EXTRACT OF TRANSITIONAL RULES FOR REGISTRATION FRAMEWORK

Explanatory Note

The reforms to registration include requiring various participants to register in different classes to ensure the reform obligations are placed on individual participants or a group of participants with similar characteristics (in respect of facilities they own, control or operate). A new registration taxonomy is to be introduced into the WEM. The Amending Rules for these, and other registration and participant related reforms, will be drafted in early 2021. However, transitional provisions are required so that the new registration taxonomy applies to Market Participants participating in the Reserve Capacity Mechanism for the 2021 and 2022 Reserve Capacity Cycles.

Accordingly, new clause 1.45 enables the new registration taxonomy to apply to the 2021 and 2022 RCM Capacity Cycles while maintaining the existing registration concepts under current market arrangements until the New WEM Commencement Day which is when the new registration taxonomy will apply.

The intent of clause 1.45 is:

- Automatically transition (via deeming provisions) that all existing market participants (e.g. Market Generators and Market Customers in current WEM Rules) participating in the 2021 and 2022 Reserve Capacity Cycles to the Market Participant class
- Automatically transition (via deeming provisions) all existing market participants' Registered Facilities to new equivalent Facility classes unless certain conditions apply. Where those conditions apply, the transitional WEM Procedure will apply and AEMO will be required to determine a different Facility Class as per the new Facility Classes specified in section 2.29.
- If there is an **existing unregistered facility**, the facility will be assessed as per the new Facility technology types specified in section 2.29 and will be assigned a Facility Class.
- Any **new facility** participating in the Reserve Capacity Mechanism for the first time will be required to follows the processes under Chapter 4.
- 1.45. Specific Transitional Provisions Registration for the 2021 Reserve Capacity Cycle and the 2022 Reserve Capacity Cycle
- 1.45.1. On and from the New RCM Transition Date, for the 2021 Reserve Capacity Cycle and the 2022 Reserve Capacity Cycle:
 - (a) a Market Generator and Market Customer registered under these WEM
 Rules on the New RCM Transition Date is deemed to be registered as a
 RCM Market Participant; and
 - (b) a Registered Facility that is registered to a Market Generator or Market

 Customer referred to in clause 1.45.1(a) is deemed to be registered under the equivalent RCM Facility Class set out in clause 1.45.2, unless one or more of the conditions specified under clause 1.45.3 apply to that Registered Facility;
- 1.45.2. For the purpose of clause 1.45.1(b), the table below sets out the equivalent RCM Facility Class that is deemed to apply to a Registered Facility.

Facility Class immediately before the New RCM Transition Date	Equivalent RCM Facility Class from the New RCM Transition Date
Scheduled Generator	Scheduled Facility
Non-Scheduled Generator below 10 MW	Non-Scheduled Facility
Non-Scheduled Generator at or above 10 MW	Semi-Scheduled Facility
Interruptible Load	Interruptible Load
Demand Side Programme	Demand Side Programme

- 1.45.3. For the purpose of clause 1.45.1(b), where any of the following conditions apply to a Registered Facility, the RCM Market Participant for that Registered Facility must apply to AEMO to seek an assessment for an applicable RCM Facility Class in accordance with the timeframe and processes as specified in the WEM Procedure under clause 1.45.8:
 - (a) the Registered Facility's System Size is anticipated to increase or decrease after the New RCM Transition Date;
 - (b) any new equipment is planned to be added to the Registered Facility after the New RCM Transition Date; or
 - (c) the RCM Market Participant considers that registration in a different RCM

 Facility Class for that Registered Facility is more appropriate than the RCM

 Facility Class deemed by clause 1.45.2.
- 1.45.4. AEMO must process any application for assessment it receives under clause

 1.45.3, by the date and time specified in 4.1.7 for the 2021 Reserve Capacity

 Cycle and 2022 Reserve Capacity Cycle, in accordance with the WEM Procedure specified in clause 1.45.8.
- 1.45.5. When conducting an assessment under clause 1.45.4, where AEMO considers that the RCM Facility Class assigned to that Registered Facility is no longer appropriate, AEMO must assign that Registered Facility another RCM Facility Class as specified in clause 2.29.1A.
- 1.45.6. AEMO's determination of a RCM Facility Class under this section 1.45 is final.
- 1.45.7. A Facility that is unregistered as at the New RCM Transition Date that intends to participate in the 2021 Reserve Capacity Cycle and 2022 Reserve Capacity Cycle must apply to AEMO for an RCM Facility Class and AEMO must use the Facility Technology Types specified in clause 2.29.1 to assess the facility and assign an RCM Facility Class, which must be a Facility Class specified in clause 2.29.1A.

To avoid doubt, the processes in Chapter 4 of these WEM Rules will apply to the facility.

1.45.8. AEMO must develop a WEM Procedure specifying:

- (a) the process for a Registered Facility to apply to AEMO to seek an assessment for an applicable Facility Class under clause 1.45.3,
- (b) the process for a facility to apply to AEMO for a RCM Facility Class under clause 1.45.7;
- (c) the process AEMO will follow in making its assessment of an RCM Facility

 Class; and
- (d) the timeframes by when an application must be lodged and a decision made.

1.45.9. In this section 1.45:

RCM Market Participant: Means a Market Participant that is registered as an RCM Market Participant under clause 1.45.1; and

RCM Facility Class: Means the facility class referred to in clause 1.45.2 and 1.45.7 that applies to a Registered Facility under clause 1.45.1.

1.46. Specific Transitional Provisions – Registration from New WEM Commencement Day

1.46.1. On and from the New WEM Commencement Day:

- (a) a Market Customer and Market Generator registered under these WEM

 Rules on the New WEM Commencement Day are deemed to be registered in the Market Participant class; and
- (b) a Registered Facility that is registered to a Market Customer or Market

 Generator referred to in clause 1.46.1(a) is deemed to be registered under
 the equivalent Facility Class set out in clause 1.46.2, unless one or more of
 the conditions specified under clause 1.46.3 apply to that Registered
 Facility.
- 1.46.2. For the purpose of clause 1.46.1(b), the table below sets out the Facility Class that is deemed to apply to a Registered Facility.

Facility Class immediately before the New WEM Commencement Day	Equivalent Facility Class from the New WEM Commencement Day
Scheduled Generator	Scheduled Facility
Non-Scheduled Generator below 10 MW	Non-Scheduled Facility
Non-Scheduled Generator at or above 10 MW	Semi-Scheduled Facility
Interruptible Load	Interruptible Load
Demand Side Programme	Demand Side Programme

- 1.46.3. For the purposes of clause 1.46.1(b), where any of the following conditions apply to a Registered Facility, the Market Participant for that Registered Facility must apply to AEMO to seek an assessment for an applicable Facility Class in accordance with the timeframe and processes as specified in the WEM Procedure under clause 1.46.8:
 - (a) the Registered Facility's System Size is anticipated to increase or decrease after the New WEM Commencement Day;
 - (b) any new equipment is planned to be added to the Registered Facility after the New WEM Commencement Day; or
 - (c) the Market Participant considers that registration in a different Facility

 Class for that Registered Facility is more appropriate than the Facility

 Class deemed by clause 1.46.2.
- 1.46.4. AEMO must process any application for assessment it receives under clause
 1.46.3, by the New WEM Commencement Day, in accordance with the WEM
 Procedure specified in clause 1.46.8.
- 1.46.5. When conducting an assessment under clause 1.46.4, where AEMO considers that the existing Facility Class assigned to that Registered Facility is no longer appropriate, AEMO must assign that Registered Facility another Facility Class which must be a Facility Class specified in clause 2.29.1A.
- 1.45.6. AEMO's determination of a Facility Class under this section 1.46 is final.
- 1.46.7. A facility that is unregistered as at the New WEM Commencement Day must apply to AEMO for a Facility Class and AEMO must use the Facility Technology Types defined in clause 2.29.1 to assess the facility and assign a Facility Class, which must be a Facility Class as specified in 2.29.1A.

1.46.8. AEMO must develop a WEM Procedure specifying:

- (a) the process for a Market Participant to apply to AEMO to seek an assessment for an applicable Facility Class under clause 1.46.3,
- (b) the process for a Market Participant to apply to AEMO for a Facility Class under clause 1.46.7;
- (c) the process AEMO will follow in making its assessment of an Facility Class; and
- (d) the timeframes by when an application must be lodged, and a decision made.

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Explanatory Note

Amendments to section 2.34 (Standing Data) will be developed in early 2021 as part of the remaining Registration and Participation work package.

The Tranche-3 Amending Rules include a proposed new clause 1.AA.2 that provides for the grandfathering of the existing arrangements for Intermittent Loads. Any further changes to Intermittent Loads will be progressed in early 2021 as part of the remaining Registration and Participation work package.

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Participation and Registration

Explanatory Note

Clause 2.28.1 has been amended to reflect the Taskforce's decisions described in the Information Paper: Registration and Participation Framework in the Wholesale Electricity Market.

A new 'Market Participant' class will be created to replace the existing Market Generator, Market Customer and Ancillary Service Provider classes. This category will denote a participant who provides or consumes a WEM product or service (i.e. any participant that is part of the financial settlement process). A Market Participant will have obligations in respect of its Facilities. Therefore, a Market Participant must register its Facilities.

No change is required to the Network Operator class.

2.28. Rule Participants

2.28.1. The classes of Rule Participant are:

- (a) Network Operator;
- (b) Market Generator;
- (c) Market Customer;
- (cA) Ancillary Service Providers;
- (d) System Management;
- (dA) System Operator; and

- (e) [Blank]
- (fc) AEMO.

2.28.1. The classes of Rule Participant are:

- (a) Network Operator;
- (b) Market Participant; and
- (c) AEMO.
- 2.28.2. Subject to clauses 2.28.3 and 2.28.16, a person who owns, controls or operates a transmission system or distribution system which forms part of the South West Interconnected System, or is electrically connected to that system, must register as a Rule Participant in the Network Operator class.
- 2.28.3. A person that owns, controls or operates a transmission system or distribution system may, but is not required to, register as a Rule Participant in the Network Operator class where both the following are satisfied:
 - (a) AEMO has determined that it does not require information about the relevant network to ensure Power System Security and Power System Reliability are maintained; and
 - (b) no Market Participant Registered Facilities are directly connected to the transmission system or distribution system.

Explanatory Note

Clause 2.28.3A has been moved (and modified) to new proposed clause 2.28.20.

2.28.3A. AEMO must develop a WEM Procedure specifying:

- (a) information that a Network Operator must provide to AEMO, for each of its Networks, including:
 - i. positive, negative and zero sequence network impedances for the network elements;
 - ii. information on the network topology;
 - iii. information on transmission circuit limits;
 - iv. information on security constraints;
 - v. overload ratings, including details of how long overload ratings can be maintained; and
 - vi. the short circuit capability of facility equipment;
- (b) the processes to be followed by a Network Operator to enable AEMO to have access to the information specified in clause 2.28.3A(a);

- (c) technical and communication criteria that a Network Operator must meet with respect to AEMO's ability to access the information specified in clause 2.28.3A(a); and
- (d) the processes to be followed by AEMO when accessing the information specified in clause 2.28.3A(a).

2.28.3BA. A Network Operator must:

- (a) promptly provide to AEMO all data available to it and reasonably required to model the static and dynamic performance of the SWIS, including (without limitation) computer models of the performance of the Network and Facilities connected, or which may be connected in the future, to the Network:
- (b) promptly forward to AEMO subsequent updates of the data referred to in clause 2.28.3BA(a);
- (c) use its reasonable endeavours to ensure that all data referred to in this clause 2.28.3BA is complete, current and accurate;
- (d) promptly notify AEMO if there are any reasonable grounds for suspecting that the data provided under this clause 2.28.3 A is no longer complete, current and accurate; and
- (e) include as part of the data provided to AEMO under this clause 2.28.3BA:
 - all data provided to the Network Operator that is used for the purpose of modelling in relation to the SWIS by generators, customers, Market Participants, other Network Operators and any other source; and
 - ii. all data relating to actual, committed or proposed modifications to the SWIS that the Network Operator reasonably considers are relevant to modelling in relation to the SWIS.

2.28.3 CB. Where AEMO:

- (a) is satisfied that the performance of a Facility (or equipment within the Facility) is not adequately represented by any applicable data provided under clause 2.28.3BA; and
- (b) holds the reasonable opinion that the inadequacy of the applicable data, is or will impede AEMO's ability to carry out its functions in relation to Power System Security and Power System Reliability,

AEMO may:

(c) request that the Network Operator provide to AEMO, as soon as reasonably practicable, revised or additional data and an associated model validation report demonstrating to AEMO's reasonable satisfaction that the performance of the Facility (or equipment within the Facility) has been

- tested and is performing substantially in accordance with the revised modelling data; and
- (d) direct the relevant Rule Market Participant, or Network Operator where relevant, to operate the Facility (or equipment within the Facility) at a particular level of output or in a particular manner, until the Network Operator has submitted that revised data and associated model validation report and AEMO is satisfied that the performance of the Facility (or equipment within the Facility) is performing substantially in accordance with that data.
- 2.28.4. A person who intends to own, control or operate a transmission system or distribution system which will form part of the South West Interconnected System, or will be electrically connected to that system, may register as a Rule Participant in the Network Operator class.

Clause 2.28.5 has been deleted as a Network Operator may only be registered in one Rule Participant class.

2.28.5. [Blank] Subject to clause 2.28.16, a person registered as a Network Operator may be registered as a Rule Participant in another class or other classes.

Requirement to register or exemption from the requirement to register based on System Size

2.28.6. Subject to clause 2.28.16, a person who owns, controls or operates <u>an generation energy producing</u> system which has a rated capacity with a System Size that equals or exceeds 10 MW and is electrically connected to a transmission system or distribution system which forms part of the South West Interconnected System, or is electrically connected to that system, must register as a Rule Participant in the Market Generator Participant class.

Explanatory Note

Clause 2.28.7 is amended and clause 2.28.7A added to reflect the new registration framework where a person who owns, controls or operates a facility with a System Size of between 5 MW and 10 MW may apply to AEMO for an exemption from the requirement to register. AEMO will process an application for exemption in accordance with exemption criteria that AEMO will be required to specify in a WEM Procedure. AEMO will be required to grant an exemption other than for reasons of Power System Security and Power System Reliability.

2.28.7. A person that owns, controls or operates an generation energy producing system which has a rated capacity with a System Size of less than 10 MW, but which equals or exceeds 0.005 5 MW, and is electrically connected to a transmission system or distribution system which forms part of the South West Interconnected System, or is electrically connected to that system, must apply to AEMO for an exemption from the requirement to register in the Market Participant class. may register as a Rule Participant in the Market Generator class.

2.28.7A. AEMO must grant an exemption from the requirement to register in the Market Participant Class for an application received under clause 2.28.7 unless AEMO determines, in accordance with the WEM Procedure specified in clause 2.28.20, that the facility must be registered for the purposes of Power System Security and Power System Reliability.

Explanatory Note

Clause 2.28.8 is amended to reflect the new registration framework where any facility with a System Size of less than 5 MW will have a standing exemption from the requirement to be registered. However, AEMO may revoke a standing exemption for reasons of Power System Security and Power System Reliability.

2.28.8. Subject to clause 2.28.8A, aA person who intends to own, control or operate—a generation an energy producing system which has a rated capacity with a System Size that equals or exceeds 0.005 MW is less than 5 MW and is or will be electrically connected to a transmission system or distribution system which forms part of the South West Interconnected System, or is electrically connected to that system, may register as a Rule Participant in the Market Generator class is exempt from the requirement to register in a Rule Participant class.

2.28.8A. Clause 2.28.8 does not apply where:

- (a) the facility is required to be registered in accordance with section 2.29; or
- (b) AEMO determines, in accordance with the WEM Procedure specified in clause 2.28.20, that the facility must be registered for the purposes of Power System Security and Power System Reliability.

Explanatory Note

Existing clause 2.28.9 is deleted to reflect that there are no separate Market Generator and Market Customer classes in the new registration framework.

New (replacement) clause 2.28.9 provides that where AEMO does not grant an exemption from the requirement to register in respect to a facility less than 10 MW, then the person who owns, operates or controls the facility must register in the Market Participant class.

- 2.28.9. Subject to clause 2.28.16, a person registered as a Market Generator may be registered as a Rule Participant in another class or other classes.
- 2.28.9. If AEMO does not grant an exemption in respect of an application made under clause 2.28.7 or clause 2.28.8A, the person who owns, controls or operates the energy producing system the subject of that application must register in the Market Participant class.

Explanatory Note

New clause 2.28.9A requires that any person exempted from the requirement to register that intends to make any modifications to its energy producing system must notify AEMO. AEMO will then determine whether the exemption from the requirement to register remains in place.

- 2.28.9A. Where a person who owns, controls or operates an energy producing system is granted an exemption by AEMO under clause 2.28.7A or clause 2.29.4C, or is exempt from the requirement to register under clause 2.28.8 or register its energy producing system under clause 4.29.4D, and the person intends to make modifications to its energy producing system, the person must notify AEMO as soon as practicable and provide details of the proposed modifications.
- 2.28.9B. Where AEMO receives a notification under clause 2.28.9A, AEMO must reassess the exemption in accordance with the exemption criteria set out in the WEM Procedure specified in clause 2.28.20 and AEMO must either:
 - (a) confirm the exemption remains valid; or
 - (b) revoke the exemption.
- <u>2.28.9BA. Where AEMO revokes an exemption under clause 2.28.9B, the person who</u> owns, controls or operates the relevant energy producing system must:
 - (a) register in the Market Participant class; and
 - (b) register its energy producing system in the relevant Facility Class in accordance with section 2.29.
- 2.28.9C. AEMO may, at any time, revoke an exemption granted in respect to an application made under clauses 2.28.7 or 2.28.8A, or clauses 2.29.4C or 2.29.4D, if AEMO considers that the relevant energy producing system no longer meets the exemption criteria set out in the WEM Procedure specified in clause 2.28.20.
- 2.28.10. Subject to clause 2.28.16, a person who sells electricity to Contestable Customers in respect of facilities electrically connected to a transmission system or distribution system which forms part of the South West Interconnected System, or is electrically connected to that system, must register as a Rule Participant in the Market Customer Participant class.
- 2.28.11. A person who intends to sell electricity to Customers in respect of Facilities electrically connected to a transmission system or distribution system which forms part of the South West Interconnected System, or is electrically connected to that system, may register as a Rule Participant in the Market Customer Participant class.
- 2.28.11A. A person who intends to enter into an Ancillary Service Contract with System

 Management and who is not registered in any other Rule Participant Class must register as an Ancillary Service Provider;
- 2.28.11B. A person who is registered in a Rule Participant Class other than the Ancillary Service Provider class, or who does not intend to enter into an Ancillary Service Contract with System Management may not register as an Ancillary Service Provider.

- 2.28.12. [Blank] Subject to clause 2.28.16, a person registered as a Market Customer may be registered as a Rule Participant in another class or classes.
- 2.28.13. Subject to clause 2.28.16 and 4.24.4, a person not covered by clauses 2.28.2 to 2.28.12 but who sells or purchases electricity or provides another electricity related service under these WEM Rules to or from AEMO, including, without limitation, a person who provides an Essential System Service or to whom a Demand Side Programme is registered, must register as a Rule Participant in the Market Participant class. The person must register in either the Market Generator class or the Market Customer class, as determined by AEMO.
- 2.28.14. [Blank]
- 2.28.15. [Blank]
- 2.28.15A. AEMO is a Rule Participant, but is not required to register, and must not be registered in any other Rule Participant class.
- 2.28.16 AEMO may determine that a person is exempted from the requirement to register in accordance with clauses 2.28.2, 2.28.6, 2.28.10, 2.28.11A or 2.28.13. An exemption may be given subject to any conditions AEMO considers appropriate and may, upon prior reasonable notice, be revoked at any time.
- 2.28.16A. For the purposes of clause 2.28.16:
 - (a) A person (the "Applicant") who applies to AEMO for an exemption under clause 2.28.16 from the requirement to register-may must:
 - notify AEMO of the identity of a person (an "Intermediary") to be registered instead of the Applicant;
 - ii. provide AEMO with the written consent of the Intermediary to act as Intermediary in a form reasonably acceptable to AEMO;
 - (b) If an application for exemption made in accordance with clause 2.28.16A(a) is granted by AEMO in accordance with clause 2.28.16 then:
 - provided the Intermediary satisfies all relevant registration requirements that the Applicant would have been required to satisfy, AEMO must register the Intermediary as a Rule Participant as if it were the Applicant;
 - ii. the Intermediary will be considered for the purposes of these WEM Rules to be the Applicant;
 - iii. all references in these WEM Rules to the Applicant will be deemed to be references to the Intermediary (unless the context requires otherwise);
 - iv. all acts, omissions, statements, representations and notices of the Intermediary in its capacity as the Rule Participant under these

- WEM Rules will be deemed to be the acts, omissions, statements, representations and notices of the Applicant;
- v. the Intermediary and the Applicant will be jointly and severally liable for the acts, omissions, statements, representations and notices of the Intermediary in its capacity as the Rule Participant under these WEM Rules;
- vi. AEMO or any other Rule Participant may fulfil any obligations to the Applicant under these WEM Rules by performing them in favour of the Intermediary;
- vii. the Applicant must procure, and where necessary must facilitate, the Intermediary's compliance with its obligations under these WEM Rules, including any obligations that, but for the exemption, would be placed on the Applicant; and
- viii. the Applicant must, where necessary, participate in and abide by the outcome of any dispute process under clauses 2.18 to 2.20.
- (c) For the purposes of enforcing clauses 2.28.16A(b)(vii) and (viii), a reference in these WEM Rules to "Rule Participant" includes the Applicant.
- (d) The Applicant may revoke the appointment of the Intermediary by giving notice of such revocation to AEMO.
- (e) At 4.30 am, 2 business days after AEMO receives notice of such revocation, the Intermediary will cease to be considered the Applicant's Intermediary for the purposes of these WEM Rules and the Applicant will not be liable under clause 2.28.16A(b)(v) for any acts, omissions, statements, representations or notices of the Intermediary occurring after that time.
- (f) If the Applicant revokes the appointment of an Intermediary, the exemption granted by AEMO to the Applicant as contemplated by clause 2.28.16A(b) ceases at the time the Intermediary ceases to be the Applicant's Intermediary in accordance with clause 2.28.16A(e).
- (g) AEMO may permit the Applicant to designate the Intermediary as the Applicant's Intermediary for part only of the Applicant's business (provided that that part represents one or more discrete Facilities).

Existing clause 2.28.16B is proposed to be considered as part of amendments to Section 2.30B Intermittent Load in early 2021. Any proposed amendments shown in the base clause in these Amending Rules are placeholder amendments only.

2.28.16B. Without limiting the generality and the operation of clause 2.28.16, AEMO may exempt under clause 2.18.16 a person who owns, controls or operates a generation system which has a rated capacity that equals or exceeds 10 MW and is electrically connected to a transmission system or distribution system which forms part of the South West Interconnected System, or is electrically connected

to that system, from the requirement to register as a Rule Participant in the Market Generator class, in respect of that generation system, where all of the following are satisfied:

- (a) positive MWh quantities measured by the interval meter or meters associated with that generation system are not reasonably expected to exceed 5 MWh in any Trading Interval;
- (b) negative MWh quantities measured by the interval meter or meters associated with that generation system are not reasonably expected to increase by more than 5 MWh in any Trading Interval in the event of an outage of that generating energy producing system;
- (c) System Management has determined that it does not require information about the relevant generation system to ensure Power System Security and Power System Reliability are maintained;
- (d) The meter or meters measuring the generation system remains registered by an existing Market Customer Participant; and
- (e) AEMO determines that with the exemption the cumulative effect of all exemptions given under this clause 2.28.16B is consistent with the Wholesale Market Objectives,

and AEMO may give the exemption subject to any conditions AEMO considers appropriate and may revoke the exemption if AEMO determines that any of these conditions, or any of the conditions in this clause 2.28.16B, ceases to be satisfied.

- 2.28.17. A Rule Participant under these WEM Rules is a participant for the purposes of section 121(2) of the Electricity Industry Act.
- 2.28.18. [Blank] A Rule Participant that is registered as either a Market Generator or a Market Customer is a Market Participant. Where a Rule Participant is registered as both a Market Generator and a Market Customer it is represented as being one Market Participant that is both a Market Generator and a Market Customer.
- 2.28.19. A Rule Participant must:
 - (a) be resident in, or have permanent establishment in, Australia;
 - (b) not be an externally-administered body corporate (as defined in the Corporations Act), or under a similar form of administration under any laws applicable to it in any jurisdiction;
 - (c) not have immunity from suit in respect of the obligations of a Rule Participant under these WEM Rules; and
 - (d) be capable of being sued in its own name in a court of Australia.

Explanatory Note

New proposed clause 2.28.20 is a modified version of clause 2.28.3A which is proposed to be relocated to the end of section 2.29.

AEMO will be required to develop a new WEM Procedure (or amend the existing WEM Procedure) that sets out the exemption criteria for the requirement to register as a Market Participant or a facility in a Facility Class. This WEM Procedure will also outline the processes that are to be followed by both AEMO and Market Participants in applying for, assessing, granting and revoking an exemption.

2.28.20 AEMO must document the following in a WEM Procedure:

- (a) information that a Network Operator must provide to AEMO, for each of its Networks, including:
 - i. positive, negative and zero sequence network impedances for the network elements;
 - ii. information on the network topology;
 - iii. information on transmission circuit limits;
 - iv. information on security constraints;
 - v. overload ratings, including details of how long overload ratings can be maintained; and
 - vi. the short circuit capability of facility equipment;
- (b) the processes to be followed by a Network Operator to enable AEMO to access the information specified in clause 2.28.20(a);
- (c) technical and communication criteria that a Network Operator must meet with respect to AEMO's ability to access the information specified in clause 2.28.20(a);
- (d) the processes to be followed by AEMO when accessing the information specified in clause 2.28.20(a);
- (e) the exemption criteria to apply to a person and an energy producing system referred to in clauses 2.28.7A, 2.28.8A, 2.28.9B or 2.29.4C(b), which must include assessment criteria for AEMO to ensure that exempting an energy producing system from the requirement to register does not adversely affect Power System Security or Power System Reliability; and
- (f) the processes to be followed by AEMO and Market Participants in applying for, assessing, granting and revoking an exemption.

2.29. Facility Registration Classes

Explanatory Note

Clause 2.29.1 outlines the types of technology that may exist in the WEM. Clause 2.29.1A outlines the Facility Classes for the purposes of registration in the WEM.

A Facility may contain one or more technology types (however they may be limited by rules related to facility aggregation and requirement to be at a single network connection point). The determination of Facility Class will be made by AEMO in accordance with the registration process. For example, a Market Participant that has an energy producing system that comprises an Electric

Storage Resource and an Intermittent Generating System may be assessed to be in the Semi-Scheduled Facility Class based on the size of its components and controllability.

Small DER Aggregation as a Facility Technology Type has not yet been fully defined in the current Amending Rules. It is noted that the Tranche 3 Amending Rules uses the term 'Small DER Aggregation'. The definition will be further reviewed for the purposes of the registration framework.

2.29.1. The following are Facilities for the purposes of these WEM Rules:

- (a) a distribution system;
- (b) a transmission system;
- (c) a generation system;
- (d) a connection point at which electricity is delivered from a distribution system or transmission system to a Rule Participant ("Load"); and
- (e) a Demand Side Programme.

2.29.1. The Facility Technology Types are:

- (a) a distribution system;
- (b) a transmission system;
- (c) an Intermittent Generating System;
- (d) a Non-Intermittent Generating System;
- (e) an Electric Storage Resource;
- (f) a Scheduled Load;
- (g) a Small DER Aggregation; and
- (h) a Non-Dispatchable Load.

2.29.1A. The Facility Classes are:

- (a) a Network;
- (b) a Scheduled Generator;
- (c) a Non-Scheduled Generator;
- (d) an Interruptible Load; and
- (e) [Blank]
- (f) a Demand Side Programme.

2.29.1A. The Facility Classes are:

- (a) a Network;
- (b) a Scheduled Facility;
- (c) a Semi-Scheduled Facility;
- (d) a Non-Scheduled Facility;

- (e) an Interruptible Load; and
- (f) a Demand Side Programme.
- 2.29.2. <u>Subject to clause 2.29.2A, No-no</u> facility registered in one Facility Class can simultaneously be registered in another Facility Class.

New clause 2.29.2A provides an explicit exemption in the WEM Rules that may enable Market Participants to register a Demand Side Programme or Interruptible Load at a common set of network connection points to another Registered Facility.

- 2.29.2A. Notwithstanding clause 2.29.2, AEMO may allow a Market Participant to register a Demand Side Programme or Interruptible Load at a common set of network connection points to another Registered Facility.
- 2.29.3. Subject to clause 2.29.9, a Network Operator must register any transmission system or distribution system owned, operated or controlled by that Network Operator as a Network, where that transmission or distribution system forms part of the South West Interconnected System, or is electrically connected to that system.
- 2.29.4. Subject to clause 2.29.9, a Market Participant must register one or more Facility

 Technology Types listed in clauses 2.29.1(c) to 2.29.1(h) in one or more Facility

 Classes in accordance with the registration process specified in section 2.31.

 Generator that owns, operates or controls a generation system:
 - (a) must register that generation system as a Non-Scheduled Generator where the generation system has a rated capacity that equals or exceeds 0.005 MW and the generation system is an Intermittent Generator;
 - (b) must register that generation system as a Scheduled Generator where the generation system has a rated capacity that equals or exceeds 10 MW and the generation system is not an Intermittent Generator;
 - (c) subject to clause 2.29.6, may register that generation system as a Scheduled Generator where the generation system is not an Intermittent Generator and has a rated capacity that equals or exceeds 0.2 MW but which is less than 10 MW; and
 - (d) must register that generation system as a Non-Scheduled Generator where the generation system has a rated capacity that equals or exceeds 0.005 MW and where the generation system is not otherwise required to be registered in accordance with clause 2.29.4(a) or (b) and where the option to register in accordance with clause 2.29.4(c), if applicable, is not exercised.

Requirement to register a facility or exemption from the requirement to register based on System Size

- 2.29.4A. Subject to clause 2.29.9, a person who owns, controls or operates an energy producing system with a System Size that equals or exceeds 10 MW and is electrically connected to a transmission system or distribution system which forms part of the South West Interconnected System, or is electrically connected to that system, must register the facility in a Facility Class.
- 2.29.4B. A person that owns, controls or operates <u>an</u> energy producing system <u>with a System Size</u> of less than 10 MW, but which equals or exceeds <u>5</u> MW, and is electrically connected to a transmission system or distribution system which forms part of the South West Interconnected System, or is electrically connected to that system:
 - (a) may register the facility in a Facility Class; or
 - (b) otherwise, must apply to AEMO for an exemption from the requirement to register in the facility in a Facility Class.
- 2.29.4C. Where AEMO receives an application under clause 2.29.4B(b), AEMO must grant an exemption from the requirement to register unless AEMO determines, in accordance with the WEM Procedure specified in clause 2.28.20, that the facility must be registered in a Facility Class for the purposes of Power System Security and Power System Reliability.
- 2.29.4D. A person who intends to own, control or operate an energy producing system with a System Size that is less than 5 MW and is or will be electrically connected to a transmission system or distribution system which forms part of the South West Interconnected System, or is electrically connected to that system, is exempted from the requirement to register the facility in a Facility Class.
- 2.29.4E. Clause 2.29.4D does not apply where AEMO determines, in accordance with the WEM Procedure specified in clause 2.28.20, that the facility must be registered in a Facility Class for the purposes of Power System Security and Power System Reliability.
- 2.29.4F. If AEMO does not grant an exemption in respect to an application made under clause 2.29.4B, the person who owns, controls or operates the energy producing system in respect to that application must register the facility in a Facility Class.
- 2.29.5. Subject to clauses 2.29.9 and 2.29.8A, a Market Customer that owns, operates or controls a Load may register that Load as an Interruptible Load if that Load has equipment installed to cause it to be interrupted in response to under frequency situations.

Explanatory Note

New clause 2.29.5 is similar to clause 2.29.5A so that a Market Participant, other than the Financially Responsible Market Participant, can aggregate loads to register Interruptible Loads.

- 2.29.5. A Market Participant that owns, operates or controls a Non-dispatchable Load or:
 - (a) has entered into; or
 - (b) intends to enter into,

a contract with a person who owns, controls or operates a Non-Dispatchable Load, for the Load to be interrupted in response to under frequency situations may register an Interruptible Load.

- 2.29.5A. A Market Customer Participant that:
 - (a) has entered into; or
 - (b) intends to enter into

a contract with a person who owns, controls or operates a Non-Dispatchable Load or Interruptible Load, for the Load to provide curtailment on request by the Market Customer Participant, may register a Demand Side Programme.

- 2.29.5AA. A Market Participant that owns, controls or operates a Load may register that

 Load as a Registered Facility containing a Scheduled Load provided AEMO has

 certified the Load to be controllable for the purposes of scheduling and dispatch.
- 2.29.5AB. AEMO must document in a WEM Procedure in clause 2.29.10 the processes and procedures to be followed by AEMO and Market Participants for a Load to be eligible to be registered as a Scheduled Load, including the assessment criteria AEMO will apply in determining the level of controllability of the Load.
- 2.29.5B. A Market Customer Participant with a Demand Side Programme or Interruptible

 Load may apply to AEMO to associate a Non-Dispatchable Load or Interruptible

 Load with the Demand Side Programme or Interruptible Load. The Market

 Customer Participant must provide the following information to AEMO in support of the application:
 - (a) evidence satisfactory to AEMO that the Market <u>Customer Participant</u> has entered into a contract with the person who owns, operates or controls the Load to provide curtailment <u>or interruption</u>, as <u>applicable</u>, on request by the Market <u>Customer Participant</u>;
 - (b) the network connection point of the Load;
 - (c) the expected Minimum Consumption of the Load in units of MW;
 - (d) the contract start date;
 - (e) the contract end date; and
 - (f) where the Load has a generation an energy producing system that can connect to the network behind its associated meter, a single line diagram

- for the Load, including the locations of generators, transformers, switches, operational and settlement meters.
- (g) in respect of an application to associate a Non-Dispatchable Load with a

 Demand Side Programme, the single Transmission Node Identifier for that

 Non-Dispatchable Load provided by the Market Participant under clause

 4.10.1(f)(viii).
- 2.29.5BA. A Market Participant for a Scheduled Facility or Semi-Scheduled Facility containing an Electric Storage Resource in addition to other generating equipment, must install a separate meter for the Electric Storage Resource and all associated Parasitic Loads. To avoid doubt, meters that are installed under this clause 2.29.5BA must not be used for the purposes of settlement under Chapter 9.
- 2.29.5BB. A meter referred to in clause 2.29.11 must comply with the requirements specified in the WEM Procedure referred to in clause 2.29.16.
- 2.29.5BC. AEMO must document the following matters in a WEM Procedure in relation to a meter referred to in clause 2.29.5BA.
 - (a) the characteristics and requirements, including accuracy requirements, for the meter;
 - (b) the procedures to be followed by Market Participants for auditing of the meter;
 - (c) the communication requirements and protocols between a Market Participant and AEMO;
 - (d) the processes to be followed by a Market Participant for providing meter information to AEMO; and
 - (e) any other matters which AEMO considers relevant.
- 2.29.5C. AEMO must within one Business Day notify an applicant of the receipt of the application submitted under clause 2.29.5B. AEMO may, at its discretion, require that an applicant provide information that is missing from the application or is inadequately specified. The date the requested information is submitted to AEMO will become the date of receipt of the application.
- 2.29.5D. AEMO must determine, in accordance with clause 2.29.5E, whether to accept or reject an application submitted under clause 2.29.5B, and must notify the applicant of its decision within 10 Business Days of receipt of the application.

Clause 2.29.5E is proposed to be amended so that AEMO must accept an application submitted under clause 2.29.5B unless, as specified in 2.29.5E(b), where the application is to associate a Non Dispatchable Load with a Demand Side Programme, the relevant Load is not equipped with interval metering.

In addition to clause 2.29.5E(b), new clause 2.29.5E(bA) is added so that AEMO must accept an application submitted under clause 2.29.5B unless an application to associate a Non Dispatchable Load with a Demand Side Programme the relevant Load does not have equipment installed to allow it to be interrupted in response to under frequency situations.

- 2.29.5E. AEMO must accept an application submitted under clause 2.29.5B unless:
 - (a) AEMO considers that the evidence provided by the Market Customer Participant under clauses 2.29.5B and 2.29.5C is not satisfactory;
 - (b) <u>for an application to associate a Non Dispatchable Load with a Demand</u>
 <u>Side Programme</u>, the relevant Load is not equipped with interval metering;
 - (bA) for an application to associate a Non Dispatchable Load with an Interruptible Load, the relevant Load does not have equipment installed to allow it to be interrupted in response to under frequency situations;
 - (c) [Blank]the relevant Load is an Interruptible Load assigned Capacity Credits for any part of the proposed Association Period;
 - (d) the relevant Load is registered as an Intermittent Load for any part of the proposed Association Period;
 - (e) <u>subject to clause 2.29.2A</u>, the relevant Load is already associated with a Demand Side Programme <u>or an Interruptible Load</u> for any part of the proposed Association Period; or
 - (f) <u>for an application to associate a Non Dispatchable Load with a Demand Side Programme</u> during the same Capacity Year, the relevant Load was an Associated Load of another Demand Side Programme and, while it was so associated:
 - the other Demand Side Programme passed a Reserve Capacity Test or a Verification Test; or
 - ii. any part of DSM Reserve Capacity Security associated with the other Demand Side Programme was returned or relinquished under:
 - 1. clause 4.13A.19 by operation of clause 4.13A.18; or
 - 2. clause 4.13A.24.
- 2.29.5F. If AEMO accepts an application under clause 2.29.5D then AEMO must include in its notification to the <u>applicant</u> <u>applicant</u>:
 - (a) the date and time from which the relevant Load will be associated with the Demand Side Programme or Interruptible Load, as applicable, as defined under clause 2.29.5G(a); and
 - (b) the date and time from which the relevant Load will cease to be associated with the Demand Side Programme <u>or Interruptible Load, as applicable</u>, as defined under clause 2.29.5G(b).

- 2.29.5G If AEMO accepts an application submitted under clause 2.29.5B then AEMO must associate the relevant Load ("Associated Load") with the Demand Side Programme for the period ("Association Period") between:
 - (a) the later of:
 - i. the start of the Trading Day commencing on the contract start date provided under clause 2.29.5B(d); and
 - ii. the start of the Trading Day following the day that AEMO notifies the applicant of its decision under clause 2.29.5D; and
 - (b) the end of the Trading Day starting on the contract end date provided under clause 2.29.5B(e).
- 2.29.5H. If AEMO rejects an application submitted under clause 2.29.5B, then AEMO must include in its notification to the applicant under clause 2.29.5D the reasons for the rejection of the application. A Market Customer Participant whose application is rejected may reapply to associate a Non-Dispatchable Load with a Demand Side Programme or an Interruptible Load with a Demand Side Programme under clause 2.29.5B.
- 2.29.51. A Market Customer Participant with an Associated Load may apply to AEMO to:
 - (a) cancel the association of the relevant Load with the Demand Side Programme or Interruptible Load, as applicable; or
 - (b) reduce the Association Period of the Associated Load.
- 2.29.5J. AEMO must within one Business Day notify an applicant of the receipt of an application submitted under clause 2.29.5l.
- 2.29.5K. AEMO must determine whether to accept or reject an application submitted under clause 2.29.5I and notify the applicant of its decision within two Business Days of the receipt of the application. AEMO must accept the application unless the proposed change would affect the association of the relevant Load with the Demand Side Programme or Interruptible Load, as applicable, during any period before the Trading Day commencing on the third Business Day after the receipt of the application.
- 2.29.5L. If AEMO accepts an application submitted under clause 2.29.5I then it must either:
 - (a) cancel the association of the relevant Load with the Demand Side Programme or Interruptible Load, as applicable; or
 - (b) reduce the Association Period of the Associated Load, as requested in the application.
- 2.29.5LA. If AEMO becomes aware that information of the type listed in clause 2.29.5B regarding an Associated Load differs from that provided under clause 2.29.5B or previously the subject of a redetermination under this clause 2.29.5LA ("New Contract Information"), then AEMO must make a fresh determination under

clause 2.29.5D taking into account the New Contract Information, as a result of which AEMO must, as appropriate—as appropriate

- (a) reduce the Associated Load's Association Period; or
- (b) take other measures in respect of the Associated Load including cancelling its association; or
- (c) make no change to its previous determination or redetermination.
- 2.29.5LB. AEMO may from time to time request a Market Customer Participant with a Demand Side Programme or an Interruptible Load to provide evidence to AEMO's reasonable satisfaction that information provided under clause 2.29.5B or previously the subject of an adjustment under clause 2.29.5LA, remains accurate, and the Market Customer Participant must comply as soon as reasonably practicable and in any event within 10 Business Days of the request.
- 2.29.5LC. If AEMO takes action under clause 2.29.5LA(a) or <u>clause 2.29.5LA(b)</u>, it must notify the Market <u>Customer Participant</u> of the action and its reasons within five Business Days after the action.
- 2.29.5M. If AEMO rejects an application submitted under clause 2.29.5I, then AEMO must include in its notification to the applicant under clause 2.29.5K the reasons for the rejection of the application.

2.29.5N. [Blank]

2.29.50. [Blank]

- 2.29.6. [Blank] A Rule Participant must ensure that a Scheduled Generator registered by that Rule Participant is able to respond to instructions from AEMO to increase or decrease output.
- 2.29.7. [Blank] A Rule Participant must ensure a Non-Scheduled Generator registered by that Rule Participant is able to respond to instructions from AEMO to decrease output.

2.29.8. [Blank]

- 2.29.8 In determining whether or not the relevant Facility is to be registered as a

 Scheduled Facility or a Semi-Scheduled Facility referred in clause 2.29.1A, AEMO

 must base the decision on the extent to which relevant Facility is controllable such that:
 - (a) a Scheduled Facility must be able to respond to Dispatch Instructions from AEMO to increase and decrease output by controlling its output within Tolerance Range for a specified period;
 - (b) a Semi-Scheduled Facility does not have to control its output within

 Tolerance Range for a specified period; however, the Facility must be able to respond to AEMO Dispatch Instructions to decrease output.

- 2.29.8A. A Rule Participant must ensure that an Interruptible Load registered by that Rule Participant is equipped with an interval meter.
- 2.29.9. AEMO may determine that a person is exempted from the requirement to register a Facility in accordance with this <u>clause section</u> 2.29. An exemption may be given subject to any conditions that AEMO considers appropriate.

New clause 2.29.9A that specifies AEMO must develop a WEM Procedure on how AEMO must determine a Facility's controllability based on how reliably a Facility can follow AEMO's Dispatch Instructions.

2.29.9A(d) outlines the processes and procedures to be followed by AEMO and Market Participants for a Load to be eligible to be registered as a Scheduled Load, including the assessment criteria AEMO will apply in determining the level of controllability of the Load.

2.29.9A AEMO must develop a WEM Procedure specifying:

- (a) how AEMO must assess a Facility's controllability based on how reliably it can follow AEMO's Dispatch Instructions within a Tolerance Range;
- (b) when determining reliability under clause 2.29.10(a), AEMO must take into account:
 - i. how accurately a Facility is able to follow a Dispatch Instruction;
 - ii. how frequently a Facility is able to follow a Dispatch Instruction within Tolerance Range; and
 - iii. the period of time over which the Facility can control its output.
- (c) when assessing whether a Facility is controllable, AEMO may consider:
 - i. the size and/or nameplate capacity of different components of the Facility;
 - ii. whether the Facility is primarily a supply-side or demand-side facility based on its components; and
 - iii. the fuel used.
- (d) the processes and procedures to be followed by AEMO and Market

 Participants for a Load to be eligible to be registered as a Scheduled Load,
 including the assessment criteria AEMO will apply in determining the level
 of controllability of the Load.

Explanatory Note

Existing clauses 2.29.10 and 2.29.11 will be moved to section 2.30B Intermittent Loads and will be reviewed in early 2021. Any proposed amendments shown in the base clause in these Amending Rules are placeholder amendments only.

2.29.10 On request, AEMO must exempt a person from the requirement to register a generating producing system in accordance with this clause 2.29 if that generating energy producing system is identified by that person as supplying an Intermittent

Load in accordance with clause 2.30B.2 and that generating energy producing system satisfies all the requirements of these WEM Rules to serve Intermittent Load.

2.29.11 With respect to the registration of a generation system to serve Intermittent Load, not more than one generation system may be registered for each Intermittent Load.

Explanatory Note

Drafting amendments to section 2.30 Facility Aggregation, Section 2.30B Intermittent Loads, and Section 2.30C Rule Commencement and Registration Data will be progressed in early 2021.

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2.31. Registration Process

Explanatory Note

Drafting amendments to section 2.31 (Registration Process) will be made in early 2021, however the following key changes are expected to be made to streamline and clarify the registration process.

Registration

New facilities:

- Where a new participant enters the Reserve Capacity Mechanism, its energy producing system be assessed as per Facility Technology Types for the purposes of determining the relevant capacity certification methodology.
- Within the first year of the Reserve Capacity Cycle, the intending participant's energy producing system will also be assessed by AEMO on the basis of system size and controllability and assigned an indicative Facility Class.
- AEMO will issue a certificate of registration to that participant in respect to its energy producing system indicating that the Market Participant and its energy producing system is registered for the purposes of the WEM Rules.
- If, for any reason, the energy producing system is changed (for example, it does not get built, or system size is changed, or controllability requirements change), the certificate of registration will be automatically invalidated and a re-assessment for a different Facility Class will be undertaken by AEMO.

Existing facilities:

• Existing energy producing systems holding a certificate of registration will continue in the assigned Facility Class unless, for any reason, any changes are planned to be made that may trigger a re-assessment for a different Facility Class.

Suspension and deregistration

No major drafting amendments are planned to the suspension and deregistration process under the WEM Rules.

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11. Glossary

<u>Electric Storage Resource</u>: A system or resource capable of receiving electric energy from a Network and storing it for later injection of electric energy back to a Network.

Explanatory Note

The definition of a Facility will be holistically reviewed in early 2021 as part of the Registration workstream. In the current Tranche-2 and Tranche-3 Amending Rules, Facility and Registered Facility have been used interchangeably.

Facility: Any of the facilities described in clause 2.29.1.

Facility Classes: Any one of the classes of Facility specified in clause 2.29.1A.

Facility Technology Types: Means any one of the types of technologies specified in clause 2.29.1.

Intermittent Generator: A Non-Scheduled Generator_that cannot be scheduled because its output level is dependent on factors beyond the control of its operator (e.g. wind).

Intermittent Generating System: A generating system from which energy production is not readily predictable, including, without limitation, solar generators, wave turbine generators and wind turbine generators.

Load: Has the meaning given in clause 2.29.1(d).

Load: An electricity consuming resource or device or group of resources of devices which is not an Electric Storage Resource.

Market Participant: A Rule Participant that is a Market Generator or a Market Customer.

Market Participant: A Rule Participant that is registered in accordance with section 2.28.

Non-Dispatchable Load: A Load which is not an Interruptible Load.

Non-Dispatchable Load: An unregistered facility, that is not a Scheduled Load, that may be associated with a Demand Side Programme or an Interruptible Load.

New RCM Transition Date: The date on which the 2021 Reserve Capacity Cycle commences.

Non-Intermittent Generating System: A generation system which is not an Intermittent Generating System, including, without limitation, thermal generators fuelled by coal, natural gas, or distillate.

Non-Scheduled Generator Facility: A generation system Registered Facility that can be self-scheduled by its operator (with the exception that System Management AEMO can require it to decrease its output subject to its physical capabilities) and which is registered as a Non-Scheduled Generator Facility in accordance with clauses 2.29.4(a) or 2.29.4(d) clause 2.29.4.

Scheduled Generator: A generation system that can increase or decrease the quantity of electricity it generates and sends out into a network forming part of the SWIS (subject to limits on its physical capabilities) in response to instructions from System Management and is registered as such in accordance with clause 2.29.4(b) and (c).

<u>Scheduled Facility</u>: A Facility that can increase or decrease its Injection or Withdrawal guantity to or from the SWIS in response to instructions from AEMO and is registered as such in accordance with clauses 2.29.5(b) and 2.29.5(c).

<u>Scheduled Load</u>: An electricity consuming resource or device or group of resources or devices which is controllable for dispatch purposes.

<u>Semi-Scheduled Facility</u>: A Facility that can decrease its Injection or Withdrawal quantity to or from the SWIS in response to instructions from AEMO and is registered as such in accordance with clause 2.29.1A.

Explanatory Note

The definition of Small DER Aggregation as a Facility Technology Type needs further holistic review with the RCM workstream and has been omitted from these Amending Rules.

The proposed definition for 'System Size' reflects the intent of the policy. However, in the final version of these Amending Rules, the calculation of the quantity may be moved to section 2.28 and the definition amended accordingly.

<u>System Size</u>: Means, in respect of a Facility, the sum over all energy producing systems at that Facility being a quantity equal to (calculated for each energy producing system):

- (a) <u>if the energy producing system can ramp down from maximum output to</u> <u>maximum off-take or ramp up from maximum offtake to maximum output</u> <u>within 0.02 seconds, then:</u>
 - i. the energy producing system's maximum output; less
 - <u>ii.</u> the energy producing system's maximum offtake (where off-take represents consumption and is denoted as a negative quantity); or
- (b) otherwise, the energy producing system's maximum output.