery arrangements, may change over time; and

- that the scope of the work carries out to respond to a detailed enquiry response would vary, reflecting the specific circumstances of the embedded generation project (making the flat fee per MW less likely to reflect the reasonable costs incurred).

For these reasons, the Commission considers that the enquiry fee should be determined by DNSPs consistent with the existing provisions relating to the application fee.

Conclusion on enquiry fee

In summary, the NER currently allows DNSPs to charge an enquiry fee to potential connection applicants. The Commission is satisfied that to do so is reasonable and has not found any reason to remove this option. However, the draft rule does add some clarification about the charging of an enquiry fee.

As noted above, the purpose of the enquiry fee is to allow a DNSP to recover the reasonable costs incurred in the initial investigations for the connection of an embedded generator up to the point of connection. As such, these investigations would be specific to the enquiry being assessed by the DNSP and only cover the work required to prepare the detailed enquiry response for the connection applicant.

To facilitate this position, the draft rule includes provisions that acknowledge what is currently permissible under the NER: that DNSPs are able to charge connection applicants an enquiry fee. The draft rule also states that the amount of this enquiry fee should not be more than necessary to recover the reasonable costs of all work anticipated to arise from investigating and responding to a request for a detailed enquiry response.

The enquiry fee would be additional to any connection application fee that the DNSP may charge the connection applicant. The Commission notes comments by the proponents that with the introduction of an enquiry fee, the application fee "should be reduced to account for the improved alignment between the project and the DNSPs connection requirements".[175] However, the general principle is that fees and charges should be cost reflective. Consistent with this, and noted above, the fee payable with the detailed enquiry should reflect the reasonable costs of the work to be carried out by the DNSP to prepare the detailed enquiry response. The draft rule provides that the fee should not include any anticipation of work that may arise in the application process. Similarly, the application fee is to reflect the cost of carrying out the tasks associated with processing the connection application. Accordingly, to the extent that the DNSP undertakes more work upfront in assessing the detailed enquiry, the subsequent assessment of the connection application may require less analysis. Therefore, it is expected that the application fee would reflect the reduction in analysis required by the DNSP.

As these fees are project specific, the draft rule does not oblige DNSPs to publish a set of fees on their websites. However, under the draft rule, DNSPs will need to include

175 Rule change request, p17.

details of how components of the enquiry fee were calculated in the preliminary response and in worked examples in the information pack.

7.4.2 Augmentation costs associated with connection to the network

The rule change request sought to exempt connection applicants from paying the costs of any augmentation to the network that is required to facilitate the connection of embedded generation. The rule change request also sought to amend Chapter 5A so that the AER's connection charge guidelines are amended to be consistent with the proposal that embedded generation does not pay for network augmentation. In the proponents' opinion the current Chapter 5A provisions and AER connection charge guidelines are a departure from the current jurisdictional arrangements.

In considering this aspect of the rule change request, the key issues regarding the allocation of costs associated with augmentation of the network within the connection process are:

- whether embedded generators should contribute to the cost of augmentation to the network;
- addressing the 'last in, worst dressed' issue; and
- interaction with the RIT-D process.

Treatment of embedded generators and augmentation of the network

Defining shared network augmentation

The rule change request makes reference to the costs associated with connection and network augmentation. In particular, the term 'shared network augmentation' is often used in relation to the augmentation to the network necessary to facilitate connection of an embedded generator. It should be noted that this term is not defined in the NEL or the NER.[176]

For the purposes of this draft rule determination, the term shared network augmentation will refer to deep augmentation and is any augmentation of the distribution network beyond an embedded generators extension and connection assets.

176 Under the NEL, augmentation relates to work to enlarge the transmission or distribution system to increase its capacity to convey electricity. Shallow augmentation is usually defined by the energy industry as being the connection assets and extension assets up to and including the first transformation in the distribution system. Deep augmentation, or shared network augmentation is any augmentation of the distribution system other than shallow augmentation.

Shared network augmentation arrangements in Victoria

The proponents contend the connection charges with respect to embedded generators should be restricted to connection assets and extension costs and should not include shared network augmentation costs, consistent with the existing position in Victoria.

The legal requirements governing the connection of embedded generators in Victoria are contained within the Electricity Industry Guideline No. 15.[177] In addition, Electricity Industry Guideline No. 14 sets out the provision of services by DNSPs.[178] In particular, Guideline 14 details how the customer contribution to the capital cost of new works and augmentation is determined.

Therefore, to the extent that an embedded generator is both a generator and a customer, sections 3.2 and 3.3 of Guideline 14 allow DNSPs to recover a capital contribution for new works and augmentation. However, for embedded generators that are not customers, Guideline 15 does not allow the connection charge to include deep augmentation charges.[179]

These points with respect to the treatment of embedded generators in Victoria were noted by Jemena and United Energy.[180]

Notwithstanding, the Commission understands that these jurisdictional differences are likely to fall away with Victoria's implementation of the National Energy Customer Framework. The provisions under Chapter 5A of the NER will then be relevant.

Shared network augmentation in the NEM

The proponents and stakeholders have not raised any concern about embedded generators paying for shallow augmentation. This augmentation covers the extension assets between the generating plant and the point of connection to the distribution network and the connection assets required on the distribution network to provide connection services to the embedded generator. That is, embedded generators will pay for the full cost of those assets required on the customer side of the point of connection to connect to the distribution network.

However, the proponents have requested that embedded generators be exempt from paying for shared network augmentation because this augmentation may provide benefits to other network users, all of whom should share in the cost of augmentation.

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177 Essential Services Commission of Victoria, *Electricity Industry Guideline No. 15, Connection of Embedded Generation*, August 2004.

178 Essential Services Commission of Victoria, *Electricity Industry Guideline No. 14, Provision of services by electricity distributors*, April 2004.

179 Clause 3.3.2(b)(1)(B) of Guideline 15 states that "the use of system service charge may not include any amount referable to deep augmentation".

180 Jemena, Consultation paper submission, p12; and United Energy, Consultation paper submission, p12.

This request is in contrast to the underlying principle in the NEM that those who impose a burden on the network should contribute to the cost of any resulting necessary network augmentation. The amount to be paid should reflect the costs directly attributable to the user. That is, where a connection applicant requires shared network augmentation and the DNSP does not consider that the benefits of this augmentation will be shared with existing or new customers, the assets will generally be considered to be dedicated to that connection applicant and they will be requested to pay the full cost.

In situations where the DNSP considers that other network users will benefit from the shared network augmentation, it may elect to undertake and fund the investment itself. The costs would then be recovered from all network users. Alternatively, the DNSP may negotiate with the connection applicant to pay a capital contribution for its share of the cost of augmentation. The remainder of the investment would be recovered from all network users, as it would be part of the DNSP's general capital works program.

In general, any investment undertaken by a DNSP will become part of its regulatory asset base and earn a regulated rate of return. A DNSP will not earn a regulated rate of return on assets which are funded by directly customers or generators.

The current approach to attributing connection costs, particularly in relation to shared network augmentation, is approved by the AER as part of a DNSP's revenue determination. As noted in section 7.4.1 above, the classification of connection services varies between DNSPs.[181] How a DNSP calculates the costs of shared network augmentation will be based on the service classification for its connection services in the approved revenue determination for the relevant regulatory control period. To the extent that such services are classified as negotiated distribution services, the framework through which such services are negotiated is outlined under rule 6.7 of the NER.

This approach is applied to all connecting customers, whether load customers or generation customers.

If the current NER provisions were to be amended to exempt embedded generators from paying shared network augmentation, then the cost of connecting the embedded generator would be paid by other network users. The share of the cost burden between the embedded generator and other network users will depend on the relevant service classification and the details of the revenue determination. In some cases the burden may lie entirely with the other users of the network. This would dilute the cost-reflective price signals for a connection applicant. It also generates a cross-subsidy between different network users. The proposal to exempt embedded generators paying for shared network augmentation also ignores that this issue, through the determination process, is already subject to regulation by the AER.

181 Appendix B provides an overview of the classification of connection services by DNSP, including the treatment of shared network augmentation.

Further, the benefits of embedded generation may not be maximised if generators receive locational signals based only on the costs of shallow augmentation, because these signals may not account for a substantial part of the full connection costs. That is, the connection cost of generators connecting to the distribution system must include the impact of deep and shallow augmentation to support the efficient and optimal location of embedded generators.

The Commission considers that allocating costs to the party that benefit from the expenditure is likely to provide appropriate price signals for generators to locate efficiently and, is therefore desirable. To achieve efficient price signalling, customers should generally be charged the attributable costs that they impose on the network. Therefore, the draft rule does not include any provisions to allow embedded generators to be exempt for paying for shared network augmentation.

The Commission also considers that requiring embedded generators to contribute to shared network augmentation recognises that they are treated the same as large loads.

For these reasons, the draft rule does not make provision for the exemption of embedded generators paying shared network augmentation in either Chapter 5 or Chapter 5A.

Addressing the 'last-in, worst dressed'

The proponents considered that the current method for allocating shared network augmentation costs is inequitable as there is a 'last in, worst dressed' approach.[182] That is, the connection application that requires the marginal augmentation to occur is penalised by having to contribute to augmenting the shared network while the previous connections did not.

The NER currently provides an avenue through which DNSPs and connection applicants are able to manage this issue. One of the principles relating to access to negotiated distribution services (which govern the negotiated distribution services criteria set out in a regulatory determination) foreshadows the possibility of cost recovery. Specifically, clause 6.7.1(6) outlines that "the price for a negotiated distribution service should be subject to adjustment over time to the extent that the assets used to provide that service are subsequently used to provide services to another person, in which case the adjustment should reflect the extent to which the costs of that asset are being recovered through charges to that other person".

That is, the Commission considers that the NER already has provisions to manage the 'last in, worst dressed' issue. For example, where an embedded generator undertakes shared network augmentation (for instance, to improve fault level headroom in the distribution network) in respect of its connection to the distribution network, it may negotiate with the DNSP some term in its connection agreement relating to those assets

182 Rule change request, p22.

and any subsequent embedded generators connecting in the same location. These provisions are equally applicable to the connection of load customers.

In the absence of evidence to the contrary, the Commission considers that this aspect of the proponent's rule change request is adequately addressed under the NER. There is no need for the draft rule to make particular provision for it.

Interaction with the regulatory investment test for distribution

As noted above, there may be circumstances where a DNSP considers that the shared network augmentation required to connect an embedded generator would also benefit other network users, or new customers in the future. In this case, the DNSP may elect to fund the investment itself. In funding this investment, there is a risk that its costs may exceed the cost threshold for the regulatory investment test for distribution (RIT-D).[183]

The purpose of the RIT-D cost threshold is to balance the administrative burden on RIT-D proponents conducting the RIT-D process with the potential benefits. It achieves this by providing a dollar amount below which the RIT-D would not be applied. The RIT-D cost threshold is currently set at $5 million.

If the investment required to connect an embedded generator triggers the RIT-D process, this may necessitate an interruption to the connection process. Depending on the network and non-network options being considered by the DNSP, the RIT-D process may take up to 18 months to complete. In these circumstances, the DNSP and connection applicants would need to agree to halt the connection process to enable the DNSP to complete their assessment under the RIT-D.[184]

7.4.3 Itemised statement of costs

The proponents expressed concern about the transparency of how connection charges are determined and proposed that connection offers should include an 'itemised statement of connection costs'.[185] This itemised statement of costs is consistent with the obligation under clause 5A.E.2 of the NER. Clause 5A.E.2 obliges DNSPs to provide a connection applicant with a connection offer accompanied by a schedule containing an itemised statement of connection costs of the types set out in the proposed rule.

183 Triggering the RIT-D may also occur in other circumstances where the DNSP is to carry out capital expenditure. However, the risk is likely to be less.

184 For further information and discussion on the operation of the RIT-D process, see AEMC 2012, *Distribution Network Planning and Expansion Framework*, Rule Determination, 11 October 2012, Sydney.

185 Rule change request, p27.

In particular, the proposed rule specifies that the connection offer include information on:[186]

- standard connection charges;
- meter type and costs;
- cost of system extension;
- details of the upstream augmentation required to provide the connection service and associated cost; and
- any other incidental costs and the basis of their calculation.

The ENA noted that the NER already requires connection offers to include information on how distribution service charges have been calculated. Offers are also able to include a range of charges.[187]

Currently, clause 5.3.6(h), which is designated as a civil penalty provision, states that "an offer to connect must define the basis for determining distribution service charges in accordance with Chapter 6, including the prudential requirements set out in Part K of Chapter 6". Furthermore, Schedule 5.6 of the NER outlines the specific terms and conditions that a connection agreement must contain. These terms include, but are not limited to: metering arrangements; technical, commercial and legal conditions governing works required for the connection or extension to the network; payment conditions and connection service charges.

Accordingly, the NER does currently specify that an offer to connect is to contain the basis, and the terms and conditions, for determining distribution service charges. However, it does not specify how this information is presented to connection applicants.

Submissions from stakeholders have acknowledged that the provision of cost information in an itemised form would be beneficial to provide connection applicants with a greater understanding about their connection and the ultimate cost of connecting their embedded generator to the distribution network.[188]

Therefore, while specifying the provision of this information in the NER would reduce a DNSPs flexibility to offer a range of options or charges, it would provide connection applicants with a better, more accessible understanding of their connection to the distribution grid and what they are paying for.

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186 ibid.

187 Energy Networks Association, Consultation paper submission, p2.

188 TRUenergy, Consultation paper submission, p3; Alinta Energy, Consultation paper submission, p2; and United Energy, Consultation paper submission, p1&7.

Ausgrid and Endeavour Energy commented that jurisdictional differences may arise as a result of differences in the connection arrangements. Specifically, whether the construction of connection assets is contestable will impact on the connection information that can be provided. For example, any itemised statement of costs would only cover monopoly services.[189]

In response to these comments from various stakeholders, the draft rule includes an obligation on DNSPs to provide an itemised statement of charges, limited to the extent that they are relevant. That is, where there are contestable services, the DNSP would be obliged to inform the connection applicant that it may obtain its own quotes from suitably qualified accredited service providers for the provision of these particular services.

In sum, the provision of cost information, and the basis of the cost calculations to connection applicants as part of the connection offer would provide greater transparency in relation to the costs and charges necessary to connect embedded generation to distribution networks.

For this reason, the Commission has determined to oblige DNSPs to provide an itemised statement of charges as part of their connection offer to the extent practicable.

7.5 Conclusions

The Commission is satisfied that the arrangements in respect of connection charges and shared network augmentation set out in the draft rule will, or are likely to, better contribute to the achievement of the NEO than the proposed rule. The draft rule promotes efficient investment in embedded generation for the long term interests of consumers of electricity through:

- clarifying that DNSPs are able to charge an enquiry fee set at a level no more than necessary to cover the reasonable costs of all work to arise from investigating and responding to a detailed enquiry request (promoting transparency and clarifying the responsibilities of, and services to be provided by the DNSPs to connection applicants);

- requiring connection applicants to pay for shared network augmentation to ensure that embedded generators pay the full cost resulting from their connection to the distribution network. By avoiding the creation of cross-subsidies between users, the draft rule should promote efficient investment in, and efficient operation of, electricity services for the long term interests of consumers of electricity with respect to the price of supply of electricity; and

- the provision of an itemised statement of connection charges in the connection offer to provide greater transparency to connection applicants about the costs

189 Endeavour Energy, Consultation paper submission, p13; and Ausgrid, Consultation paper submission, p18.

and charges necessary to connect (facilitating efficient investment in embedded generators).

8 Implementation and transition

This chapter sets out the implementation and transition arrangements designed to facilitate the transition from existing arrangements to the new framework for connecting embedded generators. The Commission is mindful that participants and connecting applicants should not face unnecessary regulatory risks from changes to NER arrangements.

8.1 Implementation of the new arrangements

The draft rule modifies the current framework for the connection of embedded generators. These amendments will confer a number of obligations on DNSPs to improve the provision of information between connection applicants and DNSPs and facilitate more timely connections. The modifications to the NER outlined in the draft rule are as follows:

- **DNSPs to publish and maintain an information pack**: the information relevant to the making of an application to connect required to be published by a DNSP under clause 5.3A.3 must include: a description of the process for lodging an application to connect for an embedded generating unit; worked examples of connection service charges, enquiry and application fees for the connection of embedded generation units, based on a range of connections with varying technical characteristics; details of any minimum access standards or plant standards the DNSP considers is applicable to embedded generation units and generating plant; and standard form connection agreements used by the DNSP.

- **DNSPs to create and publish an enquiry form**: a form specifying the information the DNSP requires from the connection applicant for connection of an embedded generator.

- **DNSPs to publish and maintain a register of compliant equipment**: a register of embedded generating plant or associated equipment that the DNSP considers complies with its minimum access standards, or reasonable requirements in respect of design and technical requirements of plant or equipment connected to the network.

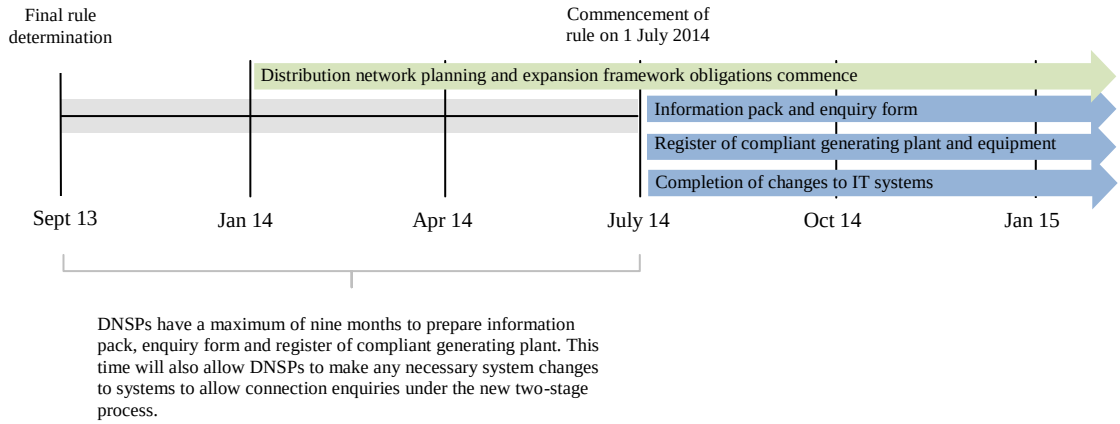
- **DNSPs to prepare for connection enquiries under the new framework**: DNSPs will need to update their IT and other systems to prepare for preliminary and detailed responses under the revised process for connecting embedded generators.

Under the current timetable, the final rule determination will be published on 19 September 2013 and the Commission has identified 1 July 2014 as a reasonable date for commencement of the final rule. The Commission considers that the resulting period of approximately nine months would provide DNSPs sufficient time to develop and

publish the relevant information and documents in accordance with the new provisions under the NER.[190]

A summary of the implementation timeframes is set out in Figure 8.1 below.

Figure 8.1 Implementation of amendments to the NER



8.2 Transition to the new arrangements

To transition to the new arrangements, the Commission considers that:

- if a person has made a connection enquiry under the current clause 5.3.2; where
  - the time under clause 5.3.2(c) has not elapsed, the connection enquiry should transition to the process under rule 5.3A; or
  - the time under clause 5.3.2(c) has elapsed, the connection enquiry should continue under old rule 5.3 unless the parties agree to re-start the connection enquiry under rule 5.3A;
- if a person has made an application to connect in accordance with the current clause 5.3.4, this application should be completed under rule 5.3 except that, if the embedded generator is less than 30 MW, then the offer to connect must contain an itemised statement of changes.

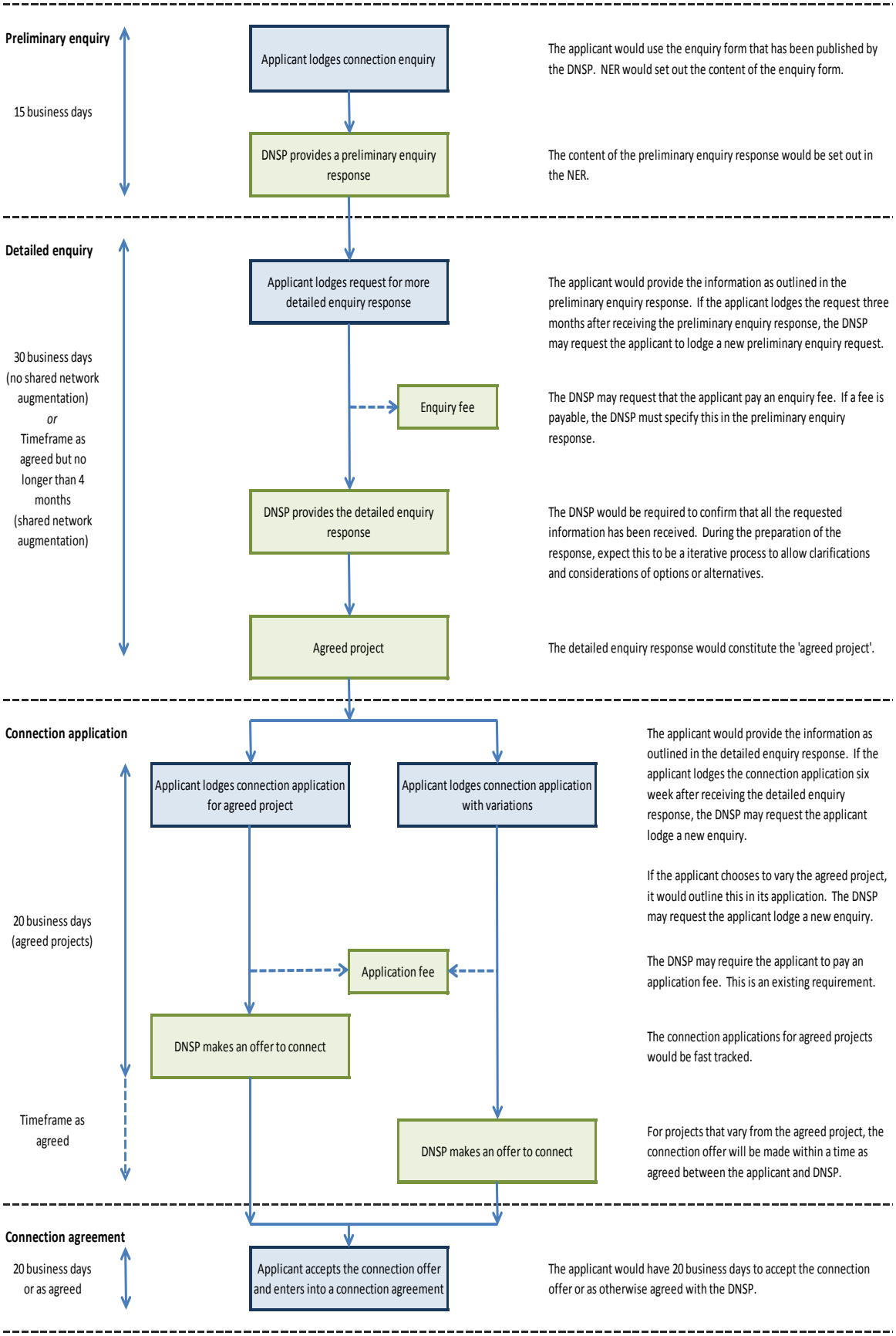
The Commission welcomes any additional information stakeholders consider relevant in relation to these transitional arrangements.

190 The Commission also notes that the Distribution Network Planning and Expansion Framework rule commences on 1 January 2014, which would address some of the implementation requirements arising from this rule.

Abbreviations

AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
DAPR	distribution annual planning report
DRET	Department of Resources, Energy and Tourism
GWh	gigawatt hour
kW	kilowatt
MCE	Ministerial Council on Energy
MVA	megavolt-ampere
MW	megawatt
NECF	National Energy Customer Framework
NEL	National Electricity Law
NEM	National Electricity Market
NEO	national electricity objective
NSP	network service provider
RIT-D	regulatory investment test for distribution
SCER	Standing Council on Energy and Resources
TFR	transmission frameworks review
TNSPs	transmission network service providers

A Connection process flow chart



B Service classification of connection services

A connection can be broadly separated into the following four separate connection services. The connection services are as follows:

1. **at the customer's connection point** - argumentation and/or installation of assets at the customer's connection point;

2. **extension** - an augmentation outside the existing network boundary that is required to facilitate the connection;

3. **augmentation** - any augmentation which is not an extension (including shared network argumentation); and

4. **design and administration** - services that include administration, design, certification and inspection.

As part of a distribution determination, the AER classifies distribution services and decides the appropriate form of control to apply to each distribution service. As noted above, shared network augmentation forms one of the connection services as part of a distribution determination.

In undertaking this process, each DNSP has a slightly different classification for these connection services. The following table provides an indication of how each connection service is classified for each DNSP in the NEM.

	Customer funded connections		Customer specific services	
	Activity description	**Classification**	**Activity description**	**Classification**
NSW service	Design and construction of new assets; design and construction of customer-funded network augmentations	Unregulated service	Services by the customer which includes: asset relocation works; conversion to aerial bundled cable; temporary, stand-by, reserve or duplicate supplies, other customer-requested services which are non-standard.	Unregulated service
ACT equivalent service	Customer initiated replacements and relocations	Standard control service	Miscellaneous services	Standard control service
Qld equivalent service	Design and construction of large customer connections	Alternative control service	Services provided on a quoted service basis	Alternative control service
Vic equivalent service	New connections requiring augmentation works	Standard control service	Services provided on a quoted service basis	Alternative control service
SA equivalent service	The provision of connection to the extent that a distribution network user is required to make a financial contribution in accordance with the Electricity Distribution Code.	Negotiated service	Non-standard and customer requested services	Negotiated services
Tas equivalent service	Where capital contributions are made by customers. That is, the customer contributes upfront to the cost of connection services.	Standard control service	Aurora provides a range of non-standard services on a quoted service basis.	Alternative control service

Australian Energy Regulator, *Matters relevant to the framework and approach for the ACT and NSW distribution network service providers 2014-2019*, December 2011, p13.

C Summary of submissions to the consultation paper

C.1 Submissions received

Alinta Energy

Alternative Technology Association (ATA)

APA Group

Arup Pty Ltd

Aurora Energy

Ausgrid

Australand

Australian Energy Regulator (AER)

CitiPower and Powercor Australia

Citipower and Powercor Australia (supplementary submission - August 2012)

City of Melbourne

City of Sydney

Clean Energy Council (CEC)

Department for Manufacturing, Innovation, Trade, Resources and Energy (DMITRE)

Department of Primary Industries, Victoria

Endeavour Energy

Energex

Energy Efficiency Council (EEC)

Energy Networks Association (ENA)

Energy Supply Association of Australia (esaa)

EnerNOC Pty Ltd

Ergon Energy

Essential Energy

ETSA Utilities

Green Building Council of Australia

Grid Australia

Honeywell Ltd

ISPT Pty Ltd

Jemena Electricity Networks (Vic) Ltd

Northern Alliance for Greenhouse Action

Origin Energy

Private Generators

Property Council of Australia (supplementary submission)

SP AusNet

Sustainable Regional Australia

Total Environment Centre (TEC)

Toyota Motor Corporation Australia Limited

TRUenergy

United Energy

Utilitas

Victorian Council of Social Service (VCOSS)

Wood & Grieve Engineers

WSP Buildings Pty Ltd

C.2 Summary of stakeholder responses

Stakeholder	Issue	AEMC response
Connection process		
Underlying problem/issues		
DMITRE (p4)	Considers that Chapter 5, combined with Chapter 5A, when introduced, will provide adequate regulation in place to ensure all embedded generators meet the requirements for connection to the distribution network. Also considers that ETSA Utilities' guides to embedded generation complements the regulation in the NER and specific jurisdictional requirements. Considers that if the AEMC feels the NER does not adequately provide the informational requirements, such a 'guide' should be considered for implementation in all jurisdictions as a means of providing the necessary information for process requirements.	The draft rule requires DNSPs to publish an 'information pack' which would include information to guide applicants on the connection requirements and set out relevant technical information and terms and conditions. These provisions are discussed further in section 5.2.1.
Australand (pp 1, 2), Honeywell (p1), ISPT Super Property (p2), Total Environment Centre (p3), Northern Alliance for Greenhouse Action (p1), City of Sydney (p1)	Considers there are a number of areas that present risks or barriers to connection, and can be improved upon. These include developing greater consistency between DNSPs; clarifying the connection costs and responsibilities for network augmentation; clearer processes and procedural documentation; provision of fault level information; clarification of times for connection.	A number of provisions under the draft rule go towards addressing these issues. These include the upfront information requirements under the 'information pack' and the two-stage enquiry process and amended application process. The draft rule sets out specific timeframes for providing responses and outlines the information to be provided by DNSPs at each stage of the enquiry process. See further discussions in sections 5.2.1. 5.2.2 and 5.2.3.
EEC (p1), Green Building Council Australia (p3), EnerNOC (pp 1-2), Wood &	Supports greater consistency in arrangements between DNSPs. Currently processes and requirements can vary between DNSPs and even within DNSPs. Need a standard, Australia-wide approach. Current processes can be ad-hoc,	The draft rule requires all DNSPs to publish an information pack and outlines an enquiry process that can be applied to all

Stakeholder	Issue	AEMC response
Grieve Engineers (p3), TRUenergy (p2)	which contributes to delays.	embedded generator connections. Setting out these requirements under the rules would promote increasing consistency between DNSPs.
Jemena (p7), United Energy (p3)	The connection process generally works well and is optimised when connection applicants are supported by a knowledgeable independent consultant who can effectively gather specific information on design and other matters reasonably required by a distributor.	Applicants are able to engage consultants to assist them with the connection process, which is outside the provisions of the NER. The Commission notes that, where appropriate consultants are engaged, the connection process may be completed efficiently.
Essential Energy (p1)	Historically the distribution networks in Australia have been designed for one-way flow of energy. This increases the importance of fully assessing and understanding the impacts and benefits of connecting embedded generation to the network. Therefore, it is important for customers and proponents associated with the installation of embedded generation to understand the diligence process that a DNSP is obliged to undertake. DNSPs must ensure that embedded generation does not adversely affect safety, power quality and reliability of the distribution network.	Maintaining the safety, power quality and reliability of the distribution network are important considerations. The two-stage enquiry process provides the preliminary stage where general, high level information may be exchanged. The detailed enquiry stage would allow for more thorough assessments of the connection requirements. Further information on the enquiry process is in sections 5.2.2 and 5.2.3.
Clean Energy Council (p1)	Agrees the connection process is often cumbersome and inefficient. The CEC's view is that many of the issues presented can be better managed with enhanced levels of information transparency. The CEC's firm view is that embedded generator connections can no longer be considered a practice to be undertaken in a bespoke fashion. They are rapidly becoming a day to day activity of DNSPs and the rules need to evolve urgently to maintain pace and remove the clear barriers presented by current practices.	The draft rule requires more information to be published up front by DNSPs to supplement the existing information requirements under the NER. Additional clarity as to the information that should be provided by the applicant and the DNSP at each stage of the connection process is also provided. It is noted that Chapter 5A allows for standard offerings to be

Stakeholder	Issue	AEMC response
		developed, which would streamline the connection process for those projects.
Clean Energy Council (p2)	The CEC's view is that more significant reform to the rules is required to unify the embedded generator connection process across DNSPs and subsequently derive efficiencies.	The Commission notes the CEC's comments. The draft rule introduces a number of changes to the existing connection enquiry and application requirements including different timeframes for DNSPs to respond.
Clean Energy Council (p7)	As noted by the Commission DNSPs have strong incentives to maintain their networks and weak incentives to connect generation efficiently (DMIS rule change). As a result this general approach does not facilitate efficient connection options, or enable the development of innovative and integrated connection solutions which meet all necessary technical standards. Therefore it cannot provide for efficient connections or enable the connection applicant to make informed and timely investment decisions.	The draft rule sets out the technical requirements applicable for each step of the enquiry and application process. These changes promote increased certainty and transparency, outlining and clarifying the connection applicants' and DNSPs' obligations. Further details on these provisions are outlined in Chapters 5 and 6.
ISPT Super Property (p1)	Embedded generation is a form of proven technology which can reduce the greenhouse gas emissions of a property. However, the unknown costs and regulatory risks related to this technology outweigh the return on investment we require for all capital expenditure feasibilities. The regulatory requirements make it difficult to enable the excess supply of electricity generated by this technology to be supplied back into the network. By removing the regulatory uncertainty and risk associated with regulatory costs, the technology and its implementation may become more attractive to building owners.	The Commission notes the comments. As outlined above, the draft rule introduces a number of changes including specific timeframes to clarify obligations of all parties and increase certainty and transparency.
VCOSS (p1)	Supports the rule change request. A streamlined connection regime based on a principle of facilitating access where practicable would likely both help slow growth in electricity prices over the medium term (by mitigating the cost impact of peak demand) and hasten the transition to a lower carbon economy. Additionally the proposed rule change would equally support community renewable energy	The draft rule enables a 'fast track' connection application process, where the DNSP is required to make a connection offer within 20 business days for 'agreed projects'. Further discussion is outlined in

Stakeholder	Issue	AEMC response
	(CRE) projects. CRE projects can provide a concrete way for lower income households, especially tenants, to benefit directly from renewable energy.	sections 5.2.3 and 5.2.4
City of Melbourne (p1)	Are anecdotally aware that the largest barriers preventing grid connected cogeneration systems from being installed are existing timeframes for approvals and the lack of certainty in the process when obtaining approvals from distribution utilities. Building owners and developers have identified long timeframes, uncertain costs and lack of clarity around technical requirements as significant barriers which have delayed projects or prevented them from proceeding.	As outlined above, the draft rule introduces specific timeframes for DNSPs to provide responses at each stage of the connection process. This includes a 20 business day 'fast track' option for 'agreed projects'. Other approvals for connection (for example, development applications) are outside the scope of the NER. Further discussion is outlined in sections 5.2.3 and 5.2.4.
ETSA Utilities (p1)	Believes that a well-documented connection process and clearly defined technical requirements may further encourage the uptake of embedded generation.	The Commission notes the comments. The draft rule outlines requirements for DNSPs to publish an information pack, which is to include information that would guide applicants on applying the connection provisions and technical information.
ETSA Utilities (p6)	Believes the underlying principle for this component of the rule change request is the concept of an 'informed customer'. That is a customer who understands not only the timeframes of the application process but also what information is reasonably required from them and the terms and conditions of any possible connection.	The information pack requirements, under the draft rule, promote transparency and allow applicants access to the relevant information. The two stage enquiry process also compels DNSPs to provide more explanation of the process and what is required for connection.
ETSA Utilities (p6)	Chapter 5A, specifically clause 5A.C.3(a)(3), requires DNSPs to provide information to the connection applicant that it reasonably requires in order to negotiate on an informed basis. Chapter 5A will also provide a streamlined connection process. As such, consider this component (on timeframes, standard information requirements and contract terms) of the rule change request is	The draft rule relates to the connection process under Chapter 5. The information requirements have flexibility in that the DNSPs can choose to implement the requirements in a way that is

Stakeholder	Issue	AEMC response
	superfluous.	complementary to their existing information requirements.
Infratil Energy Australia (p1)	Consider issues raised are systemic and unrelated to the particular characteristics of the local distribution network. This leads us to conclude that embedded generation connection is better dealt with from a regulatory perspective rather than allowing each DNSP to consider its own response, as would be the case under the proposals in the new Chapter 5A.	The Commission has taken into account this comment and other issues raised by stakeholders. The draft rule improves the clarity and transparency of the connection requirements and provides additional information to applicants to assist them throughout the connection process. Clearer obligations on timeframes would promote more time-efficient outcomes.
EnerNOC (p2)	To achieve an effective change need to ensure that decisions made by the networks about embedded generators are in line with the objectives set in the NEO and ensure that specific timelines are met and changes reflect efficient costs.	The Commission notes the comments. The draft rule introduces a number of new provisions relating to information provision and improving the connection process. The NEO analysis is set out in Chapter 2.
Alinta Energy (p1), Origin Energy (p1), esaa (p1), Alinta Energy (pp 1-2)	Notes that many of the issues covered have parallels in the connection experiences of large scale generation. Where improvements are made to the Chapter 5 process they should be available to all potential connecting applicants rather than changed to meet the needs of embedded generators. Notes that issues with large scale connection are being considered under the TFR.	The Commission notes that a number of connection issues were also considered under the TFR. The Commission has taken into account the over-arching principles in making this determination. The draft rule introduces a number of provisions specific to the connection of embedded generators to account for the requirements of these connection applicants. Additional discussion of these considerations are outlined throughout this determination and particularly in Chapter 3.
Ausgrid (covering letter)	Does not agree that there is a gap in the regulatory framework for connecting embedded generators. Note there have been a number of reviews undertaken in	The Commission notes the comments. Throughout consultation, stakeholders

Stakeholder	Issue	AEMC response
	recent times that have found the framework is appropriate and robust.	overwhelmingly noted that clarification of the process for embedded generators would aid overall transparency. Additional discussion of these considerations are outlined throughout this determination and particularly in Chapter 3.
Endeavour Energy (pp 3-4)	Pre-empting model standing offers for standard connection services under Chapter 5A by seeking amendments to the Chapter 5 connections process applying to large generation is both unnecessary and inappropriate. This is especially the case where the proponents offer no standards to be met by embedded generation, as currently applies to large generation in schedule 5.2. A better approach would be to require the establishment of Australian Standards for these non-registered embedded generators (similar to Schedule 5.2 of the NER) as a prerequisite for additional rules for connection of non-registered embedded generation. This would also provide the clear guidance sought by the non-registered embedded generators.	The Commission notes the comments. The appropriateness of establishing Australian Standards and the requirements for DNSPs to publish information on their technical requirements is discussed in detail in Chapter 6. The information pack provisions under the draft rule will provide additional guidance to applicants on the requirements for connection; this is discussed further in section 5.2.1
Utilitas (p1)	The Queensland Government has made substantial commitments to increase renewable energy generation capacity. However, in practice the processes, rules and regulations surrounding network access for embedded generators are rendering connection of distributed renewable generation unviable through the imposition of unreasonable delays and costs.	As discussed throughout Chapter 5, the draft rule provides for additional upfront information and clearer and more transparent enquiry and application processes.
Arup (p1)	Experience in Melbourne and Sydney note the following issues: — lack of clarity in the definition of embedded generation, particularly in relation to diesel rotary uninterruptible power supplies; — lack of published detail of the interface requirements; — equipment providers that have satisfied the requirements of network service providers elsewhere in the world may not have adequately transferred this knowledge and practices locally to the satisfaction of the local network	The requirements under the draft rule would provide more clarity to applicants and clarifies the obligations of the DNSPs. The information to be exchanged at each stage of the connection process has also been clarified. This includes specific references to applications that require shared network augmentation and the ability to complete connection enquiries that do not require shared network

Stakeholder	Issue	AEMC response
	providers; — process is variable and evolving; — in all cases, the network service provider was prepared to engage in an application process, however, the effectiveness of this engagement varied for each project; and — there has never been any discussion of sharing the benefits of deferred network augmentation which might result from an embedded generator.	augmentation more quickly.
Grid Australia (p3)	Acknowledges that information exchange between applicants and the relevant NSP is a key aspect of the connection enquiry process and one that is necessarily iterative. The level of information exchange and discussion may vary according to, for example, the complexity of the applicant's requirements, the potential site of connection to the network as well as the familiarity of the applicant with the connection process. As a result, does not consider that it would be appropriate to adopt a 'one-size-fits-all' or 'boiler plate' approach across all circumstances. In other words, flexibility should be retained to facilitate commercial realities.	The draft rule sets specific timeframes for actions to be completed but takes into account that some types of connections may require less time than others to process. The draft rule also requires DNSPs to publish an enquiry form, which provides some standardisation to the start of the enquiry process. However, the detailed enquiry stage and application stage allow the information requirements to be tailored to the specific needs of each application.
Ausgrid (covering letter)	Recognises there is value in having clear and published connection processes and documentation. However, noting industry reforms that appear likely to already address the proponents' concerns, believe time needs to be allowed in order for reform changes to be implemented and the impacts realised before further fundamental changes to the framework are made.	The Commission notes the comments made. The draft rule provides a number of changes in the information requirements as well as the connection process. Specific considerations are discussed through this determination.
Ausgrid (p4)	Large embedded generations connected to Ausgrid's network is very low but expected to grow in the future. Currently internal processes for connecting larger embedded generators are still being refined and further developed with the new	The Commission notes the comments made. The draft rule provides a connection process that embedded generators may

Stakeholder	Issue	AEMC response
	Chapter 5A in mind. Over time and with greater connection numbers, DNSPs will have improved understanding and confidence as to how these embedded generators behave. This in turn would allow for DNSPs to refine its internal processes and, where possible, further streamline processes and standardise technical requirements.	choose to follow; or alternatively embedded generators may choose to follow the connection process under Chapter 5A in relevant jurisdictions to the extent that may be relevant to that applicant. Over time, as DNSPs develop more standard offerings relevant to embedded generators, they may find the process under Chapter 5A to be more suitable.
Ausgrid (p4)	Notes the proponents' perceived issues seem to largely stem from a lack of transparency and clarity in processes, as well as a deficiency in communication between the DNSP and the embedded generator. Would be beneficial if there was further examination of these issues to determine whether they apply universally across the NEM. Further analysis should be undertaken to assess whether the introduction of chapter 5A will address the issues raised prior to commencing further round of rule changes.	The Commission notes the comments made. The draft rule takes into account the issues raised by stakeholders and seeks to improve clarity and transparency for connections of embedded generators under Chapter 5.
Ausgrid (p7)	Notes that the Federal Government's Energy White Paper proposed further assessment of the impacts of increased intermittent generation, particularly any consequent new requirements on the structure and operation of networks.	The comments are noted.
Ausgrid (p13)	Considers that it would be prudent to consider the regulatory approach that has been adopted for load customers and how, where appropriate, it can be applied and/or extended to generators. In this regard, the new Chapter 5A appears to be a useful starting point to consider non-registered generator connection contracts, processes and charging arrangements.	In preparing the draft rule the Commission has taken into account the existing provisions as they apply to all connection applicants. Where consistency is appropriate between different connecting parties, the Commission has sought to retain these provisions.
Sustainable Regional Australia (p1)	The proposed changes provide solutions to the varied barriers and disincentives that we are currently confronting in facilitating cogeneration projects and establishing community owned renewable energy assets. In particular, the	The Commission notes the comments made. As set out in Chapter 3, the draft rule seeks to address the issues raised by

Stakeholder	Issue	AEMC response
	proposed changes will: — positively enhance project viability through reduced connection fees and reduced technical requirements; and — increase incentives and success rates through systematic procedures that are streamlined, clear, transparent and consistent.	the proponents and other stakeholders.
APA Group (p2)	Fundamentally supportive of the rule change given that the proposed outcomes are for an increase in process efficiency that also reduces costs.	The comments are noted.
APA Group (p4)	Agrees with the proponents' on the barriers to entry for embedded generators. Considers the connection process needs to be easier, quicker, lower cost and easier to understand.	The comments are noted. The draft rule promotes the clarity and transparency of the connection process as well as improving the provisions for parties to exchange information during the connection application process. Additional discussion is outlined in Chapter 5.
esaa (p3)	While having a set of standard conditions would be useful for embedded generation proponents, this does not take into account the potential diversity of embedded generation. It is difficult for network service providers to offer a standard connection without knowing details such as the size of the system, the technical requirements of it, and where the system will be installed. That said, developing a standard process for establishing terms and conditions, fees and timing could reduce the time spent on negotiating on non-essential elements. This would provide more opportunity for embedded generators and network businesses to discuss the most critical issues. Fostering links between parties so that there is greater information sharing would be a better way to ensure that embedded generators are fully aware of the connection process.	The draft rule provides a two-stage enquiry process to allow sufficient information to be exchanged and analysis to be undertaken. Additional discussion is outlined in sections 5.2.2 and 5.2.3.
ENA (p1)	ENA members understand that project proponents, especially those without experience in the energy sector, can be frustrated by what they see as	The comments are noted. The draft rule clarifies the connection process

Stakeholder	Issue	AEMC response
	complicated connection processes. ENA members already provide substantial information to assist proponents. ENA members welcome some of the proposals in the rule change request which could help to clarify requirements or otherwise improve communication between networks and proponents.	requirements including the information that is to be exchanged through the connection process.
Wood & Grieve Engineers (p1)	Have experienced the following issues: — perceived lengthy application process; — not a fully defined information exchange process; — perceived lack of technical support; — costly application process with no certainty of outcome; — unknown upfront costs, which are important inputs for the feasibility stage financial modelling; and — if augmentation costs were required, some concern over whether these works would be completed by the power authority in time to suit the project.	The Commission notes the comments. The draft rule sets out specific timeframes within which connection enquiries and applications are to be completed. The information exchange requirements have also been clarified. Upfront information on technical information and examples of charges among other things will also be published by DNSPs. Each aspect of these changes is discussed in Chapters 5 and 6.
Current problems experienced		
EEC (p5)	Repeated requests for information caused by limited incentive for DNSPs to keep to a timetable; lack of experience within DNSPs; poor coordination and communication within DNSPs. This creates unacceptable and entirely avoidable delays that increase the cost of embedded generation projects and can make them unviable.	The Commission notes these comments. Among other changes, the draft rule specifies specific timeframes within which connection enquiries and applications need to be completed. Additional discussion is outlined in sections 5.2.2, 5.2.3 and 5.2.4.
ENA (p13), United Energy (p3)	A DNSP may have had, and likely will have a future need, to ask an applicant to clarify or explain information and material previously provided by the applicant. A request for resubmission could occur where the process is highly iterative and include changes in resources of both the DNSP and the applicant; changes in the	The Commission notes the comments. The draft rule clarified the connection process requirements and would be able to accommodate the iterative process that is

Stakeholder	Issue	AEMC response
	design or scope of works; requirement to confirm information provided. Where all the information is provided early in the process, the connection offer can be provided fairly quickly.	required for connections.
Endeavour Energy (p7)	To the extent that a cogeneration proponent is not equipped to provide sufficient information they may seek this information and expertise from the market. In NSW, a contestability regime ensures this service is available to connection applicants.	The Commission notes that the current framework does not preclude connection applicants from entering into commercial contracts with consultants or DNSPs for specialised services.
Energex (p5), ENA (p9)	Many applicants are not aware of the requirements and processes under Chapter 5 of the NER.	The draft rule requires information to be published upfront to assist connection applicants with understanding the connection requirements. Additional discussion is outlined in section 5.2.1.
SP AusNet (p2), Energex (p3)	Connections are unique and it would not be practical to have a one size fits all connection offer for embedded generators above a certain threshold.	The draft rule takes into account that not all connections are the same. The process allows connections that do not require shared network augmentation to be fast tracked during the enquiry stage and connection offers to be made for 'agreed projects' within 20 business days. Additional discussion is outlined in sections 5.2.2 and 5.2.3.
United Energy (p3)	Connection applicant needs to demonstrate how they comply with the access standards. Often connection applicants are seeking a firm connection offer when they are still tendering for the equipment. Timing issue which lends itself to a more iterative process, leading to considerable time between the connection applications being received and connection offer being made.	The draft rule provides the concept of the 'agreed project' where a connection offer would be based on specific parameters that have been agreed. The connection applicant may choose to change the parameters, however the DNSP could require a new enquiry to be lodged in order to consider any potential impacts.

Stakeholder	Issue	AEMC response
		Additional discussion on the connection application process is outlined in section 5.3.4.
Infratil Energy Australia (p2)	The connection enquiry process really serves little purpose - responses merely regurgitate the requirements of the NER and clarify the process; there is certainly not enough information provided to assist in assessing the viability of a connection. Nothing happens until the connection application has been submitted.	As outlined above the new enquiry process requires more work to be done upfront. Furthermore, the outcome of the enquiry process is an 'agreed project'. This provision provides an important outcome for the enquiry process as agreed projects will be fast tracked under the connection application process. Additional discussion on the connection application process is outlined in section 5.3.4.
ENA (p13), Energex (p8)	The connection process under 5.3 envisages that the first step in the connection process is a connection enquiry from the customer. However, this is rarely the first step. Generally the customer will first make contact with Energex with a pre-feasibility enquiry, providing relatively high-level details of potential connection options the customer is considering. In response to this, Energex provides initial information to the extent possible and requests that the customer provide a formal connection enquiry. Energex provides the customer a form for this purpose. A consultative engagement with the customer is required to resolve any issues.	The draft rule provides a preliminary enquiry step for higher level information to be exchanged. All enquiries are to be initiated through this step to provide clarity to the timeframes for actions to be completed and the information to be provided.
TRUenergy (p2), Australand (p1)	Currently too much time is spent communicating and understanding the varying connection requirements of DNSPs. This can be a very time consuming process and result in many uncertainties for the connection applicant. Increased availability of information upfront would minimise the time spend by developers in understanding the different requirements.	The information requirements under the draft rule will increase the amount of information that is available to applicants upfront and the information pack is a 'one off' obligation. It also clarifies the information to be exchanged throughout the connection process. See discussion in Chapter 5, particularly section 5.2.1.

Stakeholder	Issue	AEMC response
Origin Energy (p3)	There needs to be a careful balance between requiring too much or not enough information. At the moment, the current rules require - at times - a prohibitive quantum of information for embedded generation connections, which can greatly prolong the connection process.	As noted above, the draft rule increases the availability of upfront information that is generally applicable to all connection applicants. Information that builds on the upfront information and which is specific to each connection would then be provided throughout the connection process. See discussions in Chapter 5, particularly section 5.2.1.
Utilitas (p1)	Experiences mirror the concerns raised in the rule change request and demonstrate that these issues are also being experienced in other states such as Queensland, and in a non-urban context.	The Commission notes the comments. As discussed in Chapter 3, the draft rule takes into consideration the issues raised by the proponent and stakeholders.
Arup (pp 2-3)	Where there is a lack of detail provided by the equipment supplier and the availability of LNSP staff to review and understand the proposed technology has resulted in delays and resolution of technical issues. Over time, all LNSPs will have the experience to develop a range of connection request information sheets which will reflect the diverse range of potential projects.	The comments are noted.
Ausgrid (p3)	PV systems typically pose little risk to safety and network performance and DNSPs can confidently predict how these types of technology will behave. Other than PV installations though, there is limited data and experience with connecting embedded generators and how they will behave once integrated into the network. Consequently, the connection of these generators is currently dealt with on a case by case basis. Depending on the configuration of the local network, the configuration of the proponent's installation and how the proponent intends to operate the installation - additional studies, equipment and protection systems may be required for these units to be safely integrated into the network.	The comments are noted. The draft rule provides for additional time to consider connection applications that may require shared network augmentation and connection applications that are not based on agreed projects. See discussion in sections 5.2.3 and 5.2.4.
ENA (p13)	It is the experience of ENA members that where a connection applicant considers a request for certain information to be unreasonable, it has been subsequently	The comments are noted. The timeframes for completing enquiries and applications

Stakeholder	Issue	AEMC response
	resolved by an explanation of the need for the information in properly responding to the application in a timely manner.	under the draft rule provides time for DNSPs to liaise with connection applicants.
WSP Buildings Pty Ltd (p2)	It is their experience that the current negotiation/planning procedure implemented by Citipower also exacerbates [issues relating to an efficient connection process] due to the time taken to respond, requirement for upfront detailed information and lack of forthcoming information on the network capabilities.	The draft rule sets specific timeframes for responses during the connection process, requires DNSPs to publish an information pack to assist applicants, and the information pack is to include model connection agreements and technical information. Discussion is set out in section 5.2 and Chapter 6.
Toyota Motor Corporation Australia Limited (p2)	Have identified a number of issues and risks associated with embedded generation. Including a lack of clarity on the application of Chapter 5 to embedded generators; requiring clarity on roles and obligations as well as technical information, and requiring clearly defined timeframes for responses.	The comments are noted and the draft rule addresses these issues in a number of ways. Discussion on the amendments is outlined in section 5.2.
Consistency (Chapter 5/Chapter 5A/ jurisdictional standards)		
DMITRE (p 1, 3)	The connection of embedded generators is complex with systems varying in capacity, location and size, and each embedded generator places different requirement on a network. Accordingly the regulatory framework needs to provide for a broad range of connections.	The comments are noted. The draft rule provides a framework that takes into consideration the different requirements of connection applicants and DNSPs.
DMITRE (p3)	In the development of NECF, the MCE SCO considered the remainder of market participants and connection applicants (i.e. large load, and small and medium embedded generators) were diverse enough to warrant negotiating terms and conditions and connection requirements individually with the DNSP using a revised negotiating framework.	The comments are noted. The draft rule retains a negotiating framework.
United Energy (p1), SP AusNet (pp 1-2), Energex (p3)	Many of the rule changes proposed are seeking to add conditions already available in Chapter 5A to Chapter 5. Once NECF is adopted, there appears to be minimal benefit. Further has the potential to impact connections to the transmission system or large, complex registered generator connections. The	The comments are noted. The draft rule takes into account the problems identified with the existing provisions (as discussed in Chapter 3). Discussion on the provisions

Stakeholder	Issue	AEMC response
	Chapter 5A provisions are intended to be applicable to the class of generators relevant to the rule change request.	under Chapter 5 compared to Chapter 5A is outlined in section 5.2.5. To some extent, the amendments to clause 5.1.2(b) will have a broader affect than just allowing a person seeking to connect an embedded generator to the distribution network. However, it is unlikely to have an adverse effect on large scale connections.
CitiPower & Powercor (p4)	Consistent with the intent of Chapter 5, only large generators (around 30MW and above) have sought connection to the Businesses' distribution networks under Chapter 5 of the rules. All non-registered generators (less than 5MW) and generators between 5MW and 30MW have relied on the Victorian jurisdictional connection arrangements when seeking connections. Consider that the standard and information required for connection under Chapter 5 of the rules is entirely appropriate, however agree that further guidance could be provided to connections applicants to assist them in preparing their applications.	The comments are noted. The draft rule provides further guidance to connection applicants with requirements for the publication of upfront information and clarifying the obligations of parties involved in the connection process.
ENA (p8)	The connection process of Chapter 5 is usually not followed or chosen by customers as it is not particularly user-friendly and is aimed at customers who already have a deep understanding of their project and potential impacts. In one member's opinion, projects that are worked through in a collaborative approach between the DNSP and the proponent before any formal applications are made achieve the best outcomes.	The comments are noted. The draft rule provides greater clarity and transparency to the connection process than the existing arrangements and allows the current collaborative approach to continue.
ATA (p3)	In supporting the rule change, keen to ensure that any framework implemented to provide certainty over the process of grid connection for embedded generation remains technology agnostic. Wish to ensure that any future framework does not exclude generator types from achieving greater certainty in the grid connection process.	The comments are noted. The draft rule provides a connection process that applies for all types of embedded generation technologies.
Jemena (p3)	Considers that the current rules do not present any barriers to embedded generators from requiring a network service provider to comply with Chapter 5 but	The comments are noted. The draft rule clarifies the provisions as they apply to

Stakeholder	Issue	AEMC response
	has no issues with the proposed amendment that gives recognition of embedded generators' right in clause 5.3.2.	connecting applicants.
Ergon Energy (p3)	Agrees that it is not appropriate that embedded generators of this size contemplated by the rule change should sit under Chapter 5A. Rather they more appropriately sit under Chapter 5 of the NER. Given this, the definition of non-registered embedded generators should be removed from Chapter 5A.	The comments are noted. The draft rule provides a connection process under Chapter 5 that can be used by all embedded generators including those that are not registered.
Ergon Energy (p3)	Adopting the same connection principles used to develop Chapter 5A cannot and should not be transferred as an equivalent to Chapter 5.	The comments are noted. The draft rule amends the connection process under Chapter 5 and is based on the principles as discussed in Chapter 4.
Ergon Energy (p4)	Does not agree with giving embedded generators the right to require that NSPs comply with Chapter 5. This takes away the commercial right of both parties to negotiate the terms and conditions of a connection that should be available to both parties to negotiate terms and conditions of a connection that should be available to both parties.	The comments are noted. The Commission notes that currently any person can seek to agree a connection agreement under Chapter 5. The draft rule does not change this provision and includes provisions to clarify these arrangements.
TRUenergy (p2)	Chapter 5 appears to target larger scale generators connecting to the transmission and sub-transmission network. The process to connect embedded generators can be quicker and less prescriptive and the connection procedures under Chapter 5 fail to grasp this. Specifically, the problems for embedded generators in using the Chapter 5 procedures include the lack of clarity on technical data on generators and the lack of clear timeframes by which a DNSP should respond.	The comments are noted. The draft rule clarifies the obligations of connection applicants and DNSPs. Specific timeframes are also outlined for each step in the connection process. DNSPs will also be required to publish additional information including technical information.
Clean Energy Council (p2), Arup (p2)	Current arrangements for connection under Chapter 5 are well formed for the treatment of registered generators. However, Chapter 5 was never intended to fully manage the connection of non-registered generators, which are usually also embedded generators due to their location and capacity. The lack of detailed consideration of non-registered embedded generation in Chapter 5 means that	The comments are noted. As discussed throughout the draft determination, in making the draft rule, the Commission has taken these issues into consideration.

Stakeholder	Issue	AEMC response
	the process is difficult to translate directly to non-registered embedded generator connections. Clarity in acceptable connection requirements for 5MW to 30MW embedded generators needs to be established.	
Clean Energy Council (p3)	Believes that the current structure of Chapter 5 should be refined with the intent to connect registered generators or other registered participants, rather than expanded in scope to better manage non-registered embedded generation. The technical requirements for connection for non-registered embedded generation can be clearly distinguished from those prescribed for registered generators as intended by Chapter 5 and the rules should continue to recognise this. Although considers that proposed changes should focus on Chapter 5A but that Chapter 5A requires significant reform.	The comments are noted. The draft rule amends the connection process under Chapter 5. It is noted that non-registered embedded generators may elect to use either the Chapter 5 process or Chapter 5A process (if applicable for that jurisdiction).
Origin Energy (p1)	The NER connections framework needs to recognise there are differences between connecting large scale, micro and embedded generators to NEM networks. Separating the connection requirements for embedded generators from other large scale generation provides an opportunity for the AEMC to consider its broader reforms in the TFR parallel to this rule change. While broadly supports the rule change, are concerned by the broader implications of any amendments to Chapter 5. In particular, the AEMC needs to be conscious that amending the connections framework to address an embedded generation concern does not unintentionally give rise to a problem for large scale connections.	The comments are noted. As discussed throughout the draft determination, in making the draft rule, the Commission has taken these issues into consideration. To some extent, the amendments to clause 5.1.2(b) will have a broader affect than just allowing a person seeking to connect an embedded generator to the distribution network. However, it is unlikely to have an adverse effect on large scale connections.
Origin Energy (pp 2, 4)	Chapter 5 covers connections to the distribution and transmission networks; while Chapter 5A focuses on micro generation connection. Neither of these processes is equipped to support the timely connection of embedded generation. Considers the NER needs a connections framework that recognises the unique features of embedded generation connections. Supports filling the gap between Chapters 5 and 5A, it is important that any proposed amendments do not inadvertently impeded the connection process for large scale connections.	The comments are noted. As discussed throughout the draft determination, in making the draft rule, the Commission has taken these issues into consideration. The draft rule provides a connection process that is to be applied for embedded generators.

Stakeholder	Issue	AEMC response
Origin Energy (p3)	Under Chapter 5, AEMO is required to assess connection applications. However, embedded generators are less likely to have a 'whole-of-system' impact. This suggests assessment by AEMO is unnecessary. The connection process for these generators should therefore account for that reality.	DNSPs would only need to consult with AEMO to the extent that this is necessary for a connection application.
Aurora Energy (pp 1-2)	Observes that many of the proposals raised by the proponents are similar to aspects of the NECF. Given that the NECF has not been implemented in several jurisdictions, it would seem imprudent to counter jurisdictional policy by introducing analogous conditions through an alternative means.	The comments are noted. The draft rule amends the connection process under Chapter 5. The provisions under Chapter 5A are not impacted by this rule change.
Grid Australia (p2)	Considers the best way to ensure that the proponents' concerns are dealt with, and transmission connection arrangements are not inadvertently impacted, is for the embedded generation connection process to be contained to Chapter 5A of the rules.	The draft rule does not impact the transmission connection arrangements under Chapter 5.
City of Sydney (p1)	In order to alleviate the burden imposed by Chapter 5, the proposed amendment should provide for a standing exemption for generators below both the 5MW (exemption) and 30MW (registered exemptions) exempt limits. The practical effect of this exemption would enable small generators (below 30MW) not being required to comply with the onerous requirements imposed and intended for large generators (above 30MW).	The draft rule process may be used by non-registered embedded generators. The requirements for registration under the NER remain unchanged.
Level of prescription (clarify arrangements/certainty/flexibility)		
United Energy (p3)	Chapter 5 provides the minimum access standards and automatic access standards at a fairly high level, they are often not sufficient to provide meaningful guidance to a connection applicant.	The draft rule introduces provisions for DNSPs to publish additional information on technical requirements. Discussion is set out in section 5.3.2 and Chapter 6.
Ergon Energy (p3)	Supports enhancement of the connections framework that encourages the connection of EG but considers the focus should be on the identification of the different classes of EG connections rather than trying to standardise the connection process. The rule change should support this and therefore aim for	Consideration relating to the establishment of technical standards is set out in Chapter 6. Chapter 5A provides DNSPs with the ability to make standard offerings.

Stakeholder	Issue	AEMC response
	greater flexibility and less prescription.	
TRUenergy (p2)	Considers it is important that a connection enquiry submitted to a DNSP is acknowledged as received. DNSPs should also make clear the appropriate person to contact and communications should be clear to provide adequate information and explanations.	The draft rule includes requirements for DNSPs to acknowledge the receipt of enquiries and applications. Discussion is set out in sections 5.2.2, 5.2.3 and 5.2.4.
Clean Energy Council (p3)	Considers the connection process for non-registered embedded generators is under-prescribed. However, incremental changes of the nature proposed by the proponent will not necessarily result in the expected removal of barriers which currently exist to the entry of new non-registered embedded generation. Response times and content of all responses from DNSPs and information provided by connection applicants need to be prescribed in more detail.	The comments are noted. The draft rule sets out specific obligations in relation to each stage of the connection process.
Endeavour Energy (p3)	It is not reasonable for the proponents to expect that where a non-registered embedded generator elects not to each seek a connection under Chapter 5 of the NER (which applies in all participating jurisdictions), that each jurisdiction should alter their jurisdictional arrangements to provide identical alternative connection arrangements. This expectation fails to recognise that each jurisdiction has its own constitution and has developed its own jurisdictional specific connection regime (such as the contestability regime for connection services applying in NSW).	The draft rule includes a connection process for embedded generators, which does not prohibit jurisdictions from applying its own constitutions in implementing the process and information requirements.
Grid Australia (pp 3-4)	Notes that it is proposed to add a new clause which entrances a right on the part of embedded generators to require a DNSP to comply with Chapter 5. Notes that NSPs are already required to comply with Chapter 5 of the rules and therefore does not consider the rule change to be beneficial. However, in the event that the rule change is considered to have merit, Grid Australia notes that this could inappropriately include TNSPs. This clause should not apply verbatim to TNSPs.	The draft rule does not impact TNSPs except for the changes to clause 5.1.2. The amendments to clause 5.1.2(b) have a broader affect than just allowing a person seeking to connect an embedded generator to the distribution network. However, this is consistent with the existing nature of the clause, which was not limited to connection to a distribution network.

Stakeholder	Issue	AEMC response
Good faith		
EEC (p4), Clean Energy Council (p3), APA Group (p4)	Adding an additional good faith clause is highly unlikely to materially improve DNSP behaviour. The most important mechanism to ensure DNSPs act in good faith is to increase the power and pro-activity of the AER. Other clauses relating to the provision of information, technical standards or process timings should be sufficiently prescriptive.	The existing provisions under Chapter 5 have a number of 'good faith' provisions. The Commission did not consider any additional good faith provisions are required.
United Energy (pp 1, 4), CitiPower & Powercor (p4), Jemena (p4), Ergon Energy (p5), Endeavour Energy (p5), Ausgrid (p16), ENA (p10)	Considers the current good faith provisions in the regulatory framework are sufficient. Does not envisage any impact (or perceived improvement) by adding the additional principles. Good faith is also implied in commercial contracts and as such the proposed amendments are not required.	The comments are noted.
Energex (p6)	Energex always negotiate in good faith. Notes that the proponents have not provided any evidence that would suggest DNSPs do not negotiate in good faith. The proposed amendment would not impact Energex.	The comments are noted.
Infratil Energy Australia (p2)	Good faith negotiations assume that both parties wish to arrive at a successful transaction. As noted above, while one party would prefer not to be negotiating at all then the concept of good faith is lost. Good faith negotiations also require some balance of power which is clearly not the case when confronting a monopoly provider.	The Commission considers that the provisions under the draft rule provide better information to connecting parties, allowing them to negotiate in a more informed manner which may help address the issue of asymmetric power in negotiation.
Arup (p2)	Our experience in discussing network connections have generally be undertaken in good faith by the local NSPs. Perception is that some of the technical issues requiring resolution have not been encountered previously by the network and hence there is an element of "learning on the job". This approach can produce acceptable technical solutions, but can introduce time and cost penalties to the embedded generator proponent.	The comments are noted.

Stakeholder	Issue	AEMC response
Grid Australia (p4)	Both the NSP and the connection applicant are entitled to negotiate with each other in respect of the provision of connection and any other matters relevant to the provision of connection and, if negotiations occur, the NSP and the connection applicant must conduct such negotiations in good faith.	The comments are noted.
Transparency (including availability of information)		
DMITRE (p1)	[I]n South Australia, process and technical requirements are referenced in a customer guide (for connection of embedded generators) issued by the distribution network service provider, ETSA Utilities. As the guide is published online, embedded generation project proponents are able to consider these aspects as part of their design considerations.	The comments are noted. The draft rule introduces provisions that require DNSPs to publish additional information on the connection requirements. Discussion is outlined in section 5.2.1 and also in Chapter 6 in relation to technical information.
EEC (pp 4, 5), TRUenergy (p2), Clean Energy Council (p4), Infratil Energy Australia (p2), Arup (p2), Sustainable Regional Australia (p2)	Information asymmetry is the greatest barrier to embedded generation developments. Any proposal to enhance access to information by connection applicants will bring material benefits. Requiring DNSPs to publish information on the connection process will increase transparency and simplify assessment of whether a DNSP's process is reasonable and equitable. Very few parties are aware of their rights to apply Chapter 5. Creating clear, explicit statement of rights for distributed generators would not have negative impacts. However outcome could be better addressed through a national 'plain English' guide on embedded generation in the NEM. Greater value would be provided where this requirement to publish information is consistent across DNSPs.	The comments are noted. The draft rule introduces provisions that require DNSPs to publish additional information on the connection requirements. Discussion is outlined in section 5.2.1 and also in Chapter 6 in relation to technical information.
United Energy (p5)	Supportive of improved connection process information being available on websites; however does not envisage that there is a one size fits all approach given that the network standards are different in Victoria compared to other states and there may be different jurisdictional regulatory requirements.	The requirements for DNSPs to publish information under the draft rule provide flexibility for DNSPs to implement these requirements in a manner that is suitable for each of their businesses and jurisdictions.

Stakeholder	Issue	AEMC response
CitiPower & Powercor (pp 4-5)	Do not oppose a rule amendment to require DNSPs to prepare, publish information relating to the connection process including application form, application fees as well as other information reasonably required to facilitate connection to the distributor's network. However, does not support a 'one size fits all' approach to information requirements as DNSPs need to have regard to technical and other jurisdictional specific requirements.	The comments are noted. The draft rule allows DNSPs to develop information packs that reflect any specific technical and jurisdictional requirements that may be applicable.
CitiPower & Powercor (p5)	In connection offers made under Chapter 5 of the rules, the businesses provide a detail break-down of the connection charge. Do not oppose a rule to Chapter 5 to require DNSPs to provide an itemised statement of connection costs including information on connection charges, meter type and cost, cost of system extension, details of upstream augmentation and any other incidental costs. Chapter 5A already requires DNSPs to provide a breakdown of the connection charge, therefore the proposed amendment should only apply to Chapter 5 of the rules.	The comments are noted. The draft rule requires DNSPs to provide an itemised statement of charges in their connection offers.
ATA (p2)	The rule change is a critical step in providing full, transparent and timely information to the market regarding opportunities for potential investment decisions in particular to meet network constraints and peak demand; and a regulatory structure that ensures that the total benefits of any demand side activity at all levels of the supply chain are captured and monetised. Required for development of full competition.	The comments are noted. The draft rule requires DNSPs to publish an information pack, which supplements provisions under the demand side engagement document and distribution annual planning reports. Discussion is outlined in section 5.2.1.
Jemena (p4)	Considers publication of connection processes and application forms for embedded generators would benefit connection applicants. Costs will be required although may not be significant. However considers that the demand side engagement document provision addresses the requirement to publish the connection process for embedded generators.	The comments are noted. The draft rule requires DNSPs to publish an enquiry form, which is to be used by applicants at the start of the connection process. The draft rule takes into account the demand side engagement document and introduces additional information requirements that builds on that provision. DNSPs will have the option to implement these new information requirements as a part of the

Stakeholder	Issue	AEMC response
		demand side engagement document. Discussion is outlined in section 5.2.2.
ENA (p11), Energex (p6)	Application forms for a new connection necessarily vary depending on whether the connection is for export, import, and on the size of the connection. Publishing a single application form may give the connection applicant a false impression that there is a 'one-size-fits-all' connection process.	The comments are noted. The draft rule requires DNSPs to publish an enquiry form. As this form would be used at the start of the enquiry process, any specific project requirements would be identified throughout the connection process and may then be accurately captured in the detailed enquiry and connection application stages.
Essential Energy (p3)	Believes that it does have scope to improve the outcomes with a greater focus on consultation at the enquiry stage. This could be achieved through a 'preliminary enquiry' step which initiates discussion to allow the proponent to gain a full understanding of the network characteristics and performance requirements at the indicated point of connection and the DNSP to confirm the aims of the proponent. This would lead to an 'agreed project' which both the proponent and the DNSP consider would meet the generation objectives and network performance needs, and which would become the subject of the formal enquiry/application and response procedure generally as per Chapter 5 of the NER.	The comments are noted. The draft rule provides a preliminary enquiry stage as the first stage in the connection process. Discussion is outlined in section 5.2.2.
Essential Energy (p3)	The amended procedure incorporating the agreed projects concept could in essence meet the aims of the rule change proposal. Agreed projects with relatively straight forward connection requirements and acceptable network impacts could be progressed with minimal concern and conditions. More complex proposals would be subject to more detailed investigation and agreement. Believes this process is used informally now and has assisted the connection completion. The benefits could be extended by its formal consideration and inclusion in the connection process.	The comments are noted. The draft rule provides that the project that is outlined in a DNSP's detailed enquiry response would constitute an agreed project. Discussion is outlined in sections 5.2.3 and 5.2.4.

Stakeholder	Issue	AEMC response
Private Generators (p1)	In principle where the proposed rule change seeks to improve transparency, timeliness of connection, certainty and broadly improve access for new entrants - and where the provisions are not already included in the Rules - the Private Generators are supportive of the rules being changed to deliver on these objectives.	The comments are noted. The draft rule introduces a number of changes to provide greater clarity and transparency.
Infratil Energy Australia (p3)	The required scope of work and associated costs provided in offers to connect have been very clear in our experience. However, it is not observable whether the scope is excessive, how the costs were arrived at and whether either is reasonable.	The comments are noted. The draft rule requires DNSPs to publish upfront example costs and model connection agreements. This would be in addition to the existing provisions under the demand side engagement document, which required DNSPs to publish information explaining how charges are calculated.
Ausgrid (p13), ENA (pp 10-11)	Does not support the requirements to publish information under the rule change on the basis that it will likely duplicate reporting obligations. In our view capacity information can be derived from the Electricity System Development Review and the DAPR proposed.	The draft rule introduces requirements for new information to be published by DNSPs, including technical information. DNSPs can determine how best to implement these requirements.
APA Group (p4), Alinta Energy (p2), City of Sydney (pp 2-3), Wood & Grieve Engineers (p3)	Supports making information available to embedded generators including information about, network plans; demand side opportunities; and network performance and constraints. Usefulness will depend on how generic the information is. Current deficiencies in information provision have resulted in protracted holding times.	The draft rule introduces requirements for new information to be published by DNSPs, including technical information.
ENA (p10)	Agrees that improved communication leading to more efficient and effective connection processes should be the primary objective to improving the current arrangements. Therefore support a rule change that seeks to improve the connection process information requirements on DNSPs and the information required by connection applicants.	The comments are noted. The draft rule clarifies the information that is to be exchanged between parties. Discussion in outlined in sections 5.2.2, 5.2.3 and 5.2.4.

Stakeholder	Issue	AEMC response
Department of Primary Industries (Victoria) (p1)	Supports the publication of information on the connection process by network service providers but notes the overlap with the distribution network planning and expansion framework.	The comments are noted. The information requirements under the draft rule build upon and supplement those introduced under the distribution network planning and expansion framework. The draft rule provides for the overlap between DNSP's obligations in relation to distribution network planning and expansion framework and those in the draft rule. Discussion is set out in section 5.2.1.
Currently available information		
Essential Energy (p2), ETSA Utilities (p4), Energex (p6), Ergon Energy (pp 5-6), CitiPower & Powercor (p4), SP AusNet (p2), United Energy (p5)	DNSPs acknowledge that proponents require both network and generation installation information to develop a generation connection proposal which will meet both the proponent and network requirements and obligations. This is reflected in the development and publication of guideline and network connection procedure documents that are now provided by the ENA and a number of individual DNSPs. Information is available on both the connection process and technical requirements. This includes information as required under Chapter 5, and under Chapter 5A in the relevant jurisdictions.	The comments are noted and were taken into consideration in preparing the draft rule.
ENA (p1)	ENA is working on improving the information available to proponents. In 2011, ENA commissioned a major research project from the CSIRO, subsequently released as the Report on Impacts and Benefits of Embedded Generation in Australian Electricity Distribution Networks. ENA has released the ENA Guideline for the preparation of documentation for connection of Embedded Generation within Distribution Networks, May 2011.	The comments are noted and were taken into consideration in preparing the draft rule.
Overall timeframe		
EEC (p7)	Timeframes for offers to connect vary between DNSPs and within DNSPs. Can be provided in two months but can take up to two years. No clear factors affecting	The draft rule introduces specific timeframes for the enquiry and application

Stakeholder	Issue	AEMC response
	timeframes. Which DNSPs involved appears to be the most significant determining factor. Both feasible and necessary to include a specific timeframe to finalise an offer to connect.	processes. Discussion is outlined in section 5.2.
United Energy (p2), Jemena (p6)	Believe it is feasible to include a specific timeframe for completing the connection process subject to being able to vary the preliminary program to ensure that a more appropriate, informed connection offer is able to be made.	The comments are noted. The draft rule introduces specific timeframes for the enquiry and application processes. Time awaiting responses from external parties such as TNSPs and AEMO will not be counted towards the time limit. Discussion is outlined in section 5.2.
United Energy (p7), CitiPower & Powercor (p5)	A variety of factors may affect the timeline in the preliminary program including quality and completeness of information received; need to consult with other parties; time to agree on options, where there are alternatives, and access standards; and may need to consult with AEMO. Other parties to be consulted with are not bound by timeframes. As a matter of practicality, connection process is often iterative process. No objections to proposed 5.3.3.(b)(6) subject to the ability to vary the preliminary program to ensure a more appropriate, informed connection offer is able to be made.	The draft rule introduces timeframes for each stage of the connection process. DNSPs will have flexibility to manage the relevant consultations within these timeframes. Time awaiting responses from external parties such as TNSPs and AEMO will not be counted towards the time limit. Discussion is outlined in section 5.2.
United Energy (p8), Jemena (p7)	Offer to connect will be impacted by level of engagement, experience, workload and knowledge of applicant (or its consultants); completeness and quality of information provided upfront; complexity of the connection. While equipment is still being tendered and has not yet been selected by the connection applicant or where there is redesign, review of the updated reports would be required. A knowledgeable consultant significantly speeds up the process.	The comments are noted. The draft rule provides a preliminary enquiry stage and requirements for DNSPs to publish information. These provisions are intended to assist applicants to allow them to participate on an informed basis.
Ergon Energy (p8)	The need to undertake detailed and more complex connection design work, including where the applications involves non-standard Ergon Energy design; planning and technical studies; site visits and inspections, can affect the timeframe for finalising an offer to connect. Other factors can include determination of the classification of the service; dependency on external parties;	The comments are noted. The draft rule takes into account that some connections can be more complex. For this reason, DNSPs have a longer timeframe to complete detailed enquiries for connections that are likely to require shared network

Stakeholder	Issue	AEMC response
	third party approvals.	augmentation. Time awaiting responses from external parties is also excluded from the timeframe limits. Discussion is outlined in section 5.2.3.
Energex (p9)	Timeframes will vary depending on the complexity of the connection and the information made available on the connection applicant. For example a customer may request departures from terms and conditions or change their connection requirements during the course of negotiations. Factors that affect the overall timeframe between the initial enquiry and the offer to connect include the size of the proposed generator/load; the location of the generator/load; the customer's familiarity with the requirements of the rules and other electricity legislation; volume of applications being considered concurrently. Given these varying factors, it is not feasible to include a specific timeframe in the offer to connect. May be feasible to include an indicative timeframe.	The draft rule provides a 20 business day timeframe for connection offers to be made for 'agreed projects'. The draft rule allows the DNSP to agree an appropriate timeframe with the applicant if the connection application was for a project that had not been 'agreed'. Discussion is outlined in section 5.2.4.
TRUenergy (p3)	Is in favour of specifying a timeframe to finalise the offer to connect in the preliminary program. If factors arise that prevent the DNSP from adhering to this timeframe, the DNSP should clearly communicate these reasons, the action needed to be taken by whom to overcome these obstacle(s) and an indicative period of delay to the developer. The DNSP should take steps to minimise delays and keep the developer informed of the status of their connection application. Factors that typically cause delays to the timely processing of connection applications are the lack of complete and accurate information on the generator, site, end customer, etc sent to the DNSP.	The comments are noted.
Clean Energy Council (p5)	The current arrangements for a preliminary program are insufficient. Delays in the connection process create significant costs for generation proponents to the extent that they can be detrimental to the project. Many factors affect the connection enquiry. The expectation that a DNSP or a TNSP can estimate and be held to a detailed preliminary program in the response to the connection inquiry is unreasonable. For this reason many DNSPs and TNSPs will usually respond to this requirement with a simple estimate of the number of months expected to	The comments are noted. The draft rule introduces specific timeframes for each stage of the connection application process. Discussion is outlined in section 5.2.

Stakeholder	Issue	AEMC response
	provide the offer.	
Infratil Energy Australia (p3)	In our experience, an offer to connect is made 6 - 9 months following a formal application. Time affected by carrying out engineering reports to determine performance standards and, where applicable, negotiating access standards are critical factors. Also tactically delaying the provision of a draft connection agreement as noted above.	The comments are noted. The draft rule introduces specific timeframes for each stage of the connection application process. Discussion is outlined in section 5.2.
Origin Energy (pp 2-3)	Reducing the complexity of the connections process is critical to reducing the time of the connection process. Some of this complexity arises due to the level of discretion provided to the NSP in determining the applicable information and technical requirements.	The comments are noted. The draft rule introduces provisions that require DNSPs to publish relevant technical requirements and plant standards. Discussion is outlined in Chapter 6.
Origin Energy (p3)	Important for DNSPs to have access to sufficient information to meet its statutory obligations to maintain safe, secure and reliable supply of electricity. As an example, imposing a strict time period for processing connection applications may restrict the due consideration of technical requirements, particularly those relating to the quality of transfer capability.	The comments are noted. The draft rule clarifies the requirements for parties to exchange information. The draft rule also sets specific timeframes for each stage of the connection process but these times are subject to whether there is shared network augmentation and whether a project had been 'agreed'. Discussion is outlined in section 5.2.
Endeavour Energy (p11)	Notes that DNSPs may need to consult with other parties [such as TNSPs and other customers] during the connection process and that these other parties are not bound by timeframes. Any specific timeframe to apply must be based on having received a properly completed connection application and the provision of sufficient information by the connection applicant to properly assess the connection.	The draft rule provides specific timeframes that are to be met by DNSPs. DNSPs will be required to manage the relevant consultations within these periods. The process takes into account that connections which may require shared network augmentation can be more complex and, as such, a longer timeframe is provided to address these enquiries.

Stakeholder	Issue	AEMC response
Arup (p3)	To alleviate potential problems, the embedded generator proponent needs to engage with the LNSP as early as possible, without generating frivolous inquiries, once the proponent has sufficient information to provide the initial data for the LNSP.	The comments are noted.
Ausgrid (pp 3-4)	If there are no network complications anticipated from the connection, the planning and investigation; the offer to connect can be completed within 3 months. The timeframes for completion of the design and build phase for these connections are largely dependent upon the ASP engaged by the applicant.	The comments are noted.
Ausgrid (p5)	Ausgrid also seeks to actively engage with the applicant throughout the connection process. In particular, we encourage early engagement as much as possible in the planning and investigation phase in order to assist the applicant in determining whether there are any network constraints and the feasibility of their generator proposal. By regularly consulting with the applicant throughout the connection process, Ausgrid seeks to minimise costs to the applicant and unnecessary delays caused by confusion. This is also vital in managing the applicant's expectations, particularly around timeframes and costs.	The comments are noted.
Ausgrid (p5), ENA (p15)	It is also important to note that in regards to application timeframes, delays may occur which are beyond the control of the DNSP. For instance, if an applicant does not provide Ausgrid with the necessary information to process its connection application of if an ASP fails to carry out the required work within the agreed timeframes. The receipt of all information is the critical driver of timeframes and the connection process is often, as a matter of practicality, an iterative process.	The comments are noted. The draft rule clarifies the timeframes in which information would need to be provided by each party. Discussion is outlined in section 5.2.
APA Group (p5)	An agreed time period for the preliminary program should be formally agreed for a project, with commitments made by both parties.	The comments are noted.
ENA (p15)	Other parties external to the application that need to be consulted are not bound by timeframes and are not directly answerable to the connection applicants on the timeliness of their responses. Suggest that this area of potential 'leakage' may, if addressed, assist EG proponents.	The draft rule provides specific timeframes that are to be met by DNSPs. DNSPs will be required to manage the relevant consultations within these periods but the

Stakeholder	Issue	AEMC response
		time awaiting response from other parties will be excluded from the timeframe limits. The process takes into account that connections which may require shared network augmentation can be more complex and, as such, a longer timeframe is provided to address these enquiries. The process also takes into account externalities such as requirements for development approvals.
ENA (pp 16, 17)	The majority of ENA members do not agree that it is feasible or practical to include a specific timeframe to finalise an offer to connect at the time of preparing the preliminary program due to the number of factors which can affect the timeframe. A specific timeframe should not be included in the rules due to the anticipated difficulties of compliance.	The comments are noted. The draft rule sets the timeframe for completing offers to connect at 20 business days for agreed projects. For applications for other projects, the DNSPs would agree an appropriate timeframe once the application has been lodged. Discussion is set out in section 5.2.4.
ENA (p16)	Believes a facility that allows EG proponents and the relevant DNSP to vary the timeframe by agreement to cater for very large and/or complex generator connection applications will assist the installation and integration of EG that benefits all stakeholders.	The comments are noted.
Wood & Grieve Engineers (p3)	The DNSP stipulates the timeframe, which is non-negotiable.	The comments are noted. The draft rule introduces specific timeframes for each stage of the connection process. Discussion is set out in section 5.2.
Department of Primary Industries (Victoria) (p1)	The timeframes required for a decision to be made by the distributor are a source of concern. Consideration should be given to implementing and enforcing a regulatory timeframe for connection offers.	The draft rule sets out specific timeframes for each stage of the connection process. Discussion is set out in section 5.2.

Stakeholder	Issue	AEMC response
Specific comments re 65 business days		
Ergon Energy (pp 8, 9), Endeavour Energy (p12)	Does not support the recommendation to include a timeframe to finalise an offer to connect. Considers imposing a 65 business day limit may result in more onerous application requirements being imposed on connection applicants.	The draft rule sets the timeframe for completing offers to connect at 20 business days for agreed projects. For applications for other projects, the DNSPs would agree an appropriate timeframe once the application has been lodged (within a four month maximum). Discussion is set out in section 5.2.4.
Energex (pp 10-11), Ausgrid (pp 12-13), esaa (pp 1-2)	While 65 days may be sufficient in some cases it would not be in others. Negotiating access standards particularly for larger complex embedded generators may involve detailed analysis by transmission planners, protection engineers and power quality engineers. Would require significant diversion of network engineers away from day-to-day operations at short notice.	The draft rule sets the timeframe for completing offers to connect at 20 business days for agreed projects. For applications for other projects, the DNSPs would agree an appropriate timeframe once the application has been lodged (within a four month maximum). Discussion is set out in section 5.2.4.
Arup (p3), esaa (p2), Jemena (p6)	To ensure the safe, secure and reliable operation of the electricity system, the 65 business day limit should only start once the network service provider has received all relevant information required. It is appropriate that this 65 day clock is stopped while waiting for responses from AEMO where AEMO's involvement is required.	The connection application process under the draft rule provides for the 20 business day timeframe for agreed projects to start when the application is received or, where additional information is requested by the DNSP, from when that additional information has been received. Discussion on the application process is outlined in section 5.2.4.
CitiPower & Powercor (p6)	Connection process generally iterative. 65 business day requirement should commence only once DNSPs have received all required information; should be based on best endeavours and provide stop the clock provisions; and should not	The comments are noted. The draft rule takes into account the issues raised. Discussion is outlined in sections 5.2.3 and

Stakeholder	Issue	AEMC response
	apply to generators seeking to connect to a section of the network that is technically constrained.	5.2.4.
TRUenergy (p3)	Based on experience, considers it is feasible to finalise an offer to connect for an embedded generator within 65 business days. The instances where the connection was not complete within 65 days involved a lack of communication from the DNSP as to what was required from the developer to keep moving the process forward. A clear timeframe to achieve an offer to connect gives developers more confidence in their planning and decision-making processes.	The comments are noted.
APA Group (p5), City of Sydney (p4)	Supports limits on the timing of decisions. By agreeing set time lines for the provision of particular types of information, including times to be dedicated to each step of negotiations - even if only estimates - would add greater confidence and certainty to the process. Having an agreed time period is very important. Any period agreed must be realistic and attainable.	The comments are noted. The draft rule introduces specific timeframes for each stage of the connection process. Discussion is outlined in section 5.2.
Distribution network planning and expansion framework rule change		
DMITRE (p5), United Energy (p6), SP AusNet (p3), Jemena (p4), Essential Energy (p3), ENA (pp 2, 11)	Supports the AEMC's current rule change process for the electricity distribution network planning and expansion framework, which would sufficiently meet the objectives of the proponents' request. The change establishes a set of requirements for the DNSPs' planning processes. These new provisions also includes requirements for the demand side engagement document which has a number of areas of relevance including outlining processes used and provisions for setting charges and terms and conditions.	In making the draft rule, the Commission has taken the existing provisions into consideration.
Wood & Grieve Engineers (p3)	The demand side engagement document proposed would allow for the identification of clear up front requirements so that the total information can be provided as part of the initial submission.	The comments are noted. Taking into consideration raised by other stakeholders, the draft rule requires DNSPs to publish additional information such as example costs, model connection agreements and information to guide applicants on how to apply the connection requirements.

Stakeholder	Issue	AEMC response
		Discussion is outlined in section 5.2.1.
Ausgrid (p13)	The demand side engagement document proposed is also likely to help improve locational signals to embedded generators, which in turn will help improve the efficiency of embedded generation investment.	The comments are noted.
Essential Energy (p3)	The introduction of the RIT-D and the distribution network data (for both subtransmission and medium voltage assets) to be included in the DAPR will give prospective embedded generation proponents the opportunity to identify areas on the distribution system that may benefit from the introduction of a non-network solution and to actively engage with the DNSP to provide this support.	The comments are noted.
Clean Energy Council (p4)	Considers that the demand side engagement strategy will provide a helpful resource for embedded generation proponents. However, further reform is required to ensure that the connection negotiation framework is made more effective by being more effectively supported.	The comments are noted. Taking into consideration raised by stakeholders, the draft rule requires DNSPs to publish additional information such as example costs, model connection agreements and information to guide applicants on how to apply the connection requirements. Discussion is outlined in section 5.2.1.
Endeavour Energy (p8)	A requirement for distributors to publish a demand side engagement document would not resolve these issues [re information provision/availability]. Rather, it would merely facilitate an increase in the amount of consultancy services, project options and studies that a DNSP would need to undertake for a connection applicant (as proposed by the proponents in their rule change submission).	The comments are noted.
Ergon Energy (p6)	Ergon Energy considers that the demand side engagement document will not address the information requirements being proposed by the rule change. This is because it is a forward looking document. However, believes that the value of the document cannot be discounted. Therefore, sees no value in creating onerous obligations which overlap with information requirements already being provided for under the demand side engagement document and generally throughout the	The comments are noted. The draft rule requires additional information to be published to supplement the existing requirements. DNSPs will have flexibility in determining how best to implement these requirements and develop an 'information pack' that reflects their business and

Stakeholder	Issue	AEMC response
	connection process.	jurisdictional requirements.
EEC (pp 5, 6)	The demand-side engagement document would improve processes but does not appear to be sufficiently specific to address information requirements.	The comments are noted. Taking into consideration raised by stakeholders, the draft rule requires DNSPs to publish additional information such as example costs, model connection agreements and information to guide applicants on how to apply the connection requirements. Discussion is outlined in section 5.2.1.
ETSA Utilities (p4)	As noted by the proponent, this requirement to publish annual network capacity reports is unnecessary as it is already covered under the distribution network planning and expansion framework rule change which requires the DNSPs to publish the DAPR identifying capacity constraints.	The comments are noted. In taking into account the network limitation information to be published in the DAPR, the draft rule does not require any additional capacity constraint information to be published upfront. However, the draft rule does require DNSPs to identify any specific network limitations that may affect a potential enquiry at the preliminary enquiry stage. Discussion is outlined in section 5.2.1.
Origin Energy (p4), EnerNOC (pp 2-3)	Emerging network constraints and local network fault levels are key to expediting the connection process for embedded generators. The networks must be required by the rules to support the most efficient outcome for their electricity supply area. This level of efficiency can only be achieved if network planning information identify 'hot spots' is readily available well in advance of the network committing to a decision.	The comments are noted. In taking into account the network limitation information to be published in the DAPR, the draft rule does not require any additional capacity constraint information to be published upfront. However, the draft rule does require DNSPs to identify any specific network limitations that may affect a potential enquiry at the preliminary enquiry stage. Discussion is outlined in section

Stakeholder	Issue	AEMC response
		5.2.1.
City of Sydney (p2)	Proposed changes would significantly improve the connection process for embedded generators by making it clearer, more consistent across jurisdictions, more certain, more efficient and more cost effective for both parties. In particular, the requirement for DNSPs to publish annual reports identifying constraints in their networks for connecting embedded generators.	The comments are noted.
Total Environment Centre (p4)	Network reports on capacity constraints should cover a longer timeframe than the proposed 1 year. The reports would preferably cover a 5 year timeframe to enable an adequate timescale for the development of community renewable energy projects. As a minimum we suggest that a 2 year period is necessary.	The comments are noted. The Commission considers that these issues were considered in depth in the recent rule change on the annual planning report requirements.
EEC (p2)	Proposed rule changes would also need to be accompanied by a requirement on DNSPs to publish detailed maps of network constraints, demand projections and augmentation needs at the sub-station level.	The comments are noted. The Commission considers that these issues were considered in depth in the recent rule change on the annual planning report requirements.
ATA (p3)	Encourages the AEMC to consider the relationship between any improved process for the connection of embedded generators, and the need to become more strategic from a network management perspective about when and where embedded generation is best utilised to alleviate network constraint. ATA questions whether the frameworks that govern network planning currently ensures that full transparent and timely information is provided to all potential energy service providers in the energy market (including on the demand side and including non-generation service providers (e.g. load control or thermal efficiency providers)) to its fullest extent. ATA would encourage the AEMC to consider the frameworks for planning in this regard.	The comments are noted and were taken into consideration.
Terms and conditions		

Stakeholder	Issue	AEMC response
EEC (p8)	Varying terms and conditions between distributors are only marginally related to network requirements, and are largely avoidable. Varying terms and conditions increases transaction costs for connection applicants.	The draft rule requires DNSPs to publish model connection agreements. The NER currently set out the terms and conditions that are to be included in connection agreements.
Clean Energy Council (p5)	The variation of both the technical and legal requirements between different jurisdictions and DNSPs creates significant uncertainty for proponents. The CEC expects that while consistency across jurisdictions may be an improvement to the current process, disclosure of the terms and conditions at an early stage would be an even better means of enabling the connection applicant to manage any risks which may arise.	The comments are noted.
Infratil Energy Australia (p2)	Strong view that a standard Network Connection Agreement approved and reviewed regularly by the AER should be published and made publicly available by all DNSPs (similar to arrangements in the WA market).	The comments are noted. Given the variety of embedded generation technologies and the differences in network configuration and requirements, the Commission does not consider it would be appropriate to introduce standard connection agreements for embedded generators at this time. It is noted that DNSPs could establish 'standard offers' under Chapter 5A and, over time, as these standard offers are made, connection applicants may choose to adopt these under the Chapter 5A process.
Infratil Energy Australia (p3)	Although standard terms and conditions between distributors would be preferable, differing terms are manageable so long as they were published and transparent.	The comments are noted. The draft rule requires DNSPs to publish model connection agreements.
EnerNOC (p3)	Not only that they differ between DNSPs, the problem is that terms and conditions are sometimes made up on the fly and are not subject to scrutiny. Know of one	The comments are noted. The draft rule requires DNSPs to publish model

Stakeholder	Issue	AEMC response
	example where the DNSP inserted a condition that the embedded generators must not be registered as market generators. Whether a generator is registered as a market generator has no bearing on the DNSP.	connection agreements. Disputes regarding their content can still be referred to the AER.
APA Group (p5)	Key point implicit in this section is the need for consistency between distributors - ideally within states and also, of course, nationally. This would assist embedded generation proponents who operate across or within states, and also allow for benchmark comparison and performance assessment between distributors.	The comments are noted. The draft rule introduces new information requirements and clarifies the timeframes that apply to enquiry and application processes. Discussion is outlined in section 5.2.
ENA (pp 19-20), United Energy (pp 2, 9), CitiPower & Powercor (pp 6, 8), Jemena (p8), Ergon Energy (p9), Energex (p11), Endeavour Energy (p13)	Considers appropriate for terms and conditions to vary between distributors to reflect necessary differences. Notes that clause 5.3.6(b)(2) of the rules already specifies that the offer to connect must include the terms and conditions of the kind set out in schedule 5.6. Despite this, the rule change proponents are seeking amendments to clause 5.1.3(b) and therefore effectively ensuring the terms and conditions set out in schedule 5.6 also apply to embedded generators. There is no one-size-fits all or boiler-plate approach to terms and conditions that will be suitable for all embedded generation connections, and as such it is reasonable that the terms and conditions will vary for a range of reasons including: • network configuration differences; • jurisdictional differences; • different DNSP's pre-existing terms and conditions for various class and type of generators; • where automatic access standards are adopted versus where negotiated or minimum access standards apply; • the embedded generator size and consequently its connection to the network, its export capability and reliability, the voltage level of the connection, the number and types of other customers on the same feeder;	The comments are noted and were taken into consideration in making the draft rule. The draft rule requires DNSPs to publish model connection agreements and does not require DNSPs to offer 'standard' provisions. (It is noted that DNSPs may develop 'standard offers' under Chapter 5A of the NER.)

Stakeholder	Issue	AEMC response
	• the fault level headroom on the network which will influence the protection equipment requirements on the connection applicant; and - where augmentation work is required.	
Technical standards		
Underlying problems/requirement for technical standards		
SP AusNet (p2); ETSA Utilities (p2); APA Group (p5); United Energy (p9); Department of Primary Industry (Victoria) (p2)	These stakeholders considered that embarking on the development of technical standards for all embedded generator connections would be helpful to the negotiation of generator connection. In particular, having national technical standards for the actual generation plant and protection and control equipment would be beneficial. Until this is done, processes will tend to be ad hoc and potentially inconsistent within and across electricity distributors - something that correlates with higher than necessary cost that will inevitably discourage investment in embedded generation. However, United Energy considered that the industry is years away from being able to develop such a standard.	The comments are noted. The draft rule does not propose the introduction of nationally consistent technical standards, but does require DNSPs to publish and maintain a register of equipment compliant with its minimum access standards. Discussion is outlined in section 6.4.1
EEC (p8); ENA (p21); Ergon Energy (p10)	The EEC noted that the connection process under Chapter 5 is clearly not functioning, and the development of standards is urgently required. The ENA suggested that the micro generation connection process where there is an Australian Standard allows for a far smoother connection process and it may be beneficial to develop nationally consistent standard technical requirements for each generation class connection below 30MW. Ergon Energy considered that the rule change should not proceed until they are developed.	The comments are noted and were taken into consideration when developing the connection process outlined in the draft rule.
Ausgrid (p12)	Preference for flexibility in the framework to negotiate with prospective embedded generators so that the information required from them can reflect the specific characteristics of the network at their location, and the desired outcomes for the applicant. A framework for connecting embedded generators should focus on principles and outcomes rather than specific detailed technical requirements covering every eventuality.	The comment is noted. The connection process under the draft rule requires the connection applicant and DNSPs to provide increasingly targeted information relevant to the location of the proposed connection through the process.

Stakeholder	Issue	AEMC response
ENA (p21); DMITRE (p4)	Under the provisions of Chapter 5A, DNSPs would be required to make an offer within 10 business days of receiving a completed connection application for any 'standard connection contracts'. To date, most ENA members have not supported the concept of standard connection contracts as the 10 day period is not always sufficient to complete the essential technical and safety assessments required for connecting these customers.	The comment is noted. The model connection agreement mandated by the draft rule are still subject to negotiation.
Wood & Grieve Engineers (p4); DMITRE (p4)	These stakeholders noted that Chapter 5 is very much open to interpretation by the DNSPs and affords them much discretion. Standards will provide greater certainty to suppliers to engineer their systems accordingly. Furthermore, an automatic access standard is already provided for in Chapter 5 (clause 5.3.3) where the Reliability Panel can be requested to determine the adoption of access standards for technical requirements of connection.	The comment is noted. To date the process under clause 5.3.3(b2) of the NER has not been used by market participants to develop a plant standard for embedded generating plant.
Clean Energy Council (p6); Ergon Energy (p10); Toyota Motor Corporation (p2)	When considering the specific requirements of the application process under Chapter 5 as applied to embedded generators, some immediate barriers are identifiable: • the automatic, minimum and negotiated access standards in Schedule S5.2.5 are irrelevant in most cases; • distribution networks operate with characteristics that are sometimes unique to jurisdictions or even to different DNSPs; and • much of the information to be provided under NER Schedule S5.2.4(e1) is relevant to transmission and sub-transmission networks rather than distribution networks. However, DNSPs still apply Schedule 5.2 to all embedded generators of at least 30MW and much of it to those below. Smaller generators do not have to meet all the automatic access standards, but some are still relevant. The decision is done on a case by case basis, there is no simple threshold to be applied because it depends on the location of connection.	The draft rule requires the preliminary response to an enquiry from the DNSP to contain technical information relevant to the application to connect, including minimum requirements necessary to maintain system security and reliability of supply relevant to some aspects of Schedule 5.2 set out in clause S5.2.3(a). Discussion on this point is outlined in section 6.4.1.

Stakeholder	Issue	AEMC response
CitiPower & Powercor (p6); Essential Energy (p1); Energex (p4)	Considered that the negotiation process remains the most appropriate process for connection of non-micro, non-registered embedded generators. The reason why legislation specifically provides that agreement from the distributor is a precondition to a generator connecting to the network is that the network service providers have an obligation to ensure the network operates in a safe and reliable manner. To meet this obligation, a distributor must ensure that a generator connecting to the network does not result in degradation in the quality of supply to the network or other network users.	The comments are noted. The Commission considers that stakeholders have overwhelmingly responded that the negotiation process is not working as intended, so have clarified the connection process for embedded generators under the draft rule to improve transparency.
Origin Energy (p2); ENA (pp 2, 25-26); Ausgrid (pp 6-7)	As networks are not traditionally built to handle two way flows of electricity, one of the major challenges of the connection framework is balancing the obligations of the NSPs for safe, secure and reliable supply of electricity with the commercial timeframes and expectations of applicants. Providing flexibility in determining what technical requirements are most relevant can assist in facilitating efficient commercial outcomes. When the network has no supply capability because network protection equipment is tripped there is a safety requirement that electricity will stop flowing and that embedded generator ceases to operate and export to the distribution network - this includes exporting to a smaller set of customers to ensure that community and employee safety is maintained.	The comments are noted. The draft rule requires the preliminary response to an enquiry from the DNSP to contain technical information relevant to the application to connect, including minimum requirements necessary to maintain system security and reliability of supply relevant to some aspects of Schedule 5.2 set out in clause S5.2.3(a). Discussion on this point is outlined in section 6.4.1.
TRUenergy (p3); Ergon Energy (p9)	These stakeholders noted that the lack of technical standards for embedded generators has resulted in incomplete generator data being sent to the DNSP which in turn has caused delayed connections. There is also a lack of knowledge regarding access standards in terms of what they mean. Ergon Energy spends a considerable amount of time educating proponents.	The draft rule is more prescriptive on the types of technical information to be provided by DNSPs and connection applicants. The information provision requirements of the draft rule will assist in developing proponent understanding of requirements
Ausgrid (pp 6-7)	Undertaking studies to determine the impact of the embedded generator may take time and can often be quite costly to the applicant. This can sometimes be	The comment is noted. The draft rule contemplates that DNSPs will be required

Stakeholder	Issue	AEMC response
	misconstrued by applicants as DNSPs seeking to obstruct the embedded generator's connection by imposing undue burdensome technical requirements, delaying the processing of applications and imposing prohibitive costs. However, it is important to emphasise the necessity of these precautions in order for DNSPs to maintain safety to customers and the public, protection of equipment and reliability and quality of supply.	to undertake network studies and any other due diligence testing as part of their preliminary and detailed responses' to a connection enquiry.
City of Sydney (p2)	DNSPs have discretion to set technical requirements. The viability of smaller generators can therefore be undermined if this discretion is exercised to impose unduly onerous technical requirements. Also, in the absence of an applicable access standard, DNSPs can also apply jurisdictional requirements with the effect of imposing even more onerous additional technical requirements on smaller generators.	The draft rule is more prescriptive on the types of technical information to be provided by DNSPs and connection applicants.
Jemena (p7); CitiPower & Powercor (p6)	To safely operate networks in accordance with technical requirements, DNSPs must undertake detailed, case by case, assessment of the impact of any proposed connection on the network including in terms of security and reliability of supply to other customers. Despite best endeavours to provide technical guidance and support, sometimes the negotiation of access standards becomes protracted because: • applicants claiming the connection and network performance standards are too onerous; • applicants not engaging with Jemena until after they have completed the design, procurement and even the installation of the generator; and • applicants going ahead with the design before receiving a connection offer. Negotiation of access standards is less of an issue when independent consultants with relevant experience are engaged compared to those linked to the manufacturer, installing contractor or supplier of a particular generator.	The comments are noted. As noted above, the draft rule is more prescriptive on the types of technical information to be provided by DNSPs and connection applicants. The draft rule also contemplates that DNSPs will be required to undertake network studies and any other due diligence testing as part of their preliminary and detailed responses' to a connection enquiry. Under the new process, a DNSP will discuss with the connection applicant what is to be negotiated in terms of access standards and then propose them, which will help with the proponents understanding.

Stakeholder	Issue	AEMC response
Currently available technical information		
ENA (p21); United Energy (p 5, 10); Jemena (p11); Energex (pp 11-12); Essential Energy (pp 3-4); Ausgrid (p2)	In the absence of Australian Standards for the non-micro embedded generators, a number of ENA member businesses have developed embedded generator 'access standards' for their own networks - whilst not completely nationally consistent they represent a practical and successful move forward to improve the transparency of requirements. These 'access standards' reflect the view that each connection has to be assessed on the basis of the location and nature of the connection to the distribution system. The DNSPs outlined at left considered that their guidelines contain the necessary technical standards to assist a connection applicant in their design and the information required for assessing a connection application. Most of these guidelines are publicly available on the DNSPs website.	The comments are noted. To the extent that DNSPs have technical requirements relevant to their networks, this information will form part of the DNSPs information pack. Discussion on this point is outlined in section 5.2.1.
Essential Energy (p3)	Where a proponent is interested in providing network support, NSW DNSPs are currently required to publish an annual Electricity System Development Review (ESDR) which outlines the forecast demand and capacity data relating to the subtransmission system together with the identified constraints and potential solutions. This document is available on request by prospective proponents who may be interested in offering non-network solutions. DNSPs also publish information relating to specific network constraints and options for solutions as part of the new network asset project consultation process which also assist generation proponents in developing generation connection proposals.	The comment is noted. This information can be made available as part of the information pack.
Clean Energy Council (p7)	Concluded that DNSPs must be responsible for determining the technical standards relevant to their network and DNSPs must provide the relevant technical information to the connection applicant. DNSPs must also provide all relevant technical data to 'fully assess the commercial significance' of the connection in the development of the connection application. Yet the content of the information to be provided is open to the DNSP's discretion as applied in the individual connection process. In practice DNSPs do not always provide the required level of information or outline technical access standards for the	The comments are noted. To the extent that DNSPs have technical requirements relevant to their networks, this information will form part of the DNSPs information pack and/or preliminary enquiry. Discussion on this point is outlined in section 5.2.1.

Stakeholder	Issue	AEMC response
	connection applicant. In some cases the preference is to assess the generator performance internally without transparency. However, this approach assumes that the connection applicant has decided on the ultimate plant design and characteristics and is therefore willing to accept the connection solution offered by the DNSP irrespective of cost.	
Consistency (local requirements)		
Ergon Energy (pp10-11); Energex (p4); Ausgrid (p4); ENA (p23); EEC (p6)	Ergon Energy noted that 'whilst developing nationally consistent technical standards is preferred, there are jurisdictional and network configuration differences that cannot be overlooked during the development. Each part of a network has local factors such as fault levels and load profiles. Jurisdictional safety requirements will vary also. Energex also stated that 'the significant variances and characteristics between networks across Australia also means that each embedded generator needs to be assessed against certain technical standards. In this respect it is important that distributors maintain the flexibility to have different terms and conditions to technical standards'. However, Ausgrid and the ENA considered that 'whilst it is true that connection requirements vary across jurisdictions, this is a result of differences in jurisdictional legislation and licence conditions'. In NSW, Ausgrid mentioned the level of contestability contributing to connection arrangements and the 'technical requirements may also differ between DNSPs (even within the same jurisdiction) as each DNSP's network is configured differently and subject to different local constraints'. While the EEC appreciated the 'complexity of proposed connections varies and thus impacts costs, there would be benefit in the DNSPs standardising their designs and therefore their costs for various sizes and types of connections'.	The comments are noted. To the extent that DNSPs have technical requirements relevant to their networks, this information will form part of the DNSPs information pack and/or preliminary enquiry. Discussion on this point is outlined in section 5.2.1.
Essential Energy (p2); Wood & Grieve Engineers (p4)	Essential Energy considered a number of factors that 'the connection of embedded generation is dependent on, including: • the voltage and electrical characteristics of the network at the point of connection, and possibly up-stream and downstream from the point of	The draft rule requires the preliminary response to an enquiry from the DNSP to contain technical information relevant to the application to connect, including minimum requirements necessary to maintain system security and reliability of

Stakeholder	Issue	AEMC response
	connection; • the type and capacity of generation system to be connected; • the types and capacities of generation systems already connected, Essential Energy also stated that 'achieving an effective outcome in relation to the considerations of these factors is plant and location specific, which it believes requires a negotiated connection process. It cannot be readily achieved through a proponent nominating an automatic connection entitlement in accordance with some predetermined set of criteria'. In addition, Wood & Grieve Engineers noted that 'when developing standards, the safe, reliable supply, and protection to the grid should be taken into consideration' and did not consider that 'there should be any specific jurisdictional requirements'.	supply relevant to some aspects of Schedule 5.2. Discussion on this point is outlined in section 6.4.1.
Automatic access		
Ausgrid (p11); Energex (p5) ENA (p20) esaa (p3)	Ausgrid and Energex did not 'endorse the concept of providing embedded generators with a nameplate rating between 10kW and 30MW with an automatic right of connection. This is a very broad category and it is unreasonable to assume that large embedded generators (5MW or greater) require the same level of consideration as small embedded generators'. The ENA noted that 'in the absence of minimum 'access standards', the ENA maintains that the proposed rule change should not proceed until the appropriate 'access standards' are developed'. The esaa suggested that 'until appropriate access standards are developed, it is premature to introduce an automatic access right'. The esaa recommended that the 'proposed rule change should be deferred until the appropriate access standards, whether minimum or automatic, have been developed'.	The comments are noted. The draft rule does not permit embedded generators an automatic right of connection.
DMITRE (p4);	It remains appropriate that the necessary technical safeguards remain in place through the connection agreements with the DNSP, either through Chapter 5 or 5A process. The ETSA Utilities' guide to large embedded generator connections	The comment is noted.

Stakeholder	Issue	AEMC response
	states that all export embedded generating units must have a purchase agreement with a retailer and communication links installed so as to provide the necessary network monitoring and control provisions for power quality and safety requirements.	
SP AusNet (p2); CitiPower & Powercor (p6)	Do not think that automatic access would be applicable as the network's capability to safely support generation at load connection points without impacting other network users is extremely variable. For example the fault level contribution from a generator permissible at a CBD location could restrict the size of the generator that can be connected whereas on a weaker part of the network no restriction may apply. Without significant upfront investment in their distribution networks to address fault levels, it would not be possible to determine a single set of technical standards that would safely allow automatic connection of non-micro, non-registered embedded generators to the Businesses' distribution networks - particularly CitiPower's. Before 'automatic access standards' can be contemplated, they require investment to alleviate the fault level constraints that currently exist. This involves augmenting or replacing existing distribution system equipment to safely and securely allow increased connection of embedded generators in areas where the network is being pushed towards its design limits.	The comments are noted. The draft rule sets out the types of technical information that must be provided by both DNSPs and connection applicants. Discussion on this point is outlined in section 6.4.1.
ETSA Utilities (p. 6); ENA (p2)	ETSA Utilities and the ENA supported further work on, publication of nationally consistent technical standards (for embedded generation units and associated protection and control equipment only) but not inflexible automatic access standards. This will simplify the process of assessing the generating system that is to be installed, which is one part of the assessment process. The second component of the assessment process is to determine the potential impact on network safety and security of supply and any augmentation required to address this. As this assessment must be done on a case by case basis there is no opportunity to allow an automatic right of access.	The comments are noted. The draft rule sets out for provisions to enable DNSPs to publish a register of compliant equipment (embedded generation units) that meets its minimum access standards. The technical requirements at the point of connection are anticipated to be undertaken on a case by case basis.
Alinta Energy (p. 2)	Appropriate that a form of automatic access standard for connection be made available for embedded generators. The form of such a standard needs	The draft rule does not make an allowance

Stakeholder	Issue	AEMC response
	consideration in light of the wider review of technical standards that has been proposed for some time.	for an automatic access standard.
Origin Energy (p. 3)	The concept of an automatic access standard may be a good idea in principle, but may have limited value in practice. The automatic connection standard for large scale generation is set at a sufficiently high level to minimise the risk of adverse outcomes resulting from a connection to anywhere on the network. As such, Origin is not aware of a connection agreement that uses the automatic standard; the costs to meet that standard are prohibitively high. At the very least, an automatic standard could set a 'maximum technical standard' which could assist in setting parameters for connection negotiations. This could be beneficial, even if the automatic standard is not used. However, given the nature of embedded generation connections differ from large scale, it could be that an automatic standard could provide more value for those connecting parties.	The draft rule does not make an allowance for an automatic access standard.
Aurora Energy (p. 1)	Does not consider that the provision of unconditional access to direct control services or negotiated distribution services for any one class of network user will contribute towards the NEO which is directed at the long term interest of all consumers.	The comment is noted. The draft rule does not permit embedded generators an automatic right to connect.
Right to export		
ENA (p2)	Does not support an automatic or unlimited 'right' to export to the grid. No other generator has such a guarantee. All connections are subject to the overriding requirement that networks must operate in a safe and reliable way. Limits on exporting energy may be necessary to protect the safe, reliable delivery of electricity to customers (e.g. power quality). Connection contracts would explain what limits may be necessary on export capacity.	The comment is noted. The draft rule does not permit embedded generators an automatic right to export electricity. Discussion on this point is outlined in section 6.4.2.
EEC (p8); United Energy (p10); SP AusNet (p2); Jemena (pp9-10); Energex (pp12-13); Endeavour Energy (p16); Ausgrid (p12);	Where the network is not able to safely and reliably accommodate electricity exported by embedded generators without high augmentation costs this should be limited. DNSPs noted that the ability to export may be a trade-off between generator size	The comments are noted. The ability to export electricity to the distribution network is a matter for negotiation between the DNSP and connection applicant. The NER does not preclude export of electricity

Stakeholder	Issue	AEMC response
Arup (p3); esaa (p3); ENA (p24); Department of Primary Industry (Victoria) (p2)	and export quantities versus shared network augmentation costs required to remove network constraints. The connection applicant makes the value determination of export price versus initial connection costs and ongoing costs. That is, DNSPs considered that the right to export is accordingly subject to the technical and commercial decision making of the proponent. DNSPs need to consider the potential impact on all other customers connected to the distribution network. As such, embedded generators must be treated differently to load due to their potential to impact the quality of supply and safety.	where the connecting parties undertake all network augmentation required to facilitate that export. The draft rule does not permit an automatic right to export.
ENA (p25)	Provided the requirements for connection to a network are satisfied and the exporting of electricity to the network does not adversely affect the quality of supply to other network users or the safety of the network and its users, there should be no reason to limit export to the network. However, it must be recognised that depending on conditions on the local area of the network, there may be a need to limit export as it may impact the voltage level on other customers and could breach the regulated voltage level requirements.	The comment is noted.
TRUenergy (p3); Clean Energy Council (p7)	Considered that if a generator has been disallowed from exporting to the grid, the DNSP is obliged to provide clear and transparent reasons as to why this is the case. A better understanding of these reasons may enable the developer to formulate a solution such as a run-back scheme.	The comments are noted. This is a matter that the DNSP and connection applicant should be able to discuss and should be apparent after the enquiry stage.
EnerNOC (p2)	As part of the connection process embedded generators must be allowed, at reasonable cost and within a reasonable timeframe, to either temporarily ("soft sync") or continuously synchronise with the grid to avoid transitory power outages when switching to the generator from the mains, and vice versa.	The ability to synchronise with the network is a matter that the DNSP and connection applicant should negotiate as part of the connection agreement.
Alinta Energy (p. 2)	The right to export should be divorced from automatic access considerations. Right to export requires discrete consideration by the affected network service providers including ensuring that the embedded generator connections do not unduly degrade the capability of the network.	The comment is noted. The draft rule does not provide an automatic right to export.

Stakeholder	Issue	AEMC response
Endeavour Energy (p16)	An automatic right to export is advocating a significant cross-subsidisation for connecting non-registered embedded generation by network users (as infrastructure works necessary to accommodate energy export into the network from the non-registered embedded generation would be required to be undertaken by DNSPs).	The Commission considers that where an embedded generator undertakes all the investment necessary to allow the export of electricity, the actual export is a matter for negotiation between the connecting parties. The draft rule does not provide an automatic right to export.
City of Sydney (pp. 6-7); Toyota Motor Corporation (p1)	Although embedded generators have the technical ability to export to the grid, in practice, some embedded generators have been prevented from doing so due to the imposition of inappropriate requirements that have disallowed them from exporting electricity into the distribution network. These include inappropriate safety and technical issues, in particular, insufficient 'fault level headroom'. Where exporting is not allowed the economics and carbon abatement of the project is undermined and there would be greater exposure to network charges and carbon pricing than would have otherwise been the case with exporting surplus electricity to the distribution network.	The Distribution Annual Planning Report should provide relevant information about key system fault level limitations and network constraints. This should aid connection applicants in assessing where to site an embedded generator. As noted above, where an embedded generator wishes to export electricity, it must finance any necessary augmentation to allow exports.
City of Sydney (p. 7)	The significant benefits of embedded generators exporting to the distribution network would be lost and replaced by significant additional costs imposed on consumers if embedded generators were not allowed to export electricity to the distribution network. An example of the latter is the huge capital investment in networks during the current 5 year determination period which is driving up electricity bills and making electricity unaffordable for some consumers.	The ability to export electricity is a matter that the DNSP and connection applicant should negotiate as part of the connection agreement.
ETSA Utilities (p. 5)	From its experience, embedded generators have been allowed to export electricity to the network where: • the appropriate network analysis has been undertaken to confirm the safety and security of the distribution network; • any required network augmentation to facilitate the export of electricity has	The comment is noted.

Stakeholder	Issue	AEMC response
	been undertaken; and • a network connection agreement, including a maximum export capacity, has been signed by ETSA Utilities and the customer. The success of the above simplified process is demonstrated through the fact that ETSA Utilities has approximately 300MW of export embedded generators connected to our distribution network.	
Grid Australia (p. 2)	Embedded generators often require the services of the distribution network in the main to provide a secure back-up supply when they are not generating; export surplus electricity; and regulate the quality of exported electricity. In providing these services and satisfying the safety, security, reliability, flexibility and power quality needs of the electricity market as a whole, (distribution) network businesses must ensure that safety, protection, reliability, quality of supply and establishment of appropriate access standard issues to consider. Grid Australia considers that these principles need to be clearly taken into account when the proponents as for the ability to export back to the grid.	The comment is noted. As noted above, the ability to export electricity is a matter that the DNSP and connection applicant should negotiate as part of the connection agreement. That is, the draft rule does not prevent these principles being taken into account.
APA Group (p. 5)	Subject to grid security, supports the principle of having an automatic right to export to the grid. Should achieve greater certainty for embedded generator proponents by providing certain export rights.	The draft rule does not provide an automatic right to export.
Wood & Grieve Engineers (p. 5)	Where embedded generators are not able to export to the grid, the options available to a project would be limited. It also encourages smaller plant, which is less efficient and less financially feasible.	The comment is noted.
Feasibility and implementation		
Jemena (p9); Endeavour Energy (pp14-15); Ausgrid (p2&20); Ergon Energy (p10)	Consider that technical standards for non-registered embedded generation between 10kW(single phase) or 30kW (3 phase) and 5MW should be the first step in any review. Recognising the different forms of generation and distribution system configuration, differing technical standards should be applied within this	The draft rule is not proposing the introduction of nationally consistent technical standards in the NEM. Discussion on this point is outlined in section 6.4.1.

Stakeholder	Issue	AEMC response
	range. Standards should be informed by various factors including: — size and type of generation to be connected; — voltage level at which the generation is to be connected; — protection system; and - nature of connection (import/export). Ausgrid noted that typically the size, complexity and duration of system studies increases with increasing connection capacity and voltage. Also, as the generator connection voltage increases, the equipment specifications for connection to the network may become more onerous due to the impacts the generator can have on system performance.	The draft rule provides details of the types of technical information that must be provided by DNSPs and connection applicants throughout the connection process.
City of Sydney (p6); Wood & Grieve Engineers (p4); EnerNOC (p3)	These stakeholders suggested separate technical standards should be provided for microgenerators, below 5MW and above 5MW similar to the UK. There should be no specific jurisdictional or local requirements. The scope of such standards should cover the generation of the power supply waveform, reliability and grid protection measures and installation requirements. In principle and in concept, they would be similar to AS 4777 for inverter systems as these are referred to by NER Chapter 5A. It is possible to standardise the technical requirements, however they would be more extensive than AS 4777.	The draft rule is not proposing the introduction of nationally consistent technical standards in the NEM. Discussion on this point is outlined in section 6.4.1.
ENA (p23)	Standards should be relatively high level, performance focussed documents with minimal prescriptive content to allow the embedded generator to arrive at optimal solutions. The scope of such standards should only apply to EG equipment and installation practices. Further, the ENA is strongly of the view that this equipment must be certified to an acceptable and relevant international or Australian Standard.	The draft rule is not proposing the introduction of nationally consistent technical standards in the NEM. Discussion on this point is outlined in section 6.4.1.
Ergon Energy (p3)	Recommends the next steps should focus on encouraging greater collaboration between NSPs, EG proponents, AEMO and other technical experts in developing appropriate access standards for different classes of embedded generators.	The draft rule is not proposing the introduction of nationally consistent technical standards in the NEM. Discussion

Stakeholder	Issue	AEMC response
		on this point is outlined in section 6.4.1.
Ausgrid (p11)	Any standards that are developed to cover all potential situations for such a broad category of generators is likely to be rigid and prescriptive; and conversely, may act to hinder rather than facilitate connections.	The draft rule is not proposing the introduction of nationally consistent technical standards in the NEM. Discussion on this point is outlined in section 6.4.1.
Overseas standards		
SP AusNet (p2); City of Sydney (pp5-6); EnerNOC (p2)	SP AusNet noted that 'Australia is lagging overseas jurisdictions in this area. Examples of such standards include the IEEE1547 series standards in the USA and the G83 and G59 Connection Standards applied in the UK. Some development work has been conducted by the ENA which could serve as a basis for developing Australian standards'. Similarly, the City of Sydney considered that 'in the UK standardised technical standards have been available for more than 20 years. The UK Electricity Act 1989 places a legal duty on distribution network operators to provide a connection for embedded generators ... There are technical standards for micro-generators, below 5MW and above 5MW. The main technical standard is G59/2 for embedded generators above 5MW'. For protection systems in particular, EnerNOC considered that 'it would be a mistake to create a new, NEM specific technical standard, as this would require protection equipment to be designed, manufactured, and certified specifically for Australia - all sources of additional, unnecessary cost. It would be greatly preferable to adopt protection requirements from another region, such as the requirements for sub-5MW plant under UK Engineering Recommendation G59/2. This way, it should be possible to buy suitable integrated protection equipment off the shelf'.	The Department of Resources, Energy and Tourism engaged AECOM Australia to undertake a study into the feasibility of developing nationally consistent technical standards for Australia. As part of its Interim Report, AECOM Australia provided a literature review of the technical standards in operation in a number of countries overseas. AECOM Australia considered that these 'international standards would provide a rich source of information for developing a national technical standard [for Australia]'. As the AEMC is not proposing to develop a national technical standard as part of its draft rule determination, it has not investigated further the potentiality of introducing international technical standards to Australia. Discussion on this point is outlined in section 6.4.1.
Network planning and design (fault level headroom)		

Stakeholder	Issue	AEMC response
CitiPower & Powercor (p6)	'Without significant upfront investment in their distribution networks to address fault levels, it would not be possible to determine a single set of technical standards that would safely allow automatic connection of non-micro, non-registered embedded generators to the businesses' distribution networks - particularly CitiPower's'. These businesses raised the issue of 'increasing the fault level headroom with the AER and sought approval for funding to undertake investment in its 2011-2015 regulatory control period to increase the fault level headroom. However the AER did not approve this investment as they considered it should be funded by embedded generators rather than all customers'.	The comment is noted. The Commission considers that the cost of any augmentation of the network to facilitate the connection of embedded generators should be borne by the connection applicant. Further analysis of the Commission's reasoning may be found in section 7.4.2.
EnerNOC (p5)	EnerNOC noted the 'importance of including all information relevant to generator proponents, such as the fault level headroom in each area, and what the DNSP is planning to do to rectify it, if it is too low'.	The comment is noted. The Commission considers that the information being made available in the Distribution Annual Planning Report and the preliminary enquiry response should address issues with system fault level limitations.
Clean Energy Council (p8); City of Sydney (p10)	The Clean Energy Council noted that 'in general and especially with regards to generation located in central business districts, "fault level concerns" would be the main driver for refusal [to connect embedded generators]. In many central business districts, fault level issues are present and real and their removal can require significant costs above those which most non-registered embedded generators are capable of accepting. However, the continued refusal for the connection of new generation is hard to justify under the conditions that loads such as motors and other devices which also contribute incrementally to fault level are continually added to the system. Transparency is required in order to identify the issues and properly inform connection applicants to make efficient decisions'. On the other hand, the City of Sydney mentioned a recent CSIRO report commissioned by the ENA that 'raises the question about the extent to which co/trigeneration projects raise fault levels and the appropriateness of the requirement for a safety margin'.	The comment is noted. As noted above, the Commission considers that the information being made available in the Distribution Annual Planning Report and the preliminary enquiry response should address issues with system fault level limitations. In relation to system fault level limitations in central business districts, the information in the DAPR should provide a more reliable indication of fault level limitations. The report cited by the City of Sydney is noted.

Stakeholder	Issue	AEMC response
Dispute resolution processes		
Toyota (p2)	Toyota noted that it had 'identified issues and risks associated with embedded generation in the processes to appeal should an application be rejected by a DNSP'.	The draft rule introduces an independent expert appraisal process for disputes relating to technical requirements. Further information on this process may be found in section 6.4.1.
Connection charges and network augmentation costs		
fee-for-service objective		
United Energy (p2); Clean Energy Council (p8); SP AusNet (p3); Private Generators (p2)	These stakeholders considered there is no need to include an optional fee given there is already a contestable market providing such services and there appears to be no restriction on the provision of this service now. Therefore, no rule change is required.	The draft rule clarifies that DNSPs may charge an enquiry fee as part of the connection process. This fee is to allow a DNSP to recover the reasonable costs incurred in the initial investigations for the connection of an embedded generator up to the point of connection. Discussion on this point is outlined in section 7.4.1.
Jemena (p11); ETSA Utilities (pp2, 7); ENA	Jemena considered that 'such a rule change that explicitly allows optional fee-for-service would be useful'. ETSA Utilities supported 'this concept and believed that where the customer engages the DNSP as early as possible then any embedded generation component of the project is more likely to be delivered successfully'. The ENA noted that 'the majority of ENA member businesses welcomed the opportunity to work with proponents in developing their connection applications for a "fee-for-service"'.	The comments are noted.
Ergon Energy (p12); EEC (p2)	Ergon Energy supported the 'current process where the AER decides the classification of a DNSP's services and the form of price control to apply to these	The draft rule does not oblige the AER to take oversight of the determination of any

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	services as part of a distribution determination'. The EEC noted that 'reporting is critical. For example, while the EEC supports the concept that DNSPs could charge some forms of network connection work on a fee-for-service basis, as DNSPs are monopolies it is appropriate that the AER has an oversight role to determine if the fee-for-service is reasonable'.	enquiry fee. The general principle is that fees and charges should be cost reflective and should reflect the reasonable costs of the work carried out by the DNSP to prepare the detailed enquiry response.
APA Group (p5); City of Sydney (p8)	Not unreasonable to allow distributors to charge a fee-for-service in relation to assisting a proponent to connect to the network. The fee should be reasonable and should also relate to the time taken to undertake the work - something that might vary from project to project.	The comments are noted.
Aurora Energy (p2) Endeavour Energy (p8)	Does not support the concept of DNSPs taking on the role of electrical consultant during the connection process. Given that there will be a contract formed between the generator and the DNSP for the provision of distribution network services there would exist a potential for 'conflict of interest' issues to arise were the DNSP to provide consultant services to the generator.	The comments are noted. Provision of consultancy services fall outside of the NER in this regard.
ENA (pp 28-29)	Does not agree with the rule change proponents' suggestion that distributors do not have an incentive to collaborate in the connection enquiry phase or in the development of the connection application. If the rules were to be changed in this respect, the ENA suggests that the following text as an addition to 5.3.3(b)(7) better addresses the rule change proponents' concerns in the response to connection enquiries: • 'Details of any additional fees or services that the Network Service Provider may provide to facilitate feasibility studies, options analysis or design or any other activities that will assist the connection applicant's connection application.'	The draft rule addresses the ENA's concern by grouping the enquiry and application fees within the same clause.
Definition of the service that would be provided		
CitiPower & Powercor (p7)	Noted that 'there are already provisions under Chapter 5 (clause 5.3.3(b)(7)) for DNSPs to recover the cost of processing connection applications, and suggested that the proposed rule clarify that the fee-for-service relates to the preparation of	The comment is noted. The draft rule sets out the purpose of the enquiry fee and

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	connection applications including addressing enquiries from connection applicants'.	application fee.
ENA (p28); Jemena (p11)	The ENA and Jemena supported 'a rule change that explicitly allowed an optional fee-for-service where these services could include initial investigations on the distribution network up to the embedded generator point of connection including network studies (e.g. fault levels calculations, impact to distribution network protection etc.) prior to a connection applicant submitting a connection application'. These stakeholders suggested that 'the fee-for-services may potentially reduce the application fee for processing the connection application'.	The comments are noted. As noted above, the enquiry fee should reflect the reasonable costs of the work carried out by the DNSP to prepare the detailed enquiry response. Similarly, the application fee is to reflect the cost of carrying out the tasks associated with processing the connection application. Accordingly, to the extent that the DNSP undertakes more work upfront in assessing the detailed enquiry, the subsequent assessment of the connection application may require less analysis. Therefore, it is expected that the application fee would reflect the reduction in analysis required by the DNSP.
Arup (p4); Jemena (p11); ENA (p29)	Arup stated that 'LNSPs should be able to charge a "design fee" where resources are required to design network elements to accommodate the proposed embedded generator. Also in early engagement between the proponent and the LNSP, the LNSP should be capable of providing indicative budget costs to assist the proponent in finalising a decision to proceed, at no cost to the proponent'. Whereas, Jemena and the ENA 'emphasised that the design of a generator installation is the responsibility of the generator proponent'. They considered that 'distributors are unlikely to have the specialised in-house design expertise and would bring significant legal liability which a distributor may not wish to take one. That is, connection applicants should directly engage their consultants for the design of a generator installation. A distributor would only seek to influence the design to the extent that the integrity of the design is seen to be inadequate and	The comments are noted. Any consultancy types services such as, design elements of an embedded generator connection should be a matter for negotiation between the DNSP and connection applicant.

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	may undermine the reliability and quality of supply to other users of the network'.	
Fee-for-service current arrangements		
ENA (p28); Energex (pp13-14)	Under current jurisdictional arrangements, some DNSPs are already entitled to charge an application fee for large customer connection applications (which includes small and medium embedded generator applications). The service is currently classified as an alternative control service (quoted service), and the fee is determined in accordance with the quoted services formula determined by the AER. It covers all work reasonably anticipated to arise from investigation of the connection application and preparing the offer to connect.	As noted above, the draft rule clarifies that a DNSP may charge an enquiry fee for reasonable costs. The draft rule does not seek to alter the classification of services which may or may not be the subject of an enquiry fee. Discussion on this point is outlined in section 7.4.1.
Ausgrid (p14)	Considers that the existing regulatory structure for charging fees associated with processing connection applications is appropriate and sufficient. The DNSPs in NSW are currently in the process of proposing an additional service to the AER that specifically relates to generator connections (as part of the next regulatory control period commencing 1 July 2014). If the AER approves this proposal we consider that this will provide a clear mechanism for DNSPs to recover the efficient costs in assessing generator connections.	The comment is noted. The draft rule does not seek to alter how such services are classified.
United Energy (p11); Department of Primary Industry (Victoria) (pp34)	Currently in Victoria under Guideline 15, can charge an application fee, which covers investigation work once the distributor has received an application and includes any investigation work and preparation of an offer. Guideline 15 prevents a distributor from charging for any information that the distributor provides during the enquiry stage. Guideline 15 is expected to fall away at the commencement of the NECF arrangements. Department of Primary Industry (Victoria) noted that 'under Section 3.2 and Section 3.3 of the Essential Services Commission of Victoria "Electricity Industry Guideline No 14", distribution businesses are entitled to recover a capital contribution from customers in limited circumstances where the incremental cost in relation to the connection offer is greater than the incremental revenue'.	The comment is noted.
Fee-for-service classification of services / guideline		

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Ergon Energy (p12); Total Environment Centre (p4)	Ergon Energy and TEC supported the current AER process. 'This process appropriately determines how the costs associated with a DNSP providing services are to be recovered from customers and on what basis prices are to be determined and approved by the AER throughout a regulatory control period. That is, fees for services should be determined by the AER, not by monopoly network businesses through negotiations with proponents'.	The draft rule has not proposed to use the AER classification process for determining an enquiry fee. This is because in the event that an enquiry fee was calculated to reflect the service classifications determined by the AER a high degree of prescription would need to be introduced to the NER. Further, the regulatory determination process seems adequate regulation of this issue. Discussion on this point is outlined in section 7.4.1.
ENA (p29) United Energy (p12); Jemena (p11); Ausgrid (p24)	The ENA noted that 'the AER applies criteria specified in the rules to determine how services should be classified. The AER then determines the form of control that applies. For some DNSPs assessing generator connection enquiries or applications are classified as standard control services. If the AER concurs that the service is a standard control service, the form of control is likely to be a cost-based (fee or quoted) mechanism'. Conversely, United Energy considered 'such services should be unclassified services'. While Jemena thought that 'fees should be negotiated between the parties on a full cost recovery basis, that is, the fee-for-service should be classified as a negotiated service'. By contrast, Ausgrid was of the view that the 'service provided by NSW DNSPs in assessing generator connection enquiries or applications is a direct control service'.	The comments are noted. The classification of connection services varies significantly between DNSPs, therefore, using this classification system to determine an enquiry fee would be difficult. The AER, as part of the regulatory determination process, can regulate this issue appropriately.
Wood & Grieve Engineers (p5); City of Sydney (pp8-9); Department of Primary Industries, Victoria (p3)	Wood & Grieves thought 'it may be difficult to identify a standard fee. The fee could be time based or design stage based and identified in line with fee guidelines'. The City of Sydney considered that the 'fee-for-service would need to be subject to agreement with the connection applicant who would also need to agree to the type and duration of the services required. For a monopoly regulated utility the	The comments are notes. The Commission considers that any enquiry fee should be determined by DNSPs consistent with the existing provisions relating to the application fee (or other forms of control that may be in place for that DNSP).

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	service should be provided on a cost recovery basis only. The rules should provide guidelines on how such a fee should be determined to aid negotiations between the distributor and embedded generator. The fee does not need to be approved by the AER but the embedded generator should have the right of appeal to the AER on any claimed over-charging by the distributor. The AER guidelines would be used for this purpose and would act as a test of the good faith provision'. An alternative charging approach was suggested by the Department of Primary Industry, Victoria. It suggested that the fee-for-service could be a flat rate charged per MW of installed capacity for all connections up to 5MW that reflects the average cost to the distributor.	
Network augmentation costs		
Payment of shared network augmentation		
Wood & Grieve Engineers (p6); City of Sydney (p9); Toyota Motor Corporation (p2)	Embedded generators should be exempt from shared network augmentation costs to formally encourage the take up of embedded energy. This may reduce augmentation costs in the long term due to the postponement of network upgrades particularly when district solutions are considered, or solutions for multiple buildings. The current approach to attributing connection costs, particularly in relation to shared network augmentation costs, is inefficient, discriminatory and not cost-effective. The approach is based on a fallacy that only co/trigeneration projects contribute to network congestion. For example, to higher fault levels. This is incorrect as even standard supply only connections contribute towards fault levels in the network.	The comments are noted. However, the draft rule does not make provision for the exemption of embedded generators paying shared network augmentation in either Chapter 5 or Chapter 5A. Discussion on this point is outlined in section 7.4.2.
DMITRE (p2); EEC (p10); United Energy (p2); SP AusNet (p3); Ergon Energy (p13); Energex (pp15-16);	Stakeholders did not support the proponents' proposal that the NER be amended so all embedded generators are exempt from paying shared network augmentation costs.	The comments are noted. Discussion on this point is outlined in section 7.4.2.

Stakeholder	Issue	AEMC response
Private Generators (p2); ETSA Utilities (pp1-2); Green Building Council of Australia (p3); EnerNOC (p5); Endeavour Energy (p19); Ausgrid (p14); esaa (p2); ENA (p31); AER (p1)	In support of this position, stakeholders noted that: • all embedded generators like all connection applicants should be provided with user pays signals and should not be cross-subsidised by existing customers and vice versa; • this is consistent with the SCO proposal that the connecting user pay, in the same way it pays for its connection and extension assets, for any necessary augmentation to the shared network; • embedded generators should not be treated differently to load or other generation; and • the current approach is consistent with the AER's connection charge guidelines. The ENA also noted that shared network augmentation is a core distribution service, the costs of which are recovered in use of system charges levied on load customers. In circumstances where a customer requires an augmentation to the shared network, the assets will generally be considered to be 'dedicated', and the customer will be requested to provide an appropriate capital contribution. This approach is applied to all connecting customers, whether load customers or generation customers.	
United Energy (p12); Jemena (p12); City of Sydney (p10); Department of Primary Industry (Victoria) (pp 3-4)	United Energy noted that the 'Victorian Guideline 15 restricts the connection charges to shallow connection costs for a generator connected on the low voltage network, but this Guideline is expected to fall away on the commencement of NECF'. Jemena stated that 'ESCV Guideline 14 requires all customers seeking connection to contribute to the capital cost of new connection works and	The comments are noted. Discussion on this point is outlined in section 7.4.2.

Stakeholder	Issue	AEMC response
	augmentation of the shared network. Underlying principle that those who impose a burden on the network should be required to contribute their share of the cost of network augmentation'. The City of Sydney considered that 'costs should be allocated in line with the Victorian Government's position under Guideline 15 and other jurisdictions should only charge connection costs and not shared network augmentation costs'.	
Ausgrid (p14)	Currently in NSW, IPART has determined the capital contributions and repayments for connections for electricity distribution networks in NSW, which applies to customers. Ausgrid applies the principles under this decision for generator connections. Also notes the AER's connection charge guidelines.	The comment is noted.
Arup (p4); APA Group (p5); EEC (p10)	These stakeholders considered that 'if a financial benefit is created for the electricity distributor, due to the connection of an embedded generator, then any fees or costs that would otherwise by paid by the generation, would be offset by any savings generated by the connection'. That is, 'some consideration should be given to sharing of cost benefits associated with deferred augmentation for LNSPs where the embedded generator reduces the planned growth in load on local network assets and deferral of planned works'. The EEC stated that 'while embedded generators should theoretically receive some form of payment where they defer network investment, in practice it is extremely rare for an embedded generator to receive payment for network augmentation deferral'.	The comments are noted.
Addressing the 'last in, worst dressed' issue		
Jemena (p13); City of Sydney (p9); Arup (p4); EEC (p2)	The proponent of an embedded generator should not be charged with the full augmentation costs on a 'last in worst dressed' basis. These stakeholders considered that 'this approach is inequitable as it penalises the connection applicant that requires a marginal augmentation without considering the contribution of previous connections, and a standard formula for sharing costs on	The NER currently provides an avenue through which DNSPs and connection applicants are able to manage this issue (where the services in issue are negotiated distribution services). One of the principles relating to access to negotiated distribution

Stakeholder	Issue	AEMC response
	a consistent basis needs to be established across jurisdictions'. The City of Sydney suggested that 'to mitigate issue of the "last in, worst dressed", propose embedded generators and distributors could consider a cost sharing scheme - akin to a 'pioneer' scheme that applies to load customers. Whereby subsequent embedded generators refund the original embedded generator who had funded the cost of removing network constraints at a particular location (e.g. fault level reduction) to the extent of the benefit they get'.	services (which govern the negotiated distribution services criteria set out in a regulatory determination) foreshadows the possibility of cost recovery. Discussion on this point is outlined in section 7.4.2.
AER connection charge guidelines		
CitiPower & Powercor (p. 7) Essential Energy (p. 4); Endeavour Energy (p. 17); ENA (p. 19); AER (p. 2); esaa (p. 2); ENA (p. 30)	Stakeholders noted the AER's final connection charges guidelines. Essential Energy and Endeavour Energy believed that 'the current connection and contestability guidelines applicable in NSW, the current AER approved connection policies and the recently published AER connection charge guidelines effectively outline the process a DNSP undertakes when publishing and applying connection charges'. The ENA noted that the 'current approach to attributing connection costs, particularly in relation to shared network augmentations, is approved by the AER as part of a DNSP's distribution determination. Under both Chapter 5 and Chapter 5A the treatment of shared network augmentation costs is efficient, equitable and cost reflective'. Supports a rule change clarifying that the pricing principles under Chapter 5 should be consistent with pricing principles under Chapter 5A and the AER's final connection charges guidelines that provides that the connection charge for non-registered embedded generators will be calculated on the total cost of the works required to support both the generation and load components of the connection service. The guidelines further clarify that service for removing specific output constraints should be classified as alternative control, negotiated or unregulated services and	The AER's connection charges guidelines have a very specific purpose under Chapter 5A of the NER and may be summarised as follows. Under Chapter 5A distributors are required to have model standing offers for new or altered connections. These offers need to be consistent with their revenue determinations and a connections policy. The connections policy needs to be consistent with charging principles and guidelines that reflect them and with which connection policies must comply. The purpose of the connection policy is to set out thresholds below which retail customers will be exempt from paying for augmentation. The Guidelines and connection policy are intended to provide a relatively uniform framework from existing jurisdictional requirements and facilitate a smooth

Stakeholder	Issue	AEMC response
	that the non-registered embedded generators should pay for the cost of these services in accordance with the AER's final distribution determination. Considers the current approach to attributing connection costs, particularly in relation to shared network augmentation costs, seeks to balance the economic and equity considerations. Further the ENA supports consistency in the approach for calculating connection charges under both Chapter 5 and 5A of the rules and therefore the AER's final connection charges guidelines. Considers that embedded generators do not pay for more than a reasonable contribution for shared network augmentation. Notes the AER's guidelines on connection charges where businesses will be required to pay for their share of the network upgrade with any additional connections on the same line potentially resulting in a rebate to the first connector. Consider that a similar scheme for embedded generation would be a more appropriate way to avoid the first-mover disadvantage.	transition from such jurisdictional requirements to this framework. As such, the current guidelines, as they relate to embedded generators, relate to [micro] embedded generator customers who are also load customers. Given the differences between Chapters 5 and 5A, the Commission has not recommended applying the AER's connection charge guidelines to connections under Chapter 5 of the NER.
Other considerations		
EEC (p. 2)	Considers that the proposed changes could impose unreasonable costs on energy users. Therefore recommends that 5.5(db) be redrafted to the effect of: "A Distribution Network Service Provider must seek permission from the AER if it wishes to maintain its distribution network in a state where it is not able to receive the supply of electricity from an Embedded Generator."	Given that the draft rule does not provide embedded generators with an automatic right to export, this suggested amendment to the proposed rule is not relevant.
EEC (p. 2)	Recommends clarification by adding in after 5.3.6(b): (iv) details of upstream augmentation required to provide the connection service and associated cost. Once the AER has set up guidelines around the allocations of costs for connection and upstream augmentation, the costs charged by the DNSP must be in line with these guidelines (v) an itemised statement of payments for network support services, including any savings from avoidance / deferral of network augmentation.	As noted above, the draft rule does not recommend adoption of the AER's connection charge guidelines, therefore it will not be possible to charge for augmentation in conjunction with these guidelines. The itemised statement of payments for network support services has not been included in the itemised statement of connection charges. Network support payments should be negotiated

Stakeholder	Issue	AEMC response
		between the connection applicant and the DNSP(as currently required by the NER) and included in the connection offer.
Energex (p15); ENA (p31); Ausgrid (p14)	The ENA and Energex considered that the AEMC should consider whether it is appropriate for an embedded generator to pay shared network charges for the shared network capacity notionally made available to the generator to export energy into the distribution network (a benefit embedded generators currently receive for free). In this context, the intended operation of clause 6.1.4(a) of the rules should be clarified. Similarly, Ausgrid thought 'it is important to note that generator connections do not pay network use of system charges, which is the typical mechanism for DNSPs to recover general augmentation costs of load customers'.	The draft rule has not made provision for embedded generators to pay distribution use of system charges on the electricity they export to the grid.
Alinta Energy (p. 2)	Is of the view that it would be premature for the rule change to address issue of payment of shared network augmentation costs as this matter is currently being more broadly considered as part of the TFR. The need for locational signals, including on distribution networks, needs to be considered holistically and this extends to meeting actual costs of augmentation. A failure to meet those costs may force further costs onto customers within a specific distribution network. Any conclusion in this regard should be made with reference to the conclusions of the comprehensive TFR.	The comment is noted.
Benefits		
EEC (p. 1)	Cost-effective embedded generation can reduce the costs of electricity services for energy users supplied by the embedded generation and, if the embedded generation unit reduces the need for network augmentation, also for other parties connected to the network.	The comment is noted.
ATA (p3); City of Sydney (p8)	ATA's recent comprehensive research into the economics of standalone power systems (APS) as an alternative to network augmentation, demonstrates the	The comments are noted.

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	growing value proposition of demand side generators. The City of Sydney noted a report by the Institute of Sustainable Futures that estimates that the City's plans to supply 70% of the local government area's electricity needs from a 360MWe trigeneration network by 2030 could achieve savings in deferred electricity network costs and avoided costs of new power station capacity to serve the city's growing demand in the order of $1.5 billion by 2030.	
Aurora Energy (p2)	Observes that the rule proponents refer to the environmental characteristics of proposed embedded generation plant. Aurora acknowledges that the environmental credentials of proposed generation is potentially of interest to society but notes that DNSPs are restricted to consideration of the electrical characteristics at the agreed point of connection between the generator and the DNSP and the effects of any connected party upon the operation of the distribution network and other network users.	The comment is noted.
Ausgrid (p5)	It is widely accepted by DNSPs that embedded generators can provide benefits to both customers and networks. However, what is often overlooked is the fact that realising those benefits is not always straight forward or simple.	The comment is noted.
ENA (p26)	Notes the common arguments against making a deferred DUOS or TUOS payment include: • that generators cannot, for technical reasons, be relied on for network support and have no contractual obligation to operate at times that they are needed; and • that an upgrade to the shared network is often required to accommodate embedded generation, both to manage fault level requirements, and voltage regulation in order to accommodate the embedded generators export, as well as additional capacity and connection points to convey the generated energy.	The comment is noted.

Stakeholder	Issue	AEMC response
Transparency / Itemised statement of costs		
EEC (p6); Clean Energy Council (p4)	EEC members have reported significant lack of clarity on connection costs until very late in the connection process. Results in wasted time and resources waiting for answers. The CEC's experience is that connection costs are often provided in single line breakdowns and are often non-negotiable. Without clearly defined information provision requirements on all matters relevant to the development of the connection in the applicable rules it is not possible for a proponent to identify opportunities to negotiate, or to take action to reduce costs and connect efficiently.	The comments are noted. The draft rule now requires an itemised statement of costs to be provided with a connection offer.
TRUenergy (p3); Alinta Energy (p2); Sustainable Regional Australian (p3); APA Group (p4); City of Sydney (p3); Wood & Grieve Engineers (p2)	Agrees that including an itemised statement of connection costs in the offer to connect would improve current arrangements by giving developers greater visibility into their connection. Connection costing should be consistent across DNSPs and apply to all types of connections. An itemised statement of connection costs would allow for greater accessibility of information to include in feasibility studies and in particular, budget preparation for feasibility scenario modelling purposes. An offer to connect should include an itemised statement of connection costs including standard connection charges, meter type and cost, costs of system extension, details of upstream augmentation and any other costs.	The Commission's draft rule places an obligation on DNSPs to make available information of the types set out in the proposed rule. The draft rule also obliges DNSPs to provide this information as part of the detailed enquiry response. Discussion is outlined in section 7.4.3. The draft rule now requires an itemised statement of costs to be provided with a connection offer.
Ergon Energy (p6); Energex (p7); Infratil Energy Australia (p2); ENA (pp10, 11)	Each embedded generators' connection will vary by size, location and complexity. Therefore standard fees are not applicable and instead the application fees and connection costs will be calculated specific to the individual embedded generator (using the AER approved formula and input rates).	The comment is noted.
Infratil Energy Australia (p3)	Are not convinced that an itemised statement of connection costs really addresses the issues raised above (re transparency on how costs are arrived at and whether they are reasonable). Rather would suggest that the scope and	The Commission has not recommended the use of an independent party to determine the connection charges.

Stakeholder	Issue	AEMC response
	costs be determined by an independent party based on information provided by both parties.	Disputes surrounding costs and scope can be referred to the AER. However, the draft rule does oblige DNSPs to provide an explanation of the factors affecting each component of itemised cost estimates.
ENA (p. 15)	Some ENA members already provide the customer with itemised connection costs as relevant to that particular connection. However, the ENA does have reservations with the use of 'standard' connection charges terminology in relation to connections that may be variable in the nature of the work required to meet the particular access requirements.	The comment is noted. The term 'standard' connection charges has not been used in the draft rule.
United Energy (p1, 7); Ergon Energy (p7)	United Energy supported a change to Chapter 5 to require itemised costs to include the relevant connection charges, meter type and cost, costs of system extensions, details of upstream augmentation to provide the connection and associated costs and any other incidental costs and the basis of their calculation. Does have reservations in using the wording 'standard' connection charges - these can be quite variable in the nature of the work to meet the particular access requirements. However, Ergon Energy considered that it is inappropriate to transfer the itemised statement of connection costs that is proposed under Chapter 5A to Chapter 5. The connection costs should be part of the commercial arrangements that are negotiated between the parties. Ergon Energy considers that the current arrangements are appropriate and should not be amended.	The Commission has amended Chapter 5 to oblige DNSPs to provide an itemised statement of charges. The Commission acknowledges that these connection charges may form part of the commercial arrangements, but to provide greater transparency to the connection process, it has recommended that they be added to Chapter 5 of the NER.
Ergon Energy (p6); Endeavour Energy (p13)	In relation to costs, Ergon Energy refers all customers to our AER approved pricing proposal for each regulatory year and our capital contributions policy. Both of these documents are available on Ergon Energy's website and provide details of the fees associated with Ergon Energy's distribution services. However, Endeavour Energy and Ausgrid noted that 'connection charging by DNSPs is regulated by the AER and varies between network service providers.	The draft rule notes that DNSPs provide the itemised statement of charges so far as relevant. To the extent that a particular item is not required or is a contestable service, the DNSP would need to let the connection applicant know.

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	As such, it would be expected to vary between jurisdictions and DNSPs'.	
Endeavour Energy (p9); Ausgrid (p18)	An itemised statement of connection costs would offer little improvement to the connection arrangements in NSW, due to the existing contestability regime for connection services.	The comment is noted. The itemised statement of charges would only be relevant for monopoly services provided by the DNSP.
United Energy (p5); Jemena (p4)	While reasonably supportive of most of the drafting proposed in new Rule 5.3.1A, does not consider that the connection fee is something that could go on the website as this may vary for different size generation units, different connection infrastructure requirements at the site, different access standards that are negotiated etc. Complexity of embedded generator will also result in a range of application fees. Rules already exist to require a connection offer to make clear the basis for the distribution service charges and rules also exist to enable a connection offer to provide different connection options/ charges as part of the offer. Not practical to publish information on the calculation of connection costs, as it would be project specific. In any case, clause 5.3 currently sets out the requirement for parties to provide necessary information.	The draft rule clarifies that a DNSP may charge an enquiry fee, but does not oblige DNSPs to publish this fee. The Commission considers that to the extent that a DNSP is able to provide the basis of any calculation of costs, this should be provided to the connection applicant as part of the enquiry and application process.
Grid Australia (p4)	Notes that the proposal to add a clause to require NSPs to provide details of the applicable fee to the connection applicant within 10 business days (proposed new clause 5.3.3(b)(7)). Notes that Clause 5.3.3(c)(5) already requires the NSP to provide this type of information within 20 business days. To create a similar clause as a new requirement under clause 5.3.3(b) creates duplication and exposes NSPs to a new civil penalty provision. Grid Australia does not consider this appropriate.	The comment is noted. The proponent's proposed clause has not been added to the draft rule. Information about fees are to be made available in both the enquiry and application stages of the connection process.
General / Other comments		
EEC (p2)	The rule change proposal will need to be followed by three significant pieces of work: — developing the conditions for automatic access;	The comment is noted. At this stage, the Commission is not proposing to develop technical standards for the connection of embedded generators. Discussion is

Stakeholder	Issue	AEMC response
	— developing schedules of the information that embedded generators need to provide to DNSPs. The AER will need to approve the schedule required by all DNSPs, and will need to check to determine if DNSPs are asking for additional, unnecessary information that is not included in the schedule; and — developing a clear process for determining fair allocation of the costs for connection, (including deep augmentation), ongoing network charges (DUOS and TUOS) and determining fair allocation of the benefits of avoided / deferred network augmentation.	outlined in section 6.4.1. In relation to shared network augmentation, the Commission has not altered the current arrangements. That is, where augmentation is required to connect an embedded generator, it would be obliged to pay those costs. Discussion is outlined in section 7.4.2.
EEC (p2)	However, the full benefits of the rule change proposal will only be realised if the AER undertakes more proactive regulation of DNSPs. The current system relies on embedded generation proponents taking complaints about connection processes to the AER. However, embedded generation proponents are reluctant to damage their relationships with DNSPs, given that they are likely to be obligated to deal with them again in the future.	The comment is noted.
CitiPower & Powercor (p5)	Do not consider that the connection fee is something that could be published on the website as this will need to be developed and based on information specific to each connection including infrastructure connection requirements and generation size. DNSPs are also required, under the rules, to detail the connection charge in each connection offer.	The comment is noted. The draft rule does not oblige DNSPs to publish the enquiry fee on its website.
ATA (p2)	Strongly supports the rule change proposal and the intent behind achieving greater certainty for proponents with regards to costs, contractual obligations and timeframes. Ultimately, the ATA's view is that the NEM will only achieve true competitiveness, in the long term interest of consumers, when the demand side acts on a level playing field with the supply side. This includes full competition for the provision of all energy services within the market, where the market actively selects demand side solutions where they are more cost effective than traditional supply side investments.	The comment is noted. The draft rule now includes an independent expert appraisal process which is also expected to aid in dispute resolution.
Ergon Energy (pp4-5)	Does not agree that the definition of embedded generation should be amended	The comment is noted. The definition of

Stakeholder	Issue	AEMC response
	and does not believe that the current definition is ambiguous.	Embedded Generator has been changed in the draft rule to extend it to those persons who have made a request to comply with Part A of Chapter 5 (clause 5.1.2).
City of Melbourne (p1)	By introducing requirements for the development of technical standards and introducing greater transparency in connection costs and charges, the proposed rule changes will increase certainty and transparency and will better enable proponents to engage with utilities in a timely manner.	The draft rule does not introduce requirements for the development of technical standards. To the extent that these standards are developed in the future, a rule change would be necessary to include these standards in the NER.
Total Environment Centre (p3)	Support the applicability of the proposed rule not only to co- and tri-generation plants in city buildings, but also to such CRE projects, which are being planned and constructed in rural and regional areas, although this model may also apply to urban environments such as large rooves and derelict or contaminated land.	The comment is noted and the draft rule provides a connection process for any type of embedded generator.
Grid Australia (p4)	With respect to the proposed amendment that 'each party must provide the other with information the other reasonably requires in order to facilitate connection to the network', notes that this clause would also be subject to the existing rules prescribed confidential information provisions.	The comment is noted. The confidentiality provisions in the NER have been amended in the draft rule to also include connection applicant, which will extend the confidentiality provisions to embedded generators who are not otherwise registered participants and choose to use the Chapter 5 processes.
Ausgrid (pp9-10)	Notes the initiatives that have been undertaken to date by MCE, AEMC, ENA and Ausgrid.	The comment is noted.
APA Group (p3)	APA's views are that policy to govern distributed generation should be developed and implemented so that it: — facilitates the identification and removal of the barriers to entry, thus allowing a role for lower emission fuels in achieving energy efficiency and emission	The comment is noted.

Stakeholder	Issue	AEMC response
	reduction objectives; — does not discriminate in favour of one fuel type or technology over another; — enable asset owners to make decisions on economic grounds; — ensure incentives to reduce peak demand are available to any party that achieves demand reduction; — recognises the key role distributed generation has in facilitating efficient investment across both electricity and gas networks; and — ensures feed in tariffs and distributed generation objectives are consistent with the objectives of the Clean Energy Act 2011.	
ENA (pp26-27)	Generally DNSPs plan the network on the basis that the embedded generation will not be generating (irrespective of the ability to export) and then enter network support agreements with existing embedded generators to defer specific investments where it is technically and commercially viable to do so. As part of this process the reliability of the generator to provide cost effective network support is assessed. It should be noted that it is not necessarily a requirement for a generator to operate in parallel with (and export energy to) the network to be suitable for network support. For example, many customer backup generators are used for network support via an agreement to simply remove the customer load off the grid and transfer it to the generator in island mode.	The comment is noted.