2nd September 2020

Mr Ben Barr
Chief Executive
Australian Energy Market Commission
Level 15, 60 Castlereagh Street
Sydney NSW 2000

Re: Rule change request – Conditional exemption from registration for new embedded generators between 5-30MW

Dear Mr Barr,

Please find attached a rule change request which seeks to amend the National Electricity Rules (NER) to remove ambiguities in the connection process for new embedded generators with nameplate capacity between 5-30 MW which intend to be exempt from the requirement to register as a generator with AEMO.

Embedded generating systems of this size are typically co-located with load and connected to a distribution network (at voltages typically less than 66 kV). Such facilities include universities, industrial & processing facilities, warehouses, airports, hospitals and prisons. Owning and operating an embedded generating system as a Registered Participant under the NER is typically not desirable for these businesses. Reasons vary, but in my experience the impacts to current retail electricity agreements combined with the fact that such business's primary purpose is not to operate a power station are common. Instead, these customers simply wish to offset their electricity usage in a similar fashion to a residential household with rooftop solar PV. As such, the connection applicant typically wishes to be exempt from the requirement to register with AEMO as a generator as per clause 2.2.1(c) of the NER.

Unfortunately, the current version of the NER (v144 at time of writing):

- Requires an exemption from the requirement to register as a generator to be obtained very late in the project process, usually after the procurement of generating equipment and often post connection agreement execution, which passes significant risk to the connection applicant; and
- Is ambiguous and unclear on what connection pathway is applicable. This causes confusion on obligations and applicable technical standards which, in my experience, have negatively impacted project budget and schedule for these connection applicants.

The above points collectively prevent efficient investment in generation co-located with large, distribution connected load. These barriers prevent these customers from achieving a reduction in their electricity costs and an associated carbon offset, which is not in the best long-term interest of these consumers of electricity and thus is in direct opposition to the National Electricity Objective (NEO).

This rule change request seeks to amend the NER to reclassify embedded generators with nameplate capacity between 5-30 MW as eligible to connect under Chapter 5A of the NER. This is proposed by modifying clause 2.2.1 of the NER to require AEMO provide a mechanism for a connection applicant of a proposed 5-30 MW generating system to achieve 'conditional' exemption from the requirement to register as a generator, subject to (for example) successful negotiation of technical performance standards with the Connecting NSP. This allows a connection applicant to have confidence that their project will be exempt from registration, as well as giving the connecting generating system a 'non-registered' classification under the NER – this in turn will enable efficient investment in generation co-located with large, distribution connected load and thus aligning the NER with the NEO in this regard.

I look forward to working with the Commission to progress this request.

Kind Regards,

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1 – The Current Process & Ambiguity

1.1 – Clause 2.2.1 & Exemption

Section 11(1)(a) of the NEL requires any person engaging in the activity of owning, controlling or operating a generating system in the NEM to register as a Generator.

Clause 2.2.1(c) of the NER enables AEMO, subject to guidelines they issue and control, exempt a person or class of persons from the requirement to register as a generator as per Section 11(1)(b) of the NEL.

2.2 Generator

2.2.1 Registration as a Generator

(a) Subject to clause 2.2.1(c), a person must not engage in the activity of owning, controlling or operating a *generating system* that is *connected* to a *transmission or distribution system* unless that person is registered by *AEMO* as a *Generator*.

(b) **[Deleted]**

(c) *AEMO* may, in accordance with guidelines issued from time to time by *AEMO*, exempt a person or class of persons from the requirement to register as a *Generator*, subject to such conditions as *AEMO* deems appropriate, where (in *AEMO's* opinion) an exemption is not inconsistent with the *national electricity objective*.

Figure 1: Extract from rule 2.2 of the NER (v144 at time of writing)

Under this clause, AEMO has published the *Guide to generator exemptions and classification of generating units*[1]. Two of these exemption categories are relevant to this discussion paper and are copied below.

Generator Nameplate	Exemption?	Must apply for exemption?
< 5 MW	"Automatically exempt from the requirement to register as a Generator in relation to that activity"	No
5-30 MW	"AEMO may grant the exemption in its absolute discretion or subject to any conditions it considers appropriate."	Yes

A summary of the published exemption criteria for generators with a combined nameplate value between 5-30 MW generators is as follows (summarised from the same reference as above, correct as of time of writing):

- One of the following:
  a. Expected to export less than 20 GWh / year; or
  b. Extenuating circumstances apply, cannot reasonably register as a generator.
- If there is any potential to export energy:
  a. Sent out generation purchased in its entirety by a market participant; or
  b. Registered as part of a Small Generator Aggregator.
- One of the following:
  a. A copy of the performance standards as agreed with the Connecting NSP; or
  b. A letter from the Connecting NSP stating that the generating system is intended for use in a manner the NSP considers is unlikely to cause a material degradation in the quality of supply to other network users.

1.2 - Connection Pathway for Generating Systems <5 MW

Generators with a proposed nameplate < 5 MW are subject to an automatic standing exemption and per the above. As such, assuming the generator does not wish to become a Registered Participant, there is:

- No doubt that the generator is a non-registered exempt generator[2] for both the connection applicant and Connecting NSP and;

[1] Sections 3.2 & 3.3 of "*AEMO Guide to generator exemptions and classification of generating units v4.0*" available at https://aemo.com.au/-/media/files/electricity/nem/participant_information/new-participants/generator-exemption-and-classification-guide.pdf?la=en

[2] As per the definition in clause 5A.A.1 of the NER "*means an embedded generator that is neither a micro embedded generator nor a Registered Participant.*"

- No risk to the *connection applicant* that the generating system will not be exempt from the requirement to register as a generator (due to the automatic standing exemption).

As per the table in clause 5.1.2(b) (Figure 2), generators of this size who do not wish to become a Registered Participant typically connect under Chapter 5A of the NER.

A *load connecting* to a *distribution network* where the *Connection Applicant* is not a *Registered Participant* and is not intending to become a *Registered Participant* (unless it is acting as the agent of a *retail customer*) A non-registered embedded generator who does not make an election for Rule 5.3A to apply instead of Chapter 5A	Chapter 5A applies

Figure 2: Extract from clause 5.1.2(b) of the NER (v144 at time of writing)

1.3 - Connection Pathway for Generating Systems 5-30 MW

The remainder of this discussion paper will focus on generating systems which could be informally defined as 'intending exempt participants' which meet the following criteria:

- Is an (future, not yet connected) embedded generator;
- With a proposed nameplate between 5-30 MW;
- Believe they meet the exemption from registration criteria as stipulated by AEMO; and
- Is not intending to become a Registered Participant.

As per Section 1.1, there is no automatic exemption from the requirement to register as a generator for such generating systems.

As an exemption must be applied for, it is unclear if 'intending exempt participants' are defined as a non-registered embedded generator prior to being in receipt of this application as per clause 5A.A.1 of the NER. The author's interpretation of the NER is that all generators are treated as Registered Participants unless exemption is granted in line with Clause 2.2.1(a) (Figure 1). However, this is unclear and not clearly stipulated in the NER.

As per the exemption criteria in Section 1.1 above, an 'intending exempt participant' must submit a copy of the performance standards which have been agreed with the Connecting NSP. This typically isn't agreed until the connection process is nearing completion, thereby requiring an 'intending exempt participant' start a connection process with their Connecting NSP prior to being confirmed as 'non-registered'.

However, the connection pathway the *connection applicant* should take is unclear.

- Chapter 5.3 is for Registered Participants, of which the 'intending exempt participant' does not wish to be;
- Chapter 5A is for 'non-registered embedded generators'. The 'intending exempt participant' does not have an exemption at this stage in the connection process, so it is unclear if it could be defined as 'non-registered'; and
- Chapter 5.3A appears to be written in such a way as to be applicable in this instance (see Figure 3). However, as per clause 5.1.2(b) (Figure 4) it is applicable to a '*non-registered embedded generator who makes an election for 5.3A to apply instead of Chapter 5A*.' But at this stage of the connection process, as per above, it is unclear if it could be defined as 'non-registered'.

5.3A Establishing or modifying connection - embedded generation

5.3A.1 Application of rule 5.3A

(a) For the purposes of this rule 5.3A:

non-registered embedded generator has the same meaning as in clause 5A.A.1

(b) Where a *Connection Applicant* wishes to connect an *embedded generating unit*, this rule 5.3A applies.

(c) For the purposes of this rule 5.3A and Schedules 5.4A and 5.4B:

(1) a reference to a *Connection Applicant* is to a:

(i) person who intends to be an *Embedded Generator*;

(ii) person who is required to apply to *AEMO* for an exemption from the requirement to register as a *Generator* in respect of an *embedded generating unit*; or

(iii) non-registered embedded generator who has made an election under clause 5A.A.2(c),

and who makes a *connection* enquiry under clause 5.3A.5 or an *application to connect* under clause 5.3A.9 in relation to any *generating systems*, or any *network elements* used in the provision of a *network service*, as the case may be.

Figure 3: Extract of rule 5.3A of the NER (v144 at time of writing) which appears to match the criteria of an 'intending exempt participant.'

A non-registered embedded generator who makes an election for rule 5.3A to apply instead of Chapter 5A	Rules 5.3 and 5.3A apply (see clause 5.3.1A for the interaction between the two rules)

Figure 4: Extract from clause 5.1.2(b) of the NER (v144 at time of writing) implying that only 'non-registered embedded generators' can progress a rule 5.3A connection.

Due to the confusion on connection pathways, the obligations of the connection applicant and the Connecting NSP are unclear which results in connection delays and misunderstandings in responsibilities, timeframes and level of expected detail.

Further to this, an 'intending exempt participant' can only submit the exemption to register as a generator very late in the project's development, once technical requirements are agreed with the Connecting NSP and usually once connection agreements are executed. This passes significant risk to the connection applicant (for example in the event the exemption is refused).

Recent project experience from the author includes:

- An example of a generator (5-30 MW) who was successful in receiving an exemption only 10 business days prior to generating system commissioning. All generating equipment had been purchased and was installed on site by the time an exemption was issued;
- An example of a generator (5-30 MW) who was asked to provide generator nameplate photos prior to finalising the exemption, which means the connection applicant had to have procured the equipment by this stage.

In summary:

- The connection pathway for embedded generators (5-30 MW nameplate) who intend to be exempt from the requirement to register as a generator is unclear;
- The documentation and evidence required to formalise an exemption with AEMO requires a project to be in the final stages of the connection application, therefore posing a significant risk to the connection applicant in case AEMO does not grant an exemption (noting it has "absolute discretion"[3] in this matter).
- There (to the author's reading) is no clear statement in the NER as to if Chapter 5A does or does not apply to such generators.

The latter point is unfortunate, as the negotiated connection pathway (Part C of Chapter 5A) is, in the author's opinion, well suited for progressing these often unique generator connections compared to the structure and

[3] Section 3.3.2 of "*AEMO Guide to generator exemptions and classification of generating units v4.0*" available at https://aemo.com.au/-/media/files/electricity/nem/participant_information/new-participants/generator-exemption-and-classification-guide.pdf?la=en

rigour of Chapter 5.3 or 5.3A which leaves little room for negotiation outside of the fixed technical framework of Schedule 5.2.

1.4 - Survey of NSP Connection Documentation

A survey of the connection documentation for a sample of the Distribution Network Service Providers (DNSPs) within the NEM was completed to highlight ambiguities in relation to the discussion above.

The following is not intended to highlight any errors or omissions in any single DNSP's connection documentation, but instead highlight the confusion and ambiguity faced by an 'intending exempt participant' (that is, 5-30 MW embedded generating system who intends to be exempt from the requirement to register as a generator).

DNSP	Quote	Pathway	Reference
Essential Energy	"Embedded generation… greater than 5MW or if you are seeking an exemption from becoming a Registered Participant refer to NER Chapter 5"	Chapter 5	[4]
United Energy	"HV EG Negotiated Connection - Negotiated connection application process [follows] Chapter 5A [of the NER]"	Chapter 5A	[5]
CitiPower / Powercor	"Customers wishing to connect an embedded generator with capacity less than 5MW and not electing to go through the NER Chapter 5 process are subject to this [Chapter 5A] process"	Unclear	[6]
Energex	">= 5 MW… [default connection process is] Chapter 5 of the NER"	Chapter 5	[7]
Jemena	"Chapter 5 of the NER applies to embedded generators that do not have a standing exemption for registration from AEMO. Currently, the standing exemption limit is set at 5 MW and as such the processes described in this document apply to embedded generators greater than 5 MW in size"	Chapter 5	[8]
AusNet Services	"The intention of this guideline is to cover the connection of Embedded Generators that are registered by AEMO to the AusNet Services distribution network. It also applies to Embedded Generators that are required to, or intend to register with AEMO."	Unclear	[9]
Ausgrid	"This guideline applies to embedded generator (EG) connections that will follow the connection process regulated by Chapter 5A of the National Electricity Rules (NER), excluding those defined as micro-embedded generators. This process generally applies to generators with a capacity ranging from 30kW to 5MW that will not be registered with the Australian Energy Market Operator (AEMO)."	Unclear	[10]

[4] Section 1 (Introduction) of "*CEOP8079 - Connection Process Guideline - Negotiated High Voltage Retail Customer Connections and Embedded Generators*" available at http://documents.essentialenergy.com.au/CEOP8079.pdf
[5] Section 5 (EG Connection Application Process) of "*Embedded Generation Customer Connection Procedure*" available at https://www.unitedenergy.com.au/wp-content/uploads/2020/03/UE-PR-2008-EG-Customer-Connection-Procedure.pdf
[6] Section 5.2 (Non-registered Embedded Generators) of "*CUSTOMER GUIDELINE - High Voltage Distribution Connected Embedded Generation*" available at https://media.powercor.com.au/wp-content/uploads/2019/09/23142527/Customer-Guidelines-High-Voltage-Distribution-Connected-Embedded-Gener …pdf
[7] Section 5.4 / Table 2 (Connection categories) of "*Standard for Connection of Embedded Generating Systems to a Distributor's HV Network*" available at https://www.energex.com.au/ data/assets/pdf_file/0007/671830/STNW1175-Connection-of-EG-Systems-to-an-HV-Network.pdf
[8] Section 1 (Introduction) of "*Embedded Generation - Description of Connection Process - 5 MW or Greater ELE PR 0007*" available at https://jemena.com.au/getattachment/33ad9ea0-945e-48da-85a6-cc7a7734f2bd/Large-Embedded-Generation-Description-of-Connectio.aspx
[9] Section 1 (Introduction and purpose) of "*Guidelines for the Connection of Embedded Generators of 5 MW or Greater*" available at https://www.ausnetservices.com.au/-/media/Files/AusNet/New-Connections/Embedded-Generation-greater-than-5-MW/2020/Embedded-Generation-Gudelines-SOP-33-05_Issue-4--Jan-2020.ashx?la=en
[10] Section 1 (Introduction) of "*Non-Registered Embedded Generators Guideline*" available at https://www.ausgrid.com.au/-/media/Documents/Connections/Embedded-Gen/Non-Registered-Embedded-Generators-Guideline.pdf

DNSP	Quote	Pathway	Reference
Tas Networks	"In order to obtain approval to physically connect to the power system, generation proponents must follow the connection process as detailed in Chapter 5 of the NER… In accordance with Appendix 6 of AEMO's "NEM Generator Registration Guide", generation proponents may seek a registration exemption from AEMO... For generating systems in excess of 5 MW that have sought and been granted exemption from registration, TasNetworks generally considers it appropriate to apply the access standards provided in Schedule 5.2.5 of the NER."	Chapter 5	[11]
Ergon Energy	"The below information is an overview of the steps involved in connecting a Registered (or to-be Registered) EG system, or a Non-Registered EG that either doesn't have the benefit of the standing exemption or which has elected under rule 5A.A.2(c) of the NER to use this Part B process, to connect to Ergon Energy's distribution network. … As mentioned above, these EG systems are typically larger than 5 MW, although this varies depending upon the particular EG system. Rule 5.3A under Chapter 5 of the NER sets out the connection process for the connection of such EG systems"	Chapter 5A or 5.3A	[12]
Evoenergy	"An Inverter Energy System (IES) or non-IES network connection for which the EG system: a) Is not required to be, or is exempt from, being registered in the National Electricity Market b) Typically has a system capacity of less than 5 MW … These technical requirements will form the basis for High Voltage Embedded Generators that are registered within the National Electricity Market."	Unclear	[13]
SA Power Networks	"The following process applies to all embedded generation enquiries greater than or equal to 5MW irrespective of the generating technology. All such generating system connection enquiries shall follow the process detailed within Chapter 5 of the NER. Such embedded generating system connections will be subject to registration with AEMO and will therefore incur additional modelling and analysis requirements, and charges. Depending on the size and/or location of the proposal, additional requirements may be imposed by the likes of ESCOSA, OTR and ElectraNet. … Where registration with (or exemption from) AEMO is required, evidence of either shall be provided to SA Power Networks prior to connection to the network."	Chapter 5	[14]

[11] Section 1 (Overview) of "*Technical Requirements for the Connection of Embedded Generat*ion" available at https://www.tasnetworks.com.au/config/getattachment/d34af7f2-7641-49fa-a388-ff1df3e89ba3/Embedded-Generation-Technical-Requirements.pdf
[12] Part B (Connection Process for EG Systems > 5 MW Overview) of "*2019-20 Embedded Generation Information Pack*" available at https://www.ergon.com.au/ data/assets/pdf_file/0007/220939/Embedded-Generation-Info-Pack-2019-20.pdf
[13] Section 1.2 (Scope and Purpose) of "*Evoenergy High Voltage Embedded Generation Technical Requirement*s" available at https://www.evoenergy.com.au/-/media/evoenergy/documents/emerging-technology/sm5063-evoenergy-hv-embedded-generation-technical-requirements.pdf
[14] Section 6 (General Enquiries ≥ 5MW) & Section 9.2 (AEMO Registration) of "*NICC270 Connection of Large Embedded Generation*" available at https://www.sapowernetworks.com.au/public/download.jsp?id=9685

DNSP	Quote	Pathway	Reference
Endeavour Energy	"These application guidelines provide details of the application process for embedded generators 5MW or greater seeking to connect to the Endeavour Energy network. AEMO has issued a standing exemption from registration for generation systems with a nameplate rating of less than 5MW as detailed in the AEMO publication NEM generation registration guide. … Exempt embedded generators will need to refer to the Endeavour Energy website which contains a section on 'small and medium embedded non-registered generator connection services'."	Unclear	[15]

The vast majority of NSPs document the connection pathway for a 5-30 MW embedded generator is a Chapter 5 pathway (which the author has interpreted as Chapter 5.3), with only Ergon Energy's embedded generator documentation clearly referencing Chapter 5.3A of the NER as per the reference in the table above.

Thus, according to the NSP connection documentation surveyed, it appears that Chapter 5.3 is the industry's assumed connection process for all generators > 5 MW, irrespective of registration intentions.

1.5 - Ambiguities caused by Chapter 5 connection & technical standards

As described in Section 1.2 above, 'intending exempt participants' are not Registered Participants nor intend to become Registered Participants which creates ambiguities and confusion during the connection process.

For example, Schedule 5.5 (Figure 5) can be read as not being applicable to such a connection applicant, which causes confusion in relation to the connection applicant's obligations regarding supply of power system models and technical data.

Schedule 5.5 Technical Details to Support Application for Connection and Connection Agreement

S5.5.1 Introduction to the schedule

Various sections of the *Rules* require that *Registered Participants* submit technical data to the *Network Service Provider*. This schedule lists the range of data which may be required. The actual data required will be advised by the *Network Service Provider*, and will form part of the technical specification in the *connection agreement*. These data will also be made available to *AEMO* and to other *Network Service Providers* by the *Network Service Provider* at the appropriate time.

Figure 5: Extract from S5.5 of the NER (v144 at time of writing) which implies that exempt generators do not have to comply with S5.5 of the NER, as they are not Registered Participants.

Significant confusion is created in relation to Generator technical Performance Standards (GPS). Schedule 5.2.1(b)(1) (Figure 6) states that the schedule does not apply to generating systems exempt or eligible to be exempt under 2.2.1(c) of the NER.

Note at this stage of the connection process, the connection applicant believes they are eligible, but no formal exemption application can be received at this stage in the project development.

[15] Section 1.0 (Overview) of "Emb*edded generators 5MW and greater - Application guidelines*" available at https://www.endeavourenergy.com.au/wps/wcm/connect/1c856660-0b04-46e1-90cb-9b06eea75a31/Embedded+generators+5MW+and+greater+guidelines+_Final.pdf

Schedule 5.2 Conditions for Connection of Generators

S5.2.1 Outline of requirements

(a) This schedule sets out details of additional requirements and conditions that *Generators* must satisfy as a condition of *connection* of a *generating system* to the *power system*.

(b) This schedule does not apply to any *generating system* that is:

(1) subject to an exemption from registration under clause 2.2.1(c); or

(2) eligible for exemption under any guidelines issued under clause 2.2.1(c),

and which 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*.

Figure 6: Extract of S5.2 of the NER (v144 at time of writing) confirming that Schedule 5.2 (thereby including Schedule 5.2.5) does not apply to any generators eligible for exemption under clause 2.2.1(c).

However, this does not align with the following documentation:

Example	Reference
AEMO's *Guide to generator exemptions and classification of generating units* **3.3.3. Compliance with technical requirements** Persons eligible for exemption from the requirement to register as a *Generator* under section 3.3.2 are not automatically exempt from the requirement to comply with the technical requirements in Schedule 5.2 of the NER. Hence, when applying for an exemption, applicants will also need to provide to AEMO: (a) a copy of the *performance standards* agreed with their connecting NSP; or (b) a letter from their connecting NSP stating that their *generating system* is intended for use in a manner the NSP considers is unlikely to cause a material degradation in the quality of *supply* to other *Network Users*.	16
TasNetwork's Guideline *Technical Requirements for the Connection of Embedded Generation* For *generating systems* in excess of 5 MW that have sought and been granted exemption from registration, TasNetworks generally considers it appropriate to apply the *access standards* provided in Schedule 5.2.5 of the NER. Where the wording of *access standards* preclude their direct application to embedded generation, or are simply not appropriate, alternative descriptions have to be provided. As a result, variations to Schedule 5.2.5 are described in this document.	17
Detailed connection response documentation for a 5-30 MW intending exempt generator (generator name redacted) [redacted] is intending to [redacted] being exempted to be registered as Generator with the new addition of [redacted] Solar PV System. **2.1.1 Proposed Access Standards** In order to assist [redacted] to prepare the requirement for access standard for its connection application, [redacted] has prepared a table with a list of proposed access standards in reference to NER clause S5.2, noting that Table 2–1 is inclusive but not an exhaustive list of requirement.	N/A
Response from AEMO on an exemption application (generator name redacted) querying if Schedule 5.2 of the NER applies for the generator. *9. Noting that you have provided a letter from their NSP stating that the Generating System is intended for a use in a manner that the NSP considers is unlikely to cause a material degradation in the quality of supply to other Network Users, please also provide confirmation from the NSP to advise:* • *Does schedule 5.2 apply? It's not clear from the NSP letter (Attachment 4)* • *Is the NSP accept unity pf for the generating system?*	N/A

As per the above, *AEMO* require that Schedule 5.2 applies (for the purposes of their exemption review) which:

[16] Section 3.3.3 of "*AEMO Guide to generator exemptions and classification of generating units v4.0*" available at https://aemo.com.au/-/media/files/electricity/nem/participant_information/new-participants/generator-exemption-and-classification-guide.pdf?la=en

[17] Section 1 (Overview) of "*Technical Requirements for the Connection of Embedded Generation*" available at https://www.tasnetworks.com.au/config/getattachment/d34af7f2-7641-49fa-a388-ff1df3e89ba3/Embedded-Generation-Technical-Requirements.pdf

- Places a significant burden on the connection applicant, which may not be reasonable given the size of the generating system (i.e. same performance is expected from a 10 MW solar farm as a 200 MW solar farm) and;
- Requires the Connecting NSP and AEMO to (during the 5.3.4A technical standards negotiation process) accept performance standards below the minimum access standard because of the inability of the 5-30 MW intending exempt generator to comply.

For example, the following access standards cannot be met by 5-30 MW 'intending exempt participants':

1. S5.2.5.11 Frequency Control - Cannot comply with automatic access standard as requirement is for "*measurable amounts of all market ancillary services*" which the generator cannot participate in due to its exempt status (cannot participate in ancillary services market);
2. S5.2.5.14 Active Power Control - Cannot comply with minimum access standards as performance is broken down by generator classification, but the generator does not receive a classification due to its exempt status[18];
3. S5.2.6.1 Remote Monitoring - Same as per S5.2.5.14.

If the NSP and AEMO accept these performance standards, this is a breach of 5.3.4A(b)(1) of the NER which can cause further confusion and delay.

To be clear - the intent of this discussion paper is not to request the Commission to remove all technical requirements on 5-30 MW embedded generators who intent to be exempt from the requirement to register, but instead to clarify the pathway and technical requirements that apply.

1.6 - Summary

In summary, the current version of the NER (v144 at time of writing), for connection applicants of a generating system of nameplate 5-30 MW whom wishes to be exempt from the requirement to register as a generator:

- Requires an exemption to be obtained very late in the project process, usually post equipment procurement and often post connection agreement execution, which passes significant risk to the connection applicant (for example in the event the exemption is refused or is approved subject to conditions which were unforeseen requiring additional investment and delay); and
- Is ambiguous and unclear on what connection pathway is applicable. This causes confusion on obligations and applicable technical standards which in the author's experience causes delays and additional cost.

The above points collectively do not encourage efficient investment in generation co-located with large, distribution connected load. These barriers prevent these customers from achieving a reduction in their electricity costs and an associated carbon offset, which is not in the best long-term interest of these consumers of electricity and thus is in direct opposition to the NEO.

[18] As per clause 2.2.1(g) of the NER.

2 - Proposed Amendment

2.1 - Background on previous rule changes

The final determination of rule change request ERC0147 (Connecting embedded generators, which created the Chapter 5A connection pathway) did briefly discuss generators with nameplates greater than 5 MW (see Figure 7) but only considered registered embedded generators, not generators which intend to be exempt from registration[19].

5.6.2 Application of the draft rule to registered embedded generators

Many stakeholders focussed on the draft rule's impact on embedded generators less than 5MW. However, a few made comments in regard to embedded generators greater than 5MW.

Fotowatio Renewable Ventures (FRV) noted that the scope of draft clause 5.3.1 captures all embedded generators, including registered embedded generators.[61] FRV considered that draft clause 5.1.2(b) provided non-registered generators with the ability to opt-in to, and elect to be connected under Chapter 5, rather than Chapter 5A.[62] FRV considered that the proposed connection process did not enhance the certainty, transparency or economic efficiency of the current connection process for registered embedded generators. Therefore, in its view, the scope of the draft rule should be limited to non-registered embedded generators which should be addressed with changes to Chapter 5A, not Chapter 5, of the NER.[63]

Figure 7: Extract from the Commission's final determination on rule change ERC0147.

However, the ERC0147 consultation paper[20] (Figure 8) clearly documents the Commission's intention to allow 5-30 MW intending exempt generators to connect under Chapter 5A of the NER, subject to them being in receipt of an exemption.

There is a clear disconnect between the Commission's opinion, the connection documentation supplied by DNSPs and the current version of the NER.

Table 5.1 Provisions under Chapter 5 and Chapter 5A of the NER

Type of installation	Registration requirements	Chapter 5 (connection process and technical requirements)	Chapter 5A
Less than 5MW	Exempt from registration	Chapter 5 provisions do not automatically apply. However, any person can require the network service provider to comply with Chapter 5 and/or elect to use the connection process. Otherwise, jurisdictional processes apply. (Once Chapter 5A has been implemented, a connection applicant can choose between Chapter 5 and Chapter 5A). Jurisdictional technical standards apply.	Chapter 5A applies. Under Chapter 5A distributors must develop 'model standing offers' to apply for 'micro embedded generators', which are typically installations up to 10kW.
5MW to 30MW	Can apply to AEMO for exemption to register as a market participant	If exempt from registration, same provisions as above. (Once Chapter 5A has been implemented, a connection applicant that is exempt from registration can choose between Chapter 5 and Chapter 5A). Chapter 5 provisions apply if registered as a market participant.	Chapter 5A would apply for non-registered embedded generators.

Figure 8: Extract from the Commission's ERC0147 consultation paper, implying the intention is for 5-30 MW generators to connect under Chapter 5A of the NER.

2.2 - Amendment 1 - Conditional Exemption (Chapter 2)

[19] Section 5.6.2 (Application of the draft rule to registered embedded generators) of "*RULE DETERMINATION National Electricity Amendment (Connecting Embedded Generators) Rule 2014*" available at https://www.aemc.gov.au/sites/default/files/content/cc84500c-9c38-4ac4-8633-991efa01547c/Connecting-embedded-generators-Final-rule-determination.pdf

[20] Table 5.1 (Provisions under Chapter 5 and Chapter 5A of the NER) of "*CONSULTATION PAPER National Electricity Amendment (Connecting embedded generators) Rule 20*12" available at https://www.aemc.gov.au/sites/default/files/content/6d909057-91dc-4f49-8e4e-6bbc3bd59eaf/Consultation-paper.PDF

As discussed in Section 2.1, the author agrees with the Commission that Chapter 5A of the NER is the best suited connection pathway for non-registered embedded generation (both <5 MW and 5-30 MW).

However, the current exemption process as per clause 2.2.1(c) of the NER presents a 'chicken-and-egg' problem for 5-30 MW generators:

- 2.2.1(c) of the NER enables AEMO to exempt a generator "*from the requirement to register as a Generator, subject to such conditions as AEMO deems appropriate*"
- Until a generator has a valid exemption they are treated as an Intending Participant as discussed in Section 1.3;
- As per Section 1.1, AEMO's *Guide to generator exemptions and classification of generating units* (developed under the obligation as per 2.2.1 of the NER) requires either a statement of agreed performance standards of a letter of no harm to other network users prior to granting the exemption;
- Providing such performance standards or a letter of no harm to other network users typically requires a complete connection agreement;
- As per Section 1.3, the NER does not clearly state that the Chapter 5A pathway can be followed for this connection application.
- This means a connection under Chapter 5.3 or 5.3A is required, which causes confusion in relation due to unclear obligations and technical standards as discussed in Section 1.5.

In short, as per the NER at time of writing, a 5-30 MW generator who intends to be exempt from registration must start a connection process under Chapter 5.3 or 5.3A to receive an exemption. Once they have the exemption, they can now proceed under the streamlined Chapter 5A process - however by this stage they have already received a connection offer and are very likely about to start generator energisation and commissioning.

To resolve this confusion, it is proposed to amend clause 2.2.1(c) of the NER to require AEMO to grant a 'conditional' exemption from the requirement to register as a generator for any generators who must apply for an exemption from registration (5-30 MW at time of writing).

A conditional exemption could include an exemption *subject to*:

- Negotiation of technical performance standards with the Connecting NSP; or
- Providing evidence that a Registered Participant is financially responsible for all sent-out generation at the connection point; or
- Final selection of the generator nameplate/size (insofar as the value remains below 30 MW); or
- Providing evidence of expected generation less than 20 GWh per year; or
- Any conditions which AEMO reasonably believes (such as reporting the total export of the system to AEMO each year).

A conditional exemption would provide the following benefits:

1. It resolves the 'chicken-and-egg' problem as described above.
    a. With a conditional exemption, a future 5-30 MW generator who intends to be exempt can approach their Connecting NSP and demonstrate that AEMO has agreed that the generator meets the criteria of a 'non-registered embedded generator' and thus can progress a connection application under Chapter 5A;
    b. It also removes the confusion experienced by the author in recent connection applications of this kind, where the Connecting NSP is unsure on their obligations or the connection pathway.
2. It also provides certainty to the connection applicant that (subject to final demonstration of the exemption criteria to AEMO) they are eligible for an exemption and do not have to take on significant regulatory risk progressing a project.

The minor additional administrative burden imposed on AEMO by this process is expected to be substantially smaller than the current burden caused by the unclear and ambiguous rules (which often requires AEMO's involvement to resolve with the Connecting NSP).

Refer to Appendix A for the proposed alteration to Chapter 2 of the NER as described above.

2.3 - Amendment 2 - Clarify technical requirements for 5-30 MW exempt generators (Chapter 5A)

As per Section 1.5, AEMO and several DNSPs believe that Schedule 5.2 of the NER applies to 5-30 MW generators who intend to be exempt. This is not in line with clause S5.2.1(b) of the NER.

The author agrees that there is merit in adopting the technical requirements in S5.2.5 of the NER for 5-30 MW generators who intend to be exempt, however such adoption shall be in "good faith"[21]. In the case of generators who are in receipt of a conditional exemption from registration from AEMO, the DNSP's technical requirements can be no more onerous than the respective automatic access standard as per Schedule 5.2 including as modified for the generator's exemption (to avoid the ambiguities documented in Section 1.5).

Refer to Appendix B for the proposed alteration to Chapter 5A of the NER as described above.

2.4 - Amendment 3 - Clarify rule 5.3A's purpose & clarify table 5.1.2(b)

As per Section 2.1, the Commission's intention aligns with the author's belief that Chapter 5A is preferred for non-registered embedded generators.

To prevent ambiguity, clause 5.3A.1(b) is proposed to be modified to confirm that rule 5.3A applies only if a generator has elected to follow this process and Chapter 5A is the default connection process.

Furthermore, as per Section 1.3 above, table 5.1.2(b) of the NER is unclear in relation to connection applicants who must apply for an exemption from the requirement to register as a generator. To clarify this confusion, additional text is proposed to confirm that connection applicants who are subject to an automatic exemption or in receipt of a conditional exemption can progress a connection via Chapter 5A.

Refer to Appendix C for the proposed alteration to Chapter 5 of the NER as described above.

3 – Compatibility with ERC0256

There are some similar themes between this rule change and the rule change submitted by the Australian Energy Council (AEC) in December of 2018 (ERC0256, Generator registration thresholds).

One of the two proposals raised in the AEC rule change request is that when "*AEMO does grant a specific exemption beyond the standing exemption, it will be obliged to publish its reasons for doing so, and any conditions attached to such exemption, within ten business days of making its decision*"[22].

The author is supportive of further transparency in the AEMO exemption from registration process for generators in the 5-30 MW nameplate range.

The process described by AEC will provide a reference for an intending exempt participant, but unfortunately will do little to alleviate the commercial/project risk which is created by the current process. That is, AEMO has "absolute discretion"[23] in this matter thereby making the negotiating stance "*that party did it so why can't we?*" potentially futile.

4 – (Summary of) How the Proposed Rule will contribute to the achievement of the National Electricity Objective

As summarised in Section 1.6 above, the current version of the NER does not promote efficient investment in generation co-located with large, distribution connected load. The key barriers are:

- Ambiguities caused by Chapter 5 of the NER and associated technical requirements, impacting project cost and budget; and
- The requirement to receive an AEMO exemption very late in the project schedule (despite its criticality), which may significantly impact project cost and budget.

[21] As per 5A.C.3(a)(1) of the NER
[22] Letter section (Description of the Proposed Rule) of AEC's "*Generator Registration Thresholds Rule Change Request*" available at https://www.aemc.gov.au/sites/default/files/2018-12/Rule%20change%20request_3.pdf
[23] Section 3.3.2 of "*AEMO Guide to generator exemptions and classification of generating units v4.0*" available at https://aemo.com.au/-/media/files/electricity/nem/participant_information/new-participants/generator-exemption-and-classification-guide.pdf?la=en

These barriers prevent these customers from achieving a reduction in their electricity costs and an associated carbon offset, which is not in the best long-term interest of these consumers of electricity and thus is in direct opposition to the National Electricity Objective (NEO).

This rule change request and proposed amendment to the NER described in Section 2 above removes these barriers by:

- Clarifying that the Chapter 5A process in the NER is the default connection pathway for such generating systems (removing the ambiguity); and
- Provides a mechanism for the connecting (intending to be exempt) generator to receive a 'conditional exemption' from the requirement to register as a generator early in the project process, therefore reducing the project schedule/cost risk.

These changes remove the barriers described previously and thus support efficient investment in 5-30 MW generation co-located with load, thereby allowing these customers to achieving a reduction in their electricity costs and an associated carbon offset.

This, in the author's opinion, means the proposed change to the NER is aligned with achieving the NEO.

5 – (Summary of) Explanation of the Expected Benefits and Costs of the Proposed Change

At the time of writing, the author understands the current processing cost for an exemption from the requirement to register as a generator by AEMO is in the order of $6,000 ex GST. This, compared to the typical capital cost of such projects, is almost insignificant (i.e. project capital costs >$20 million is possible for such generators).

Due to the proposed rule change, additional costs are expected to be incurred by the following parties as follows:

- (AEMO) Additional minor administrative costs to process the conditional exemption, then approve the full exemption;
- (Connecting NSP) As such 5-30 MW generator connections are now proposed to be resolved via the negotiation pathway in Chapter 5A, there may be additional costs incurred by the NSP in this process;
- (Connecting Generator) Additional cost payable to both AEMO and the Connecting NSP as part of the connection process (i.e. to cover the above additional costs).

The scope of the rule change proposed is not one which is expected to cost any party a substantial sum (in comparison to the typical capital costs of such projects).

Importantly, without this rule change, the costs which could be incurred by the Connecting Generator could be substantial in the event where AEMO does not approve an exemption or approves subject to some unforeseen requirement. An example of this would be a delay caused by extended negotiation between AEMO and/or the Connecting NSP and/or the Connecting Generator in relation to the exemption validity and/or basis, causing contractor delay costs.

On that basis, whilst the proposed rule change will marginally increase the cost to connect for 'intending exempt participants', the author believes the expected cost is insignificant compared to the potential project benefits created.

6 – Disclaimer

Note the comments / discussion listed herein are personal and are not representative of other people, institutions or organisations that I am affiliated with.

The examples used above (with information redacted) are used as examples only for the purpose of this rule change and are not intended to comment on the performance or actions of any party, or comment on anything in relation to the projects themselves.

AMENDMENT 1 – CHAPTER 2

2.2 Generator

2.2.1 Registration as a Generator

(a) Subject to clause 2.2.1(c), a person must not engage in the activity of owning, controlling or operating a *generating system* that is *connected* to a *transmission or distribution system* unless that person is registered by *AEMO* as a *Generator*.

(b) **[Deleted]**

(c) *AEMO* may, in accordance with guidelines issued from time to time by *AEMO*, exempt a person or class of persons from the requirement to register as a *Generator*, subject to such conditions as *AEMO* deems appropriate, where (in *AEMO's* opinion) an exemption is not inconsistent with the *national electricity objective*.

(1) if the conditions of exemption as determined by *AEMO* require a person or class of persons to submit documentation or evidence, *AEMO* shall, with guidelines issued from time to time by *AEMO*, provide a conditional exemption from the requirement to register as a generator for the person or class of persons.

(2) the conditional exemption referred to in subparagraph (1) shall be valid for no less than 24 months from date of issue.

(3) nothing in subparagraph (1) enables a person or a class of persons to engage in the activity of owning, controlling or operating a *generating system* until *AEMO* accepts the *Generator's* submission detailing how all criteria listed in the conditional exemption have been met.

(4) if a *Generator*, who meets the classification of an *Embedded Generator*, is in receipt of a valid conditional exemption:

(i) the *Generator* is not classified as a *Registered Participant* or *Intending Participant* under the *Rules*; and

(ii) the *Generator* is classified as a *non-registered embedded generator* under the *Rules*.

Note:

A person who is exempt from registration as a *Generator*, may register with *AEMO* as a *Small Generation Aggregator* under rule 2.3A.

AMENDMENT 2 – CHAPTER 5A

5A.C.3 Negotiation framework

(a) The following rules (collectively described as the **negotiation framework**) govern negotiations between a *Distribution Network Service Provider* and a *connection applicant*:

(1) each party must negotiate in good faith.

(1a) the *connection applicant* must, at the request of the *Distribution Network Service Provider*, provide the *Distribution Network Service Provider* with *DER generation information*.

(2) the *connection applicant* must, at the request of the *Distribution Network Service Provider*, provide the *Distribution Network Service Provider* with information it reasonably requires in order to negotiate on an informed basis.

Note

The information might (for example) include estimates of average and *maximum demand* for electricity to be *supplied* through the *connection*.

(3) the *Distribution Network Service Provider* must provide the *connection applicant* with information the *connection applicant* reasonably requires in order to negotiate on an informed basis including:

(i) an estimate of the amount to be charged by the *Distribution Network Service Provider* for assessment of the application and the making of a connection offer for a negotiated *connection contract*; and

(ii) an estimate of *connection charges*; and

(iii) a statement of the basis on which *connection charges* are calculated; and

(iv) if the *connection applicant* has elected to extend the negotiations to *supply services*— an estimate of any applicable charges for *supply services* and a statement of the basis of their calculation.

Note

The *Distribution Network Service Provider* might, according to the circumstances of a particular case, need to provide further information to ensure the *connection applicant* is properly informed – for example, information about:

- technical and safety requirements;
- the types of *connection* that are technically feasible;
- *network* capacity at the proposed *connection point*;
- possible strategies to reduce the cost of the *connection*.

(4) the *Distribution Network Service Provider* may consult with other users of the *distribution network* who may be adversely affected by the proposed *new connection* or *connection alteration*.

(5) in assessing the application, the *Distribution Network Service Provider* must determine:

(i) the technical requirements for the proposed *new connection* or *connection alteration*; and

Note

If the *non-registered embedded generator* is in receipt of a conditional exemption from the requirement to register as a generator under clause 2.2.1(c)(1), the technical requirements proposed by the *Distribution Network Service Provider* must be no more onerous than the equivalent technical requirement applicable to *Registered Participants* as per Schedule 5.2.

The *Distribution Network Service Provider* and *connection applicant* must negotiate technical requirements in good faith as a direct application of the technical requirements listed in Schedule 5.2 are not appropriate to a *non-registered embedded generator*.

AMENDMENT 3 – CHAPTER 5

5.1.2 Overview of Part B and connection and access under the Rules

(a) Rule 5.1A sets out the purpose, application and principles for Part B.

(b) Rule 5.2 sets out the obligations of *Registered Participants* under Part B and other relevant Parts of this Chapter 5.

(c) Rule 5.2A sets out obligations and principles relevant to *connection* and access to *transmission networks* and *large dedicated connection assets*. This includes the classification of certain services relating to assets relevant to *connection* as *prescribed transmission services*, *negotiated transmission services* and *non-regulated transmission services*. Rule 5.2A does not apply to the *declared transmission system* of an *adoptive jurisdiction*.

(d) Rules 5.3, 5.3A and 5.3AA and Chapter 5A set out processes by which *Connection Applicants* can negotiate for connection and access to the *national grid* from a *Network Service Provider*. The process applicable will depend on the nature of the application. The table below sets out an overview of the relevant processes:

Connection Applicant	Process
A non-registered embedded generator who is automatically exempt from the requirement to register as a generator or is in receipt of a conditional exemption as per clause 2.2.1(c)(1) and makes an election for rule 5.3A to apply instead of Chapter 5A	Rules 5.3 and 5.3A apply (see clause 5.3.1A for the interaction between the two rules)
A *load connecting* to a *distribution network* where the *Connection Applicant* is not a *Registered Participant* and is not intending to become a *Registered Participant* (unless it is acting as the agent of a *retail customer*) A non-registered embedded generator who is automatically exempt from the requirement to register as a generator or is in receipt of a conditional exemption as per clause 2.2.1(c)(1) and does not make an election for Rule 5.3A to apply instead of Chapter 5A	Chapter 5A applies

5.3.1A Application of rule to connection of embedded generating units

(a) For the purposes of this clause 5.3.1A;

non-registered embedded generator has the same meaning as in clause 5A.A.1.

(b) If a *Connection Applicant* wishes to *connect* an *embedded generating unit*, then:

(1) rule 5.3A applies to the proposed connection if a *Connection Applicant* elects to connect under this rule rather than Chapter 5A and clauses 5.3.2, 5.3.3, 5.3.4 and 5.3.5 do not apply to the proposed *connection*; and

(2) for the avoidance of doubt, the application of the balance of Chapter 5, Part B to the *Connection Applicant* is otherwise unaffected by this clause 5.3.1A.

(c) A reference to a *Connection Applicant* in paragraph (b) is to a:

(1) person who intends to be an *Embedded Generator*;

(2) person who is required to apply to *AEMO* for an exemption from the requirement to register as a *Generator* in respect of an *embedded generating unit*; or

(3) non-registered embedded generator who has made an election under clause 5A.A.2(c),

and who makes a *connection* enquiry under clause 5.3A.5 or an *application to connect* under clause 5.3A.9 in relation to any *generating systems*, or any *network elements* used in the provision of a *network service*, as the case may be.

5.3A Establishing or modifying connection - embedded generation

5.3A.1 Application of rule 5.3A

(a) For the purposes of this rule 5.3A:

non-registered embedded generator has the same meaning as in clause 5A.A.1

(b) Where a *Connection Applicant* wishes to connect an *embedded generating unit*, this rule 5.3A applies if a *Connection Applicant* elects to connect under this rule rather than Chapter 5A.