Submission to the Australian Energy Market Commission

Proposal to amend the National Electricity Rules for connecting embedded generators

ClimateWorks AUSTRALIA

seed advisory

PROPERTY COUNCIL of Australia

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REQUEST TO MAKE A RULE FOR EMBEDDED GENERATION CONNECTION

1. DETAILS OF THE ORGANISATIONS MAKING THE REQUEST

ClimateWorks Australia **Seed Advisory** **Property Council of Australia**

ClimateWorks Australia is an independent non-profit organisation. It was founded in 2009 through a partnership between The Myer Foundation and Monash University with a mission to substantially reduce Australia's greenhouse gas emissions over the next five years. It embarks on practical projects to reduce emissions focused on implementation where barriers to action remain.

Seed Advisory is a commercial advisory firm specialising in the energy sector, with expertise in strategy, risk management, policy development and commercial management. Seed Advisory advises government and corporate clients on issues relating to the development, operation and performance of wholesale energy markets, retail energy markets, and regulated energy markets.

The Property Council of Australia is the largest advocacy organisation for the property industry. It has 2200 member companies that represent assets of over $600 billion. Property Council members are responsible for Australia's greenest buildings and developments. The members aspire to further transform buildings, precincts and cities to higher levels of environmental performance.

The property industry is Australia's largest industry. It is:

- 11.5 per cent of the economy;
- the country's largest employer, employing just under 1.3 million workers; and
- in 2010, $147 billion was added to GDP from property services and construction.[1]

Furthermore, nearly 780,000 Australians invest directly in property. Over 11.6 million Australians have an indirect investment in property via their superannuation funds.[2]

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Additionally, the partner organisations are grateful to the parties (state and federal government representatives, energy and property companies) which were involved in the 2011 Unlocking Barriers to Cogeneration (UBC) Project.

Particular recognition is given to the UBC case studies: Colonial First State Global Asset Management, Crown Melbourne, Leighton Properties and the APN Property Group, Monash University, Moreland Energy Foundation and Places Victoria (formerly VicUrban). They provided information on their commercial projects and attended the workshops with the other participants.

[1] AEC Group, *The economic significance of the property industry to Australia*, 2012.
[2] Property Investment Research, *Funds data*, 2011.

2. EXECUTIVE SUMMARY

Embedded energy benefits and demand

Embedded generators are electricity generating plants that are connected to the electricity distribution networks. The networks are owned and operated by distribution network service providers (DNSPs). Cogeneration (combined heating and power) and trigeneration (combined cooling, heating and power) are two types of embedded generation. They offer consumers, governments and the national electricity system significant benefits such as:

- greater energy efficiency compared to conventional energy sources;
- an opportunity for consumers and governments to reduce environmental emissions;
- higher private sector innovation in energy production, delivery and consumption;
- the potential to reduce network infrastructure investment as co/trigeneration increase; and
- the prospect for enhanced security of energy supply.

Increasingly, Australian property developers and owners seek embedded energy systems, such as co/trigeneration, for existing buildings and new developments. This is a result of a growing demand for 'greener' buildings and precincts. Several factors are driving this demand, including:

- Tenant preferences ─ higher grade buildings have lower vacancy rates.
- Financial gains ─ lower operating costs, higher rental and capital yields.
- Healthier workplaces ─ better air quality and thermal comfort.
- Corporate social responsibility ─ obligations to be sustainable businesses.
- Environmental leadership ─ CEOs' and directors' direction.
- Government procurement and leasing policies ─ green leases.
- Government programs ─ Clean Energy Future package and the carbon price; Commercial Building Disclosure scheme.

Connection barriers for embedded energy systems

Despite these benefits and demand for embedded energy systems, the National Electricity Rules (NER) effectively deter embedded generators from connecting to the electricity grid. Consequently, the connection process is:

1. Uncertain
2. Complex
3. Burdensome
4. Time consuming
5. Inefficient
6. Costly.

The six aspects of the connection process were demonstrated through market-ready case studies, which were analysed during the Unlocking Barriers to Cogeneration (UBC) Project.[3] The objectives of the UBC Project were to identify barriers facing the deployment of cogeneration, and to determine how these barriers could be solved.

[3] The UBC Project involved representatives from the cogeneration demand and supply chain, including cogeneration proponents and DNSPs. The report is available at http://www.climateworksaustralia.org/ClimateWorks_Unlocking_Barriers_to_Cogeneration_Report.pdf

This rule change proposal addresses the main barrier identified by the UBC Project – namely, the connection process, and it proposes solutions.[4] Although the case studies in the UBC Project were co/trigeneration projects, the same connection barriers exist for other embedded generators. This is why this proposal seeks to overcome connection barriers for embedded generators more broadly, not just for co/trigeneration.

Solutions for connecting embedded generators to the electricity grid

In order to improve the connection of embedded generators to the national electricity grid, changes to the NER are required to:

1. Provide an **automatic right of connection** to the grid and standard access terms. This would apply to generators that meet 'Automatic Access Standards.'

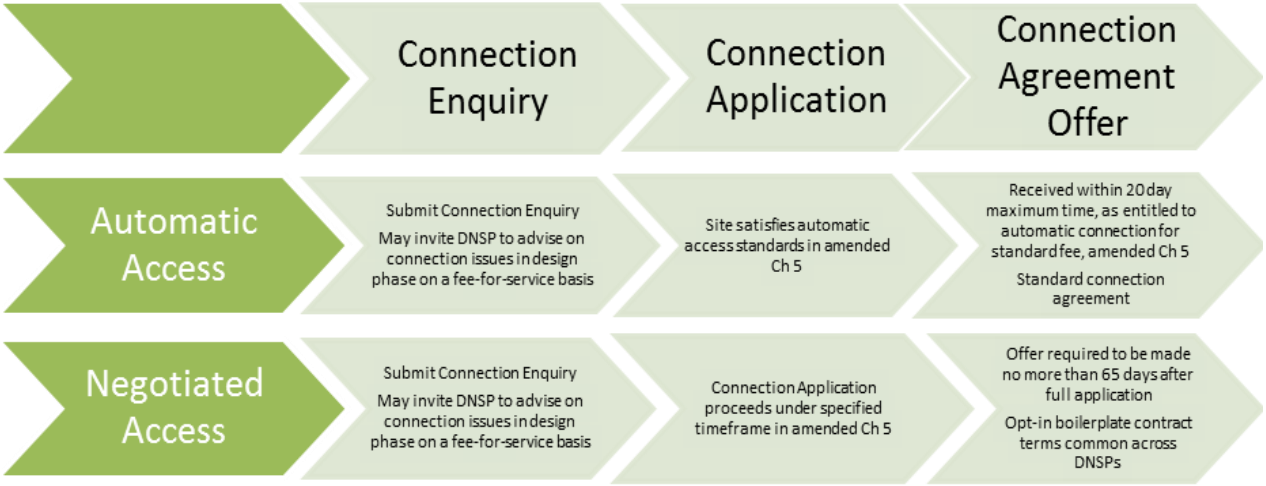
2. Enable embedded generators a **right to export electricity** to the grid.

3. Provide an **improved connection process** for **embedded generators that are ineligible for automatic access** and a right to export electricity to the grid.

4. Allow **DNSPs to charge an optional fee-for-service**. This is to promote collaboration with proponents during the connection process.

5. Oblige **DNSPs to publish annual network reports** identifying where capacity is limited.

The chart below summarises the proposed new connection process with rule changes.



These changes can be easily incorporated into Chapter 5 of the NER, which already sets out elements of a streamlined connection process for large generators. The changes are also similar to aspects of Chapter 5A of the NER, which provides a streamlined connection process for micro-embedded generators.

Significantly, the proposed changes aim to replace case-by-case negotiations with a standardised process that is clearer, more certain and efficient. Ultimately, this proposal is designed to encourage embedded generation without compromising the integrity of the national electricity grid.

[4] The rule change also builds on the findings of many studies over the past decade. They too have reviewed the disincentives to embedded generation and proposed changes to the connection process and other elements of the NER.

Benefits of these rule changes

The National Electricity Objective aims to promote efficient investment in, as well as the efficient operation and use of, electricity services for the long term interests of electricity consumers. This proposal is consistent with this objective. It will deliver direct and wider economic and societal benefits, including:

- reduced connection costs for current and prospective proponents and DNSPs;
- lower payback periods on low carbon and renewable energy investments;
- a boost to adaptation and innovation in the electricity market;
- enhanced economic and energy efficiency and productivity;
- the potential to support adaptation to a low carbon economy;
- reduced demand on the electricity network, especially peak demand; and
- the potential to lower escalating electricity prices for businesses and households.

3. THE CURRENT RULES

The NER contain two chapters that deal with the connection of generators to the national electricity grid – namely, Chapter 5 (entitled 'Network Connection') and Chapter 5A (entitled 'Electricity Connection for Retail Customers'). Chapter 5A will come into force on 1 July 2012. As will be explained below, connection of embedded generators to the grid is not clearly accommodated within either Chapter 5 or Chapter 5A of the NER.

3.1 Chapter 5

Chapter 5 has clearly been drafted with large generators in mind. In particular, the generators that are covered by Chapter 5 are subject to onerous requirements regarding the technical requirements with which they must comply in order to connect to the grid (Schedule 5.2). They may also be required to provide detailed information regarding the profile and operation of the generator in support of an application to connect to the grid (Schedule 5.4). Application of these requirements to smaller generators, including cogeneration plants, is burdensome, time-consuming and costly. In many cases the project may not be viable or, at least, would be seriously compromised.

To alleviate this burden, a standing exemption from registration exists for generators with a nameplate rating of less than 5 MW. In addition, an exemption may be available upon application for generators with a nameplate rating of between 5MW and 30MW[5]. The practical effect of exemption is that smaller generators who are eligible for exemption need not comply with the requirements imposed on other larger generators under Chapter 5 of the NER, including Schedules 5.2 and 5.4.

However, notably, clause S5.2.1(b) of Schedule 5.2 effectively vests discretion in DNSPs to impose the technical requirements contained in Schedule 5.2 on otherwise exempt smaller generators. This allows DNSPs to determine if a connection is likely to cause a material degradation in the quality of supply to other users connected to the grid. The viability of smaller generators could be undermined if this discretion is exercised to impose unduly onerous technical requirements. Alternatively, in the absence of an applicable access standard, DNSPs may apply jurisdictional requirements with the effect of imposing additional technical requirements on smaller generators.

3.2 Chapter 5A

Whereas Chapter 5 establishes a connection framework that is suited to large generators, Chapter 5A has been drafted with small generators in mind. In particular, the connection framework established under Chapter 5A has been designed predominantly to accommodate micro-embedded generators – that is, those generators that have a generating capacity of no more than 10kW.

Under Chapter 5A, DNSPs are required to have a model standing connection offer for 'basic connection services', which are services that are directly connected to the distribution network. Basic connection services are not available for 'non-registered embedded generators' – that is, those that are not micro embedded generators or those that have availed themselves of the exemption from registration. In other words, most cogeneration plants with a nameplate rating of up to 30MW that have obtained exemption from registration would not qualify for a basic connection service.

[5] However, jurisdictional requirements, such as the requirement that all embedded generators of 10MWs or more in Victoria comply with AEMO's requirements, can operate to modify the effects of this exemption.

Chapter 5A also contains a mechanism for the establishment of a model standing offer for 'standard connection services', which could include the connection of cogeneration plants to the grid. However, DNSPs have discretion, rather than an obligation, to establish a model standing offer for these services.

Further, DNSPs have discretion in establishing classes or categories of customers eligible for a particular standing offer. This gives rise to the potential for multiple connection processes to co-exist, depending on the categories adopted by DNSPs. There would also be the risk that the categories differ as between DNSPs within the same jurisdiction. Therefore, there is a possibility that the existing connection process for cogeneration plants, which is described in the next section of this proposal, will not be materially improved by the introduction of Chapter 5A. If every DNSP in the National Electricity Market (NEM) was to use the embedded generation categories proposed by the Energy Networks Association for cogeneration – mini, small, medium and large – and proposed a different process for each category, there would be 44 separate processes in the NEM for cogeneration connection.

4. THE PROBLEM

The preceding section illustrated that the existing regulatory framework for connecting embedded generators to the national electricity grid contains a clear gap for generators with a nameplate rating of between 10kW and 30MW. This includes the vast majority of cogeneration plants. The introduction of Chapter 5A is not anticipated to address this problem.

This regulatory gap has resulted in case-by-case connection processes, which are characterised by uncertainties in relation to:

- regulatory requirements imposed at the national and jurisdictional levels;
- connection enquiry and application timelines;
- information that is required to achieve connection;
- technical requirements imposed on generators as a condition of connection;
- costs of connection; and
- terms of connection.

These uncertainties increase the complexities and burden on proponents' time, resources and connection costs, and may impose significant costs to DNSPs[6]. These characteristics of the existing connection process for cogeneration were clearly demonstrated through the case studies that were analysed as part of the UBC Project and are discussed below.

4.1 Inconsistent national and jurisdictional regulation

The process of transitioning the obligations of jurisdictional regulators to the national regulatory authorities has introduced a level of uncertainty in relation to the appropriate rules and guidelines to be applied to connection applications. For example, in Victoria a number of jurisdictional instruments, including the Distribution Licenses, the Distribution Code and Guidelines (issued by

[6] In particular, DNSPs appear to experience enquiry costs from project proponents who are often described as "tyre kicking". Presumably, that is project proponents regarded by DNSPs as unlikely to lodge a connection application. Elements of this proposal would reduce the burden of these enquiries. This can be achieved by requiring technical standards to be met, or by enabling DNSPs to provide a fee-for-service consultancy on the embedded generator characteristics for the relevant site.

the Essential Services Commission) relating to connection applications and the connection of embedded generators, impose a higher level of performance on DNSPs. This includes establishing a timeline for processing connection applications, providing for an effective right to export and clarifying the costs that an embedded generator is entitled to be charged.

However, as all connection disputes are now referred to the Australian Energy Regulator under the national regime, differences of opinion have arisen about the continued application of jurisdictional instruments. This has introduced another level of uncertainty into the current application process. An embedded generation project proponent may prefer the jurisdictional requirements, but the absence of a jurisdictional dispute resolution process encourages connection applications to proceed under the NER, which is seen by some as offering less direction.

4.2 Inefficient, case by case connection processes

The steps associated with the connection to the national electricity grid under Chapter 5 and Chapter 5A are relatively clear. The process, however, as described in those chapters is insufficiently prescriptive to provide certainty to connection applicants about the requirements for a successful application, the timeframe in which an application will be considered or the costs of connection. These uncertainties impose particular costs on small-to-medium sized generators, including cogeneration plants. In the case of potential embedded generation projects, the uncertainties relating to the connection process can result in significant delays. These delays may result in significant costs relative to the cost of the project as a whole. As a result, a project proponent may be actively discouraged from pursuing a connection application.

Embedded generation project proponents' experiences indicate that each application for connection of a cogeneration plant is considered by DNSPs on a case-by-case basis. Hence, the approach taken by the DNSP in relation to one application for connection may differ markedly from the approach taken by the same DNSP in relation to another application. DNSPs (and embedded generators) are obliged to consider the safe operation of the network. The obligation encompasses both the safe interaction of the proposed equipment to be connected to the network with other elements of the network. This includes other customers' installations, as well as the particular characteristics of the relevant section of the network where an embedded generator is proposed.

The case-by-case considerations currently required would be significantly reduced by the rule change proposal in this submission (see Section 5 below, specifically re developing a schedule to Chapter 5 that specifically relates to the required characteristics of equipment to be installed for Automatic Access). This would benefit DNSPs and project proponents.

Once a connection enquiry has been made, the lack of a binding regulatory framework can mean that DNSPs may not promptly respond to a request for connection. Further, the process included in Chapter 5 is based on a "propose/respond" model. This is out of step with current project planning and development processes, which are characterised by team-based, multi-disciplinary, problem solving approaches. The current process in Chapter 5 does not recognise a role for the DNSP in this process and provides no basis for their involvement outside the "propose/respond" model. An adequate incentive, such as a "fee for service" for advisory services provided by the DNSP on request by the project proponent, would encourage a DNSP to participate in the development of connection applications. This has the potential to significantly reduce costs of design changes during the application process for embedded generation proponents.

4.3 No clear and binding timelines

There are no binding timelines to ensure that embedded generation connection applications are progressed, and either approved or refused, within a specified period of time. This has led to situations where the timeframes and milestones for the construction and commissioning of the plants, and connection of that plant to the national electricity grid, have been misaligned. Consequently, in some cases, connection to the grid occurs many months after the plant is ready to be commissioned and the building is occupied.

In the experience of the UBC Project case studies, the misalignment of timeframes results in significant additional costs in:

- design;
- redesign;
- procurement;
- changes to the procurement package; and
- project delays.

Overall, these costs affect the value of the opportunity to the project proponent and consumers.

4.4 No standard information requirements

There are currently no standard requirements regarding the information that must be submitted by an embedded generation proponent to the DNSP. Depending on the DNSP, there may be no published information about the required information at all. Rather, the requirements vary from DNSP to DNSP and project to project. Further, the information requirements may change during the course of a project. For instance, when DNSPs seek additional information at any time, the proponent may be under the impression that the information requirements had already been fulfilled.

Finally, the nature of the information requirements, where specified, may be inconsistent with current commercial design, development and procurement practices. For example, the requirements for detailed and specific information on the make and model of the plant to be installed at a point in the design process before procurement packages have been finalised[7].

4.5 Diverse technical requirements

As previously noted in this proposal, DNSPs have some discretion regarding the technical requirements that they might impose on embedded generation proponents. At times, DNSPs may impose significant technical requirements on the basis that these are required to protect the DNSPs network infrastructure and the integrity of the grid more generally. However, compliance with these requirements can result in significant costs and even undermine the viability of a cogeneration project, particularly if the technical requirements are not clearly and comprehensively identified at the beginning of the connection process.

Finally, DNSPs' views about the appropriate technical solutions are binding. This is 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 grid. This is even for balancing purposes, resulting in a smaller than optimal unit being chosen by the project proponent to restrict the need to balance the system's output externally.

[7] In addition, changes may be made to the proposed equipment by the DNSP after the procurement package has been completed for the developer, imposing additional costs and delays on the project commissioning.

4.6 Significant connection and network augmentation costs

The costs associated with securing connection of an embedded generation plant to the national electricity grid are typically uncertain. Moreover, in the experience of the project proponents in the UBC Project, costs are significant and, at times, prohibitively expensive. Generally, the DNSP will charge the proponent for the cost of connection application. In addition, depending on the jurisdiction, shared network augmentation costs due to connecting a plant to the grid are sought, not just the costs relating to the project proponent's own requirements.

There is often a lack of clarity and transparency regarding responsibility for, need for and the costs of augmentation of the network. Augmentation of the network may provide benefits to other network users, all of whom should share in the cost of augmentation.

However, based on the case studies of the UBC Project, the principle that appears to be applied by DNSPs in allocating shared network augmentation costs is 'last in, worst dressed'. In other words, the proponent whose connection application coincides with a ceiling being reached on local network capacity (such as available fault level headroom) may be asked to meet the full costs of the augmentation, which, as a result of the lumpy nature of network augmentations, are likely to exceed the proponent's own costs[8]. No recognition is given in these cases to the contribution of earlier connections to exhausting the available network capacity or the benefit to future applicants of the investment undertaken by the project proponent.

This problem is compounded by the lack of transparency concerning the existing capacity of the local network for new cogeneration connection before a connection application is made. In this regard, proponents are not equipped to determine whether there is sufficient network capacity available.

4.7 Different connection terms amongst DNSPs

The terms and conditions applicable to connection of a cogeneration plant to the grid may vary significantly from DNSP to DNSP. The absence of standard terms and conditions means that it is difficult for cogeneration proponents to anticipate the requirements and, therefore, the costs associated with connection. Further, the terms of connection agreements are frequently onerous, one sided and not negotiable – a connection agreement is a necessary precondition to connection.

[8] The allocation of system augmentation costs also appears to be inequitable. It distinguishes certain network customers' contribution to network capacity from that of other customers' similar contributions, based on the customer category rather than the contribution towards system capacity.

5. PROPOSED SOLUTION

In order to facilitate the connection of embedded generators to the national electricity grid, and to address the connection barriers, changes to the NER are required to:

- Provide an automatic right to connection to the grid.
- Entitle export of electricity to the grid.
- Provide an improved connection process for embedded generators that are ineligible for automatic access and a right to export electricity to the grid.
- Allow DNSPs to charge an optional fee-for-service. This is to encourage them to work collaboratively with proponents during the connection process.
- Require DNSPs to publish an annual report identifying where network capacity may be limited.

These changes can be easily incorporated into Chapter 5 of the NER, which already set out elements of a streamlined connection process for large generators. The changes are also similar to aspects of Chapter 5A of the NER, which provide a streamlined connection process for micro-embedded generators.

These changes to the NER will replace case-by-case connection negotiations with a standardised process that is clearer, more certain and efficient. We deal with each of these proposed changes in turn.

5.1 Develop automatic access standard for embedded generators

An automatic right to connection for standard embedded generators should be available to plants that meet an automatic access standard. This automatic access standard would be established to ensure that only plants that will not compromise the integrity of the grid are granted automatic access.

The notion of an automatic access standard is already provided in Chapter 5 of the NER, which requires the Reliability Panel to determine appropriate generator performance standards. Standards may be proposed for a particular class of plant by third parties and may become the applicable standards for that class of plant provided that they are approved by the Reliability Panel. This provides an avenue for the development of automatic access standards for particular types of cogeneration plants. A DNSP is precluded from refusing connection to the grid if the automatic access standard has been met.

The automatic access standard for cogeneration plants should be complemented by a standard connection agreement similar to the model standing offer provided for under Chapter 5A. In particular, Chapter 5A requires 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 cost of connection. Similarly, Schedule 5.6 of Chapter 5 contains standard terms and conditions that must be contained in connection agreements covered by that Chapter.

Automatic access should be provided under the NER as a matter of priority for cogeneration systems up to 5MW because, relative to their size and capacity, the current costs of connection are disproportionately high and the connection process unduly burdensome. As automatic access standards are developed for larger cogeneration plants with a nameplate capacity of

between 5MW and 30MW and approved, automatic access would be extended to these larger projects consistent with these standards.

PROPOSED CHANGES TO NER	EXISTING PROVISIONS
Provide for automatic connection of equipment meeting the standard set in the NER for embedded generators of the relevant class in Chapter 5.	- Chapter 5 specifies automatic access standards and minimum access standards for different categories of generator (by type and size). - Chapter 5A proposes that basic connection services are available for retail customers who are micro-embedded generators. A model standing offer for a basic connection service must specify, among other things: safety and technical requirements; commits the DNSP to a timeline for the commencement and completion of the work; details the basis for the connection charge, including requiring a standard connection charge for dedicated (that is, customer specific) assets, excluding special circumstances; and details any special technical or other requirements related to the connection. - Chapter 5 also contains standard terms and conditions that must be contained in connection agreements, including details of the relevant technical standards applicable, connection service charges, and duration and termination

5.2 A streamlined connection process

Some embedded generators may not be eligible for automatic access because of the particularities of the plant, which may warrant a tailored approach. The process for the connection of cogeneration plants that are ineligible for automatic access could be significantly improved by streamlining the negotiation process through:

- prescribed timeframes;
- standard information requirements;
- standard connection charges; and
- common contract terms.

As mentioned earlier in this rule change proposal, Chapter 5 of the NER was developed with large generators in mind. While there are elements of the connection process prescribed in Chapter 5 that would be useful to facilitate connection of cogeneration plants, Chapter 5 currently appears to envisage a commercial negotiation between two equally powerful parties to achieve connection to the grid, which is the sole objective of the project. This approach is clearly not appropriate for the connection of relatively small cogeneration plants seeking to meet multiple objectives – of which, connection to the grid is only one – and would need to be modified accordingly.

In this regard, there are elements of Chapter 5A of the NER that are useful. Chapter 5A provides for a streamlined process for negotiation for smaller generators. In particular, Chapter 5A sets

out a negotiation framework, including principles that apply to the negotiation process, timelines, information that must be made available by the DNSP and the proponent, and guidelines for connection charges. This streamlined process could be reproduced for connection of cogeneration plants under the proposed process for automatic access. Recognising that automatic access represents a significantly lower burden on DNSPs in evaluating a proposed connection than negotiated access, the timeframe for connection applications to be accepted under the automatic access provisions should be 20 business days.

With respect to connection charges, Chapter 5A provides for the charging of standardised unit charges for augmentation in relation to basic connection services. We have proposed that, with respect to embedded generators, unit charges that can be recovered should be restricted to connection and extension costs and should not include shared network augmentation costs, consistent with the existing position in Victoria. Alternatively, recognising the AER's argument that Chapter 5A is inconsistent with the extension of an exemption for embedded generators from shared network augmentation costs, a proposal to change Chapter 5A will follow this rule change proposal.

PROPOSED CHANGES TO NER	EXISTING PROVISIONS
Provide for negotiated access for embedded generators in Chapter 5 for connection applications where:	- Chapter 5 provides for negotiated access standards to apply to a specific connection, which must be at least as good as the minimum access standard, but, by definition, fall short of the automatic access standard.
- the equipment does not meet the automatic standard or has not been considered under the automatic standard; or	- Chapter 5A envisages two possibilities: standard connection services for DNSP-defined classes of connections other than those captured by the basic connection service; and negotiated connections, for everyone else.
- the application is inconsistent with the automatic access standard in other ways (such as where the Project proponent rejects the DNSP's terms and conditions).	

PROPOSED CHANGES TO NER	EXISTING PROVISIONS
Timelines to be included in Chapter 5 to impose outer limit on timing of decisions to accept or reject a connection application.	- Chapter 5 provides for explicit timelines relating to the connection inquiry process, but includes no explicit timelines in relation to the connection application process. - In Victoria, the Distribution Licences impose a 13-week (65 working days) timeline in relation to connection offers, provided that the connection applicant has provided the DNSP with all the necessary information. - Chapter 5A proposes a 10 day turnaround for applications for basic connection services and a 65 day turnaround for negotiated connections.
Connection charge principles to be included in Chapter 5 to address network augmentation.	- Chapter 5A proposes that users of basic connection services pay a unit cost for connection, but that shared network augmentation costs are not included in this charge. The AER's recently released Draft Guidelines argue that Chapter 5A precludes embedded generators from being treated in a similar way. That is, embedded generators are required by Chapter 5A to pay shared network augmentation costs, even though this represents a significant departure from current jurisdictional approaches. If this view is correct, then changes may be required to Chapter 5A.

5.3 Optional fee for service payable to DNSPs

Under the current connection process for embedded generators, DNSPs do not have a strong incentive to collaborate in the development and improvement of a connection enquiry or application. In order to provide the DNSPs with a greater incentive to collaborate constructively, the NER should allow DNSPs to charge an optional a fee-for-services provided in the development of a connection application. This fee would be additional to any connection application fee. However, the connection application fee currently levied should be reduced to account for the improved alignment between the project and the DNSP's connection requirements when connection is ultimately achieved.

Chapter 5A offers some guidance in this regard. Chapter 5A empowers DNSPs to charge a connection applicant (in relation to a negotiated connection contract) a reasonable fee to cover expenses, directly and reasonably incurred by the DNSP, in assessing the application and making a connection offer. However, a 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 provided.

PROPOSED CHANGES TO NER	EXISTING PROVISIONS
Allow DNSPs to recover fee for service during connection process under Chapter 5	- Chapter 5A empowers DNSPs to charge a connection applicant in relation to a negotiated connection contract a reasonable fee to cover expenses directly and reasonably incurred by the DNSP in assess the applicant's application and making a connection offer.

5.4 DNSPs required to publish an annual network capacity report

DNSPs should publish an annual report identifying areas where capacity constraints exist in the network, which may prevent connections within a defined period, such as 12 months.

PROPOSED CHANGES TO NER	EXISTING PROVISIONS
Require DNSPs to publish annual report identifying capacity constraints in network under Chapter 5.	The AEMC is considering, under National Electricity Amendment (Distribution Network Planning and Expansion Framework) Rule 2011, a requirement that DNSPs be required to publish an Annual Planning Review (APR). In particular, as proposed in the new Rule 5.6.2AA (g), the APR should have regard to projected embedded generating units and their outputs and a wide range of system limitations. This requirement, if adopted, would be sufficient to meet the objectives of this rule change proposal.

The proposed amendments are set out in the Appendix to this rule change proposal.

6. CONTRIBUTION TO THE NATIONAL ENERGY MARKET (NEM) OBJECTIVES: IMPROVING ACCESS FOR EMBEDDED GENERATORS

The proposed rule change contributes to the NEM objective in the following main ways.

6.1 Efficient investment

This rule change proposal is intended to significantly improve the connection process for embedded generators by making it clearer, more consistent across jurisdictions, more certain and more efficient. These improvements will translate into significant savings in terms of time, money and resources for proponents and for DNSPs. The UBC Project identified a number of areas where, as a result of these changes, project proponents and the wider community would benefit.

- **Increasing the clarity, consistency and certainty of the connection process** would reduce the costs currently borne by the project proponent for the design and preparation of the documentation for proposed connection and the management of the connection

application process. In particular, the introduction of an Automatic Access Standard for cogeneration connections is likely to change the nature of the current connection design process from a bespoke process to a more streamlined process. This will reduce design costs, and increase the number of potential projects.

- **Reducing the holding times for new commercial buildings**, where the length of the holding time relates to delays in receiving connection approval for a proposed cogeneration facility, results in lower costs for the developer and lower required rents from the ultimate tenants.
- **Reducing the requirement for re-work and re-design** in the connection application process results in lower costs for the developer and lower required rents from the ultimate tenants.

The DNSPs in the UBC Project explained the process for reviewing connection applications. This related to the need to ensure that the equipment proposed for grid connection is safe, and that the interaction between that equipment, other elements of the grid and other users, is consistent with their obligation to operate the network safely. In establishing an Automatic Access Standard, the first part of that process – considering whether the equipment proposed is safe – will no longer be required to be undertaken by an individual DNSP, with savings to all DNSPs.

Reduced transaction costs will result in increases in static efficiency for current and prospective project proponents and the DNSPs in whose networks the projects will be located. Economy wide, there will be further dynamic efficiency benefits in moving from a bespoke to a more streamlined design process using equipment subject to a common standard across the NEM. In the relatively small market for embedded generation in the NEM, the proposed Automatic Access Standard should significantly reduce an individual proponent's costs, improving the payback to cogeneration installations and encouraging further developments in this market.

6.2 Lower costs and better investment returns

The UBC Project identified areas where project proponents' costs could be significantly reduced as a result of the proposed rule changes including:

- A reduction in the costs associated with designing and preparing an installation and managing the connection application process.
- A reduction in holding times for new commercial buildings, where the length of the holding time relates to delays in receiving connection approval for a proposed cogeneration facility. Commercial property developers involved in the UBC Project estimate that the weekly holding costs for a CBD site are about $50,000 - $70, 000. A Property Council of Australia survey of its Victorian members in 2010 indicated that there were 23 co/trigeneration proposals being considered for implementation in the CBD, Docklands and city fringe areas. Nineteen of the projects identified were expected to proceed in the relatively short term. A saving of one week for each of these projects is a reduction of over $1 million in holding costs alone.
- A reduction in the costs associated with re-work and re-design. One of the UBC Project members quoted a cost of $200,000 in engineering design work to rework the design package in response to changes required by the DNSP.

The benefits of reduced costs flow to consumers directly through reduced costs of construction and lower rents. There are also indirect cost reductions through the potential for a larger and more efficient cogeneration sector to contribute to the electricity system.

6.3 Technology neutrality, adaptation and innovation

The Australian Energy Regulator argues that the National Electricity Market is technology neutral and, in consequence, adaptive to changing market conditions. We agree that these conditions are important to ongoing innovation in consumers' long term interests in the supply of electricity and the performance of the national electricity system. Further, private innovation, including cogeneration and other distributed generation proposals, is an important source of innovation. Policies that reduce unnecessary barriers to private innovation improve the environment for innovation. They also have the potential to provide a source of further dynamic efficiency for the NEM and the broader economy in the long term interest of electricity consumers.

The experience of cogeneration project proponents and many studies commissioned by regulatory bodies suggest that, in practice, changes are needed to the interface between innovative project proponents and the electricity market. This is to effectively enable a technology neutral, adaptive electricity market. The UBC Project participants' experiences demonstrate that even large, well-resourced commercial operations struggle with the current ill-specified requirements of the NER and the jurisdictional requirements.

The rule changes proposed are designed to provide a more streamlined process for proven technologies, and a better defined and more rapid access route for other applications. Consequently, a barrier to private innovation in the supply of electricity may be overcome.

6.4 Emissions reductions and other government policies

Cogeneration is a form of emissions reduction as a result of the substitution of lower emission fuels (gas) for higher emission fuels (principally coal) and the re-use of waste heat. As a response to government policy to encourage the reduction of emissions, the demand for cogeneration is expected to increase. A range of government policies towards the built environment – including the encouragement of higher Green Star ratings for properties leased by government departments and the requirement that NABERS ratings are published for commercial buildings – have the effect of increasing the penetration of cogeneration. In reducing unnecessary barriers to cogeneration connections, the rule change proposal will increase the efficiency with which other government policies relating to energy production and consumption are implemented, improving economy wide efficiency in the long term interest of consumers of electricity.

6.5 Demand side management, security of supply and lower energy infrastructure costs

The rule change proposal will encourage the uptake of embedded generators such as cogeneration. In turn, the use of distributed generation may provide a source of diversification for local supply in the event of a supply side disruption, enhancing the local security of supply. Cogeneration also represents a form of demand side management, with the potential, at high levels of penetration, to reduce the need for costly investment in transmission and distribution infrastructure and to reduce transmission losses. To the extent that the rule change proposal facilitates an increase in cogeneration, and other embedded generators, these benefits may in future be substantial.

7. EXPLANATION OF EXPECTED BENEFITS, COSTS AND IMPACT ON THOSE AFFECTED

The implementation of a standardised process for connecting embedded generators to the national electricity grid may impose an additional burden on DNSPs in the short term. This burden is outweighed by the benefits that will accrue to DNSPs, proponents, consumers of energy and society more generally in the longer term.

The costs

- The DNSPs would be required, where no standardised process currently exists, to develop and publish a process and to ensure that the responsible area of their organisation is sufficiently resourced. This is to ensure that the DNSP is able to meet the required processing deadlines or, in good faith, to seek agreement from the project proponent, to agree to an alternative processing deadline.

- Not all of the initial expense, however, should be regarded as a net cost to the DNSP. Existing processes entail a range of internal costs to the DNSP, some of which are likely to be higher than would be the case in a better defined process because of the extent of interactions required under current processes with project proponents. Further, if, as expected, cogeneration connection applications increase, an efficient DNSP is likely to consider developing its own defined process to manage applications. DNSP participants in the UBC Project indicated that there was some internal movement in their organisations to implement processes to manage current application numbers.

The benefits

- **Reduced transaction costs**: By making the connection process more efficient – improving static efficiency – the transaction costs associated with this process are likely to be significantly less for cogeneration proponents and others. DNSPs' costs associated with the evaluation of particular types of equipment will be reduced as a result of the introduction of a relevant automatic access standard. To the extent that the proposed changes apply more generally to the connection process, they may also facilitate connection between larger generators and DNSPs.

- **Improved project economics**: Clarity around the timeframe, scope of the costs and performance of the cogeneration unit will improve project economics and allow alternative models for the finance and operation of cogeneration to emerge. These innovations may provide the basis for a significant increase in the penetration of cogeneration, increasing dynamic efficiency.

- **Reduced energy consumption and energy costs**: Overall, cogeneration provides an extremely efficient form of energy supply, particularly if all useable waste heat from the electricity generation process is recovered and utilised. Moreover, cogeneration enables energy to be consumed where it is produced, translating into a reduction in energy consumption and, therefore, energy costs. The benefits accrue to the direct customers of the cogeneration project and to electricity consumers more generally.

- **Carbon emissions**: Cogeneration plants typically use natural gas as a fuel source, which produces fewer carbon emissions when combusted than coal – the fuel source that is used for many of Australia's grid-connected power stations. Additionally, the reduction in energy consumption which is made possible through efficient cogeneration means that, overall, emissions will be reduced.

- **Security of supply**: On-site cogeneration can protect site owners and users in cases of grid outages. These may occur, for example, in severe weather events such as extreme heat and extreme cold when demand may exceed supply or in bushfire events or during storm surges when network connections within the grid are temporarily lost.

8. COMPLEMENTARY RULE CHANGE ON CONNECTION CHARGES

This proposal also recommends changes to the Rules seeking clarity on shared costs. In line with the Victorian position under Guideline 15 and, depending on the project size, other jurisdictions should only charge connection costs and not shared network augmentation costs. We understand from the AER's recent draft Guidelines that a rule change is required for this approach to be given effect.

- **This proposal addresses an inefficiency in the current approach to the attribution of costs to connections in the NER.** As has been submitted to the Australian Energy Regulator in its recent consideration of connection costs, the standard attribution of shared network augmentation costs to cogeneration projects is based on a fallacy that only cogeneration projects contribute to network congestion – for example, to higher fault levels – and not other connections. This is incorrect. Even standard connections can contribute to fault level in the network, depending on their size and the sophistication of the electrical equipment at the connection.

- **Further, the current application of shared network augmentation costs – on a "last in, worst dressed" basis – is inequitable**, considering all cogeneration connections to a given network as a class, as it penalises that connection application that requires a marginal augmentation without considering the contribution of previous connections or successfully requiring contributions from future connections to offset the costs initially borne by the project proponent.

- **The current approach to cogeneration connection charging does not materially contribute to the efficiency of the electricity system**, as, for the larger number of cogeneration connections a shared augmentation cost provide no meaningful locational signal. It may be the case that this approach to connections to the transmission network provides a signal for potential generators about preferred locations, but connections to the distribution network tend to be driven by other considerations. Cogeneration developments in the dense meshed networks of the CBDs will be preferred to developments elsewhere, as the demand from tenants for lower emission buildings (and the related ability to pay the required rents) is effectively restricted to CBDs and the city fringe at present. Even if locational differences in the shared network augmentation charge were important in prioritising competing developments in a property owner's portfolio, the facts that the charge is only known at the end of a protracted connection application process and then, in the experience of the UBC Project participants, may be subject to significant change mean that no effective prioritisation can occur.

- **The extent to which charges should be incurred by cogeneration projects is debateable.** A recent paper prepared for the Energy Networks' Association by CSIRO raises the question about the extent to which cogeneration projects raise fault levels and the appropriateness of the requirement for a safety margin. In particular, the CSIRO paper raises the issue about what circumstances, if any, the safety margin might be reduced on a transitory basis. Or, whether the safety margin is appropriately maintained at its maximum level on all and every occasion.

9. APPENDIX

TEXT OF PROPOSED AMENDMENTS
(new text shown in underline, removed text shown in strike-through)

9.1 Insert new clause 5.1.2(ba) in Chapter 5

This new clause entrenches a right on the part of embedded generators (including cogeneration proponents) to require a DNSP to comply with Chapter 5.

(ba) Any person who is an *Embedded Generator* has the right to require a *Network Service Provider* to comply with this Chapter.

9.2 Amend definition of 'Embedded Generator' in Chapter 10

This amendment clarifies that an Embedded Generator is not necessarily a Registered Participant.

Embedded Generator

A *Generator* who owns, operates or controls an *embedded generating unit* and is not necessarily a *Registered Participant*.

9.3 Amend definition of 'Generator' in Chapter 10

This amendment clarifies that a Generator includes an Embedded Generator.

Generator

A person who engages in the activity of owning, controlling or operating a *generating system* that is *connected* to, or who otherwise *supplies* electricity to, a *transmission* or *distribution system* and who is registered by *AEMO* as a *Generator* under Chapter 2 or is an *Embedded Generator* and, for the purposes of Chapter 5, the term includes a person who is required to, or intends to register in that capacity.

9.4 Amend clause 5.1.3(a) in Chapter 5

This amendment confirms that embedded generators should have the opportunity to connect to the network along with other Registered Participants and to export to the grid.

(a) all *Registered Participants* and *Embedded Generators* should have the opportunity to form a *connection* to a *network* and have access to the *network services* provided by the *networks* forming part of the *national grid*, including for the purpose of supplying electricity to the *national grid*;

9.5 Amend clause 5.1.3(b) in Chapter 5

This amendment makes it clear that the minimum terms and conditions that must be included in a connection agreement are those contained in schedule 6.

(b) the terms and conditions on which *connection* to a *network* and provision of *network service* is to be granted are to be set out in commercial agreements on reasonable terms entered into between a *Network Service Provider*, ~~and~~ other *Registered Participants* and *Embedded Generators* and must, at a minimum, include the terms set out in schedule 5.6;

9.6 Amend schedule 5.6 in Chapter 5

This amendment makes reference to a new schedule 5.3b where the minimum access standards for Embedded Generators are to be set out.

The *connection agreements* must contain the specific conditions that have been agreed to for *connection* and access to the *transmission* or *distribution network*, including but not limited to:

(a) details of the *connection point* including the *distribution network* coupling points where appropriate;

(b) *metering* arrangements and adjustments for losses where the point of *metering* is significantly different to the *connection point*;

(c) authorised demand which may be taken or supplied at the *connection point* (under specified conditions);

(c1) details of each *access standard* agreed between the *Network Service Provider* and the *Registered Participant* and all related conditions of agreement resulting from the application of any access provisions contained in schedule 5.1 for *Network Service Providers*, or schedule 5.2 for *Generators*, or schedule 5.3 for *Customers*, or schedule 5.3a for *Market Network Service Providers* or schedule 5.3b for *Embedded Generators*;

(d) *connection service* charges;

(e) payment conditions;

(f) duration and termination conditions of the *connection agreement*;

(g) terms, conditions and *constraints* that have been agreed to for *connection* to the *network* to protect the legitimate interest of the *Network Service Providers* including rights to *disconnect* the *Registered Participant* for breach of commercial undertakings;

(h) details of any agreed standards of *reliability* of *transmission service* or *distribution service* at the *connection points* or within the *network*;

(i) testing intervals for *protection systems* associated with the *connection point*;

(j) agreed protocols for maintenance co-ordination;

(k) where an expected *load*, to be connected to a *network*, has a *peak load* requirement in excess 10 MW, the provision, installation, operation and maintenance of automatic *load* shedding facilities for 60 percent of the *load* at any time; and

(l) terms and conditions of access to the *metering installation* for the *Metering Provider* and access to *metering installations* type 5 and 6 for the *Metering Data Provider*.

9.7 Amend clause 5.1.3(c) in Chapter 5

This amendment makes reference to a new schedule 5.3b where the minimum access standards for Embedded Generators are to be set out.

(c) the technical terms and conditions of *connection agreements* regarding standards of performance must be established at levels at or above the *minimum access standards* set out in schedules 5.1, 5.2, 5.3, ~~and~~ 5.3a and 5.3b, with the objective of ensuring that the *power system* operates securely and reliably and in accordance with the *system standards* set out in schedule 5.1a;

9.8 Insert new schedule 5.3b in Chapter 5

TO BE INSERTED ONCE STANDARD DEVELOPED

9.9 Insert new clauses 5.1.3 (ca) and 5.1.3(cb) in Chapter 5

This new clause sets out additional principles applicable to the connection process.

(ca) Each party must act in good faith in relation to *connection* to a *network*;

(cb) Each party must provide the other with information the other reasonably requires in order to facilitate *connection* to the *network*;

9.10 Amend clause 5.1.3(d) in Chapter 5

This amendment confirms that embedded generators may request connection below the automatic access standard provided that this does not affect power system security and the quality of supply to other Network Users.

(d) a *Registered Participant*, ~~or~~ person intending to become a *Registered Participant*, or *Embedded Generator* may request *connection* of a facility, modification of a *connection*, or alteration of *connected plant* at a standard below an *automatic access standard* if the *connection*, modification to the *connection*, or alteration of *connected plant* does not adversely affect:

(1) *power system security*; and

(2) the quality of *supply* to other *Network Users*;

9.11 Amend clause 5.3.1(b) in Chapter 5

This amendment confirms that connection of Embedded Generators must follow the rules set out in clause 5.3.

(b) A *Registered Participant*, *Embedded Generator* or person intending to become a *Registered Participant* who wishes to establish a *connection* to a *network* must follow the procedures in this rule 5.3.

9.12 Insert new clause 5.3.1A in Chapter 5

This new clause identifies the information that the Network Service Provider must make public to facilitate the connection process.

5.3.1A Publication of Information

(a) A Network Service Provider must publish on its website the following:

(i) an application form for a new *connection* to the *network* or an alteration of an existing *connection* to the *network*;

(ii) the fee applicable to *connect* to the *network*, including the fee to process the application to connection;

(iii) a description of how an application for a new *connection* or a *connection* alteration is to be made (including a statement of the information required for the application);

(iv) a description of the *connection* process;

(v) an identification of the information that must be submitted with an *application to connect*; and

(vi) the basis for calculation of *connection* charges.

(b) A Network Service Provider must annually publish on its website any network constraints that could affect *connection* to the *network*.

9.13 Amend clause 5.3.3(b4) in Chapter 5

This amendment ensures that, where appropriate, Embedded Generators are consulted in the development of connection standards.

(b4) In making a determination in accordance with clause 5.3.3(b2) the *Reliability Panel* must consult *Registered Participants, AEMO* and, where appropriate, *Embedded Generators*, using the *Rules consultation procedures*.

9.14 Amend clause 5.3.3(b)(6) in Chapter 5

This amendment ensures that the preliminary program includes the timeline within which the Network Service Provider must decide whether or not to accept an application to connect.

(6) a *preliminary program* showing proposed milestones for *connection* and access activities, including the time by which the Network Service Provider must make an offer to connect or reject a connection application, which may be modified from time to time by agreement of the parties, where such agreement must not be unreasonably withheld.; and

9.15 Add new clause 5.3.3(b)(7) in Chapter 5

This amendment makes it clear that the Network Service Provider must provide a Connection Applicant with details of the fee applicable to process the application to connect.

(7) the fee applicable to *connect* to the *network*, including the fee to process the *application to connect*.

9.16 Amend clause 5.3.3(c) in Chapter 5

This amendment ensures that the Network Service Provider can only require additional information in relation to the connection application where this is reasonably necessary.

(c) Within 20 *business days* after receipt of the *connection* enquiry and all such additional information (if any) advised under clause 5.3.2(b) or, if the *Connection Applicant* has requested the *Local Network Service Provider* to process the *connection* enquiry under clause 5.3.2(d), within 20 *business days* after receipt of that request, the *Network Service Provider* must provide to the *Connection Applicant* written advice of all further information which the *Connection Applicant* must prepare and obtain in conjunction with the *Network Service Provider* to enable the *Network Service Provider* to assess an *application to connect* to the extent that the information has not already been provided by the *Connection Applicant* and the information is reasonably necessary to assess the *application to connect* including: …

9.17 Amend clause 5.3.6(a1) in Chapter 5

This amendment sets limits on the additional time within which the Network Service Provider must decide whether or not to accept an application to connect.

(a1) The *Network Service Provider* may amend the time period referred to in clause 5.3.6(a) to allow for any additional time taken in excess of the period allowed in the *preliminary program* for the negotiation of *negotiated access standards* in accordance with clause 5.3.4A but this time period must be within 65 working days from the receipt of the *application to connect* in all cases.

9.18 Amend clause 5.3.6(b) in Chapter 5

This requires the Network Service Provider to include details of the connection charges in the offer to connect.

(b) The offer to *connect* must contain the proposed terms and conditions for *connection* to the *network* including:

(1) for each technical requirement identified by the *Network Service Provider* under clause 5.3.3(b1), the *automatic access standard* or the *negotiated access standard* as determined in accordance with clauses 5.3.4 and 5.3.4A; ~~and~~

(2) the terms and conditions of the kind set out in schedule 5.6~~.~~;

(3) an itemised statement of connection costs including (so far as is relevant) the following:

(i) standard connection charges;

(ii) meter type and cost;

(iii) cost of system extension;

(iv) details of upstream augmentation required to provide the connection service and associated cost;

(v) any other incidental costs and the basis of their calculation;

and must be capable of acceptance by the *Connection Applicant* so as to constitute a *connection agreement*.

9.19 Amend clause 5.3.6(c) in Chapter 5

This amendment makes reference to a new schedule 5.3b where the minimum access standards for Embedded Generators are to be set out. An offer to connect must be consistent with these standards.

(c) The offer to *connect* must be fair and reasonable and must be consistent with the safe and *reliable* operation of the *power system* in accordance with the *Rules*. Without limitation, unless the parties otherwise agree, to be fair and reasonable an offer to *connect* must offer *connection* and *network services* consistent with schedule 5.1 and (as applicable) schedules 5.2, 5.3, ~~and~~ 5.3a and 5.3b and must not impose conditions on the *Connection Applicant* which are more onerous than those contemplated in schedules 5.1, 5.2, 5.3, ~~or~~ 5.3a or 5.3b.

9.20 Amend clause 5.3.7(b) in Chapter 5

This amendment makes reference to a new schedule 5.3b where the minimum access standards for Embedded Generators are to be set out. The connection agreement must be consistent with these standards.

(b) The *connection agreement* must include proposed *performance standards* with respect to each of the technical requirements identified in schedules 5.2, 5.3, ~~and~~ 5.3a and 5.3b and each proposed *performance standard* must have been established in accordance with the relevant technical requirement.

9.21 Insert new clauses 5.5(da) and 5.5(db) in Chapter 5

This new clause makes it clear that a Distribution Network Service Provider must ensure that the network is able to receive a supply of electricity from an Embedded Generator.

(da) An *Embedded Generator* may seek *connection* to *distribution networks* for the supply of electricity to the *national grid*.

(db) A *Distribution Network Service Provider* must ensure that its *distribution network* is able to receive the supply of electricity from an *Embedded Generator*.

9.22 Amend clause 5.5(f)(3) in Chapter 5

This amendment makes it clear that a Distribution Network Service Provider can only charge an Embedded Generator for shallow augmentation costs.

(i) by the *Connection Applicant,* other than *Embedded Generators*, in relation to any *augmentations* or *extensions* required to be undertaken on all affected *transmission networks* and *distribution networks*; ~~and~~

(ii) where the *Connection Applicant* is a *Market Network Service Provider*, to the *Market Network Service Provider* in respect of any reduction in the long run marginal cost of *augmenting* the *distribution network* as a result of it being *connected* to the *distribution network*~~.~~; and

(iii) by the *Connection Applicant*, where the *Connection Applicant* is an *Embedded Generator*, in relation to any *augmentations*, other than shared network augmentation, required to be undertaken on all affected *networks*.