National Electricity Amendment (Primary frequency response incentive arrangements) Rule 2022 No. 8

under the National Electricity Law to the extent applied by:

(a) the National Electricity (South Australia) Act 1996 of South Australia;

(b) the Electricity (National Scheme) Act 1997 of the Australian Capital Territory;

(c) the Electricity - National Scheme (Queensland) Act 1997 of Queensland;

(d) the Electricity - National Scheme (Tasmania) Act 1999 of Tasmania;

(e) the National Electricity (New South Wales) Act 1997 of New South Wales;

(f) the National Electricity (Victoria) Act 2005 of Victoria;

(g) the National Electricity (Northern Territory) (National Uniform Legislation) Act 2015 of the Northern Territory; and

(h) the Australian Energy Market Act 2004 of the Commonwealth.

The Australian Energy Market Commission makes the following Rule under the National Electricity Law.

Anna Collyer
Chairperson
Australian Energy Market Commission

National Electricity Amendment (Primary frequency response incentive arrangements) Rule 2022 No. 8

1 Title of Rule

This Rule is the *National Electricity Amendment (Primary frequency response incentive arrangements) Rule 2022 No. 8*.

2 Commencement

Clause 7 of this Rule commences operation on 8 September 2022.

Schedules 1, 3 and 4 of this Rule commence operation on 8 September 2022.

Schedule 2 of this Rule commences operation on 8 June 2025.

3 Amendment to the National Electricity Rules

The National Electricity Rules are amended as set out in Schedule 1.

4 Amendment to the National Electricity Rules

The National Electricity Rules are amended as set out in Schedule 2.

5 Amendment to the National Electricity Amendment (Fast frequency response market ancillary service) Rule 2021

The *National Electricity Amendment (Fast frequency response market ancillary service) Rule 2021* is amended as set out in Schedule 3.

6 Savings and Transitional Amendment to the National Electricity Rules

The National Electricity Rules are amended as set out in Schedule 4.

7 Revocation of Schedule 2 of the National Electricity Amendment (Mandatory primary frequency response) Rule 2020

Schedule 2 of the *National Electricity Amendment (Mandatory primary frequency response) Rule 2020 No. 5* is revoked.

Schedule 1   Amendment to the National Electricity Rules

(Clause 3)

[1]   Clause 4.4.2   Operational frequency control requirements

In clause 4.4.2(c1), after "*dispatch instruction*" insert "in accordance with clause 4.9.2".

[2]   Clause 4.8.16   AEMO reporting on frequency reporting

After clause 4.8.16(b)(1), insert:

> (1A)   *AEMO's* assessment of the level of aggregate *frequency* responsiveness in the *power system* provided by *frequency* responsive *plant* in each *region*;

Schedule 2   Amendment to the National Electricity Rules

(Clause 4)

[1] Clause 3.11.2A   AER reporting on market ancillary services markets

In clause 3.11.2A(b)(1)(iii), omit "; and" and substitute ";".

[2] Clause 3.11.2A   AER reporting on market ancillary services markets

In clause 3.11.2A(b)(1)(iv), after ";" insert "and".

[3] Clause 3.11.2A   AER reporting on market ancillary services markets

In clause 3.11.2A(b)(1), after paragraph (iv), insert:

> (v) the total amounts paid to a *Cost Recovery Market Participant* in accordance with clause 3.15.6AA(b).

[4] Clause 3.15.6A   Ancillary service transactions

In clause 3.15.A(a0), omit the definition of "**Scheduled Participant**".

[5] Clause 3.15.6A   Ancillary service transactions

Omit clause 3.15.6A(h) and substitute:

> (h) The total amount calculated by *AEMO* under paragraph (a) for the *regulating raise service* or the *regulating lower service* in respect of each *trading interval* must be allocated by *AEMO* to each *region* in accordance with the following procedure and the information provided under clause 3.9.2A(b):
>
> (1) allocate on a pro-rata basis for each *region* and for the relevant *trading interval* the proportion of the total amount calculated by *AEMO* under paragraph (a) for the *regulating raise service* and *regulating lower service* between *global market ancillary service requirements* and *local market ancillary service requirements* to the respective marginal prices for each such service; and
>
> (2) calculate for the relevant *trading interval* the sum of the costs of the *regulating raise service* or the *regulating lower service* for each *global market ancillary service requirement* for all *regions*, and the *regulating raise service* or the *regulating lower service* for each *local market ancillary service requirement* for all relevant *regions*, as determined under subparagraph (1); and

(3) allocate for each *trading interval* the costs of the *global market ancillary service requirements* and *local market ancillary service requirements* calculated in subparagraph (2) in accordance with clauses 3.15.6AA(c) and (d).

[6] Clause 3.15.6A Ancillary service transactions

Omit clause 3.15.6A(i) and substitute:

(i) When *AEMO* dispatches a quantity of *regulating raise service* or *regulating lower service* in addition to the quantity it determines in accordance with the *dispatch algorithm*, *AEMO* must:

(1) for the purposes of paragraphs (f) and (g), include the additional quantity in the cost of *delayed services*; and

(2) for the purposes of paragraphs (h) and clauses 3.15.6AA(c) and (d), exclude the additional quantity from the cost of *regulation services*,

taking into account the requirements in clauses 3.8.1(a) and (b) to maximise the value of *spot market* trading.

[7] Clause 3.15.6A Ancillary service transactions

Omit clauses 3.15.6A(j) to (p).

[8] Clause 3.15.6AA New clause

Omit clause 3.15.6AA and substitute:

3.15.6AA Frequency performance payments and cost recovery for regulation services

Definitions

(a) In this clause:

appropriate metering means metering to allow an eligible unit's individual contribution to the deviation in the *frequency* of the *power system* to be assessed, in accordance with the requirements set out in the frequency contribution factors procedure.

eligible unit means a *scheduled generating unit*, a *semi-scheduled generating unit*, a *scheduled bidirectional unit*, a *scheduled load*, an *ancillary service unit*, a *non-scheduled generating unit*, a *non-scheduled bidirectional unit* or a *market connection point* for a *non-scheduled load*.

frequency contribution factors procedure means the procedure developed and *published* by *AEMO* in accordance with paragraph (f).

Trading amount calculation for frequency performance payments

(b)   In each *trading interval* in relation to:

(1)   each eligible unit which has appropriate metering, an *ancillary services transaction* occurs, which results in a *trading amount* for the relevant *Cost Recovery Market Participant* determined in accordance with the following formula:

$$TA = CF \times \frac{P_{regulation}}{12} \times RCR$$

for each *trading interval* for each *global market ancillary service requirement* and each *local market ancillary service requirement*, where:

TA (in $)	=	the *trading amount* payable or receivable by the *Cost Recovery Market Participant*;
CF (a number)	=	the contribution factor for the eligible unit determined by *AEMO* under paragraph (e) for the relevant *trading interval* and relevant to the *global market ancillary service requirement* or *local market ancillary service requirement* for *regulating raise service* or *regulating lower service*;
$P_{regulation}$ (in $ per MW per hour)	=	the marginal price of meeting the *global market ancillary service requirement* or *local market ancillary service requirement* for the *regulating raise service* or *regulating lower service* in that *trading interval*;
RCR (in MW)	=	the requirement for corrective response determined by *AEMO* under subparagraph (g)(6)(i).

(2)   each eligible unit which does not have appropriate metering, an *ancillary services transaction* occurs, which results in a *trading amount* for the relevant *Cost Recovery Market Participant* determined in accordance with the following formula:

$$TA = RCF \times \frac{P_{regulation}}{12} \times RCR \times \frac{TE}{ATE}$$

for each *trading interval* for each *global market ancillary service requirement* and each *local market ancillary service requirement*, where:

TA (in $)	=	the *trading amount* payable or receivable by the *Cost Recovery Market Participant*;
RCF (a number)	=	the residual contribution factor for eligible units that do not have appropriate metering, for the relevant *trading interval* and relevant to the *global market ancillary service requirement* or *local market ancillary service requirement* for the *regulating raise service* or *regulating lower service*, having regard to the principle in paragraph (f)(4);
$P_{regulation}$ (in $ per MW per hour)	=	has the meaning given in subparagraph (1);
RCR (in MW)	=	has the meaning given in subparagraph (1);
TE (in MWh)	=	the sum of the absolute value of any *adjusted gross energy* amount, for the *Cost Recovery Market Participant* for an eligible unit that does not have appropriate metering, for the *trading interval* in the *region* or *regions* relevant to the *global market ancillary service requirement* or *local market ancillary service requirement* for the *regulating raise service* or *regulating lower service*; and
ATE (in MWh)	=	the aggregate of the absolute value of *adjusted gross energy* amounts for all *Cost Recovery Market Participants*, for eligible units that do not have appropriate metering, for the *trading interval* for the *region* or *regions* relevant to the *global market ancillary service requirement* or *local market ancillary service requirement* for the *regulating raise service* or *regulating lower service*.

Cost recovery for regulation services used

(c)   In each *trading interval* in relation to:

(1)   each eligible unit which has appropriate metering, an *ancillary services transaction* occurs, which results in a *trading amount* for the relevant *Cost Recovery Market Participant* determined in accordance with the following formula:

$$TA = TSFCAS \times U \times NCF$$

for each *trading interval* for each *global market ancillary service requirement* and each *local market ancillary service requirement*, where:

TA (in $)	=	the *trading amount* payable by the *Cost Recovery Market Participant*;
TSFCAS (in $)	=	each amount calculated by *AEMO* under clause 3.15.6A(h)(2) for the *regulating raise service* or the *regulating lower service* in respect of a *trading interval*;
U (a number)	=	the usage determined by *AEMO* under subparagraph (g)(6)(ii); and
NCF (a number)	=	the negative contribution factor for the eligible unit determined by *AEMO* under paragraph (e) for the relevant *trading interval* and the *region* or *regions* relevant to the *global market ancillary service requirement* or *local market ancillary service requirement* for the *regulating raise service* or *regulating lower service*.

(2)   each eligible unit for which the *trading amount* is not calculated in accordance with the formula in subparagraph (1), an *ancillary services transaction* occurs, which results in a *trading amount* for the relevant *Cost Recovery Market Participant* determined in accordance with the following formula:

$$TA = TSFCAS \times U \times NRCF \times \frac{TE}{ATE}$$

for each *trading interval* for each *global market ancillary service requirement* and each *local market ancillary service requirement*, where:

TA (in $)	=	has the meaning given in subparagraph (1);
TSFCAS (in $)	=	has the meaning given in subparagraph (1);
U (a number)	=	has the meaning given in subparagraph (1);
NRCF (a number)	=	the negative residual contribution factor for all eligible units that do not have appropriate metering, for the relevant *trading interval* and the *region* or *regions* relevant to the *global market ancillary service requirement* or *local market ancillary service requirement* for the *regulating raise service* or *regulating lower service*, having regard to the principle in paragraph (f)(4);
TE (in MWh)	=	has the meaning given in subparagraph (b)(2); and
ATE (in MWh)	=	has the meaning given in subparagraph (b)(2).

Cost recovery for regulation services not used

(d)   In each *trading interval* in relation to:

(1)   each eligible unit which has appropriate metering, an *ancillary services transaction* occurs, which results in a *trading amount* for the relevant *Cost Recovery Market Participant* determined in accordance with the following formula:

$$TA = TSFCAS \times (1 - U) \times DCF$$

for each *trading interval* for each *global market ancillary service requirement* and each *local market ancillary service requirement*, where:

TA (in $)	=	the *trading amount* payable by the *Cost Recovery Market Participant*;
TSFCAS (in $)	=	has the meaning given in paragraph (c)(1);

U (a number)	=	has the meaning given in paragraph (c)(1); and
DCF (a number)	=	the default contribution factor for the eligible unit determined by *AEMO* under subparagraph (g)(4) for the relevant *trading interval* and the *region* or *regions* relevant to the *global market ancillary service requirement* or *local market ancillary service requirement* for the *regulating raise service* or *regulating lower service*.

(2)   each eligible unit for which the *trading amount* is not calculated in accordance with the formula in subparagraph (1), an *ancillary services transaction* occurs, which results in a *trading amount* for the relevant *Cost Recovery Market Participant* determined in accordance with the following formula:

$$TA = TSFCAS \times (1 - U) \times DRCF \times \frac{TE}{ATE}$$

for each *trading interval* for each *global market ancillary service requirement* and each *local market ancillary service requirement*, where:

TA (in $)	=	has the meaning given in subparagraph (1);
TSFCAS (in $)	=	has the meaning given in subparagraph (1);
U (a number)	=	has the meaning given in subparagraph (1);
DRCF (a number)	=	the default residual contribution factor for the eligible unit determined by *AEMO* under subparagraph (g)(4)(ii) for the relevant *trading interval* and the *region* or *regions* relevant to the *global market ancillary service requirement* or *local market ancillary service requirement* for the *regulating raise service* or *regulating lower service*;
TE (in MWh)	=	has the meaning given in subparagraph (b)(2); and

ATE (in MWh)	=	has the meaning given in subparagraph (b)(2).

Frequency contribution factors procedure

(e)   *AEMO* must determine, in accordance with the frequency contribution factors procedure, a contribution factor (which may be positive or negative) for each eligible unit for the purposes of clauses 3.15.6A(i) and 3.15.6AA(a) and (b).

(f)   *AEMO* must develop, *publish* on its website, and may amend from time to time, in accordance with the *Rules consultation procedures*, the frequency contribution factors procedure for determining contribution factors for use in paragraph (e), taking into account the following principles:

   (1)   a negative contribution factor for an eligible unit should reflect the extent to which the unit contributed to increasing the deviation in *frequency* of the *power system*;

   (2)   a positive contribution factor for an eligible unit should reflect the extent to which the unit contributed to reducing the deviation in *frequency* of the *power system*;

   (3)   a contribution factor is a number between -1 and 1;

   (4)   the residual contribution factor for all eligible units that do not have appropriate metering must be equal across and within all classes of *Cost Recovery Market Participant*;

   (5)   separate contribution factors must be determined with respect to the contribution to the need to raise or lower the *frequency* of the *power system*;

   (6)   a contribution factor for each eligible unit must be determined by *AEMO* for every *trading interval* unless in *AEMO*'s reasonable opinion it is impractical to do so, in which case *AEMO* must determine a default contribution factor;

   (7)   a contribution factor for each eligible unit applies for the *region* or *regions* relevant to the *global market ancillary service requirement* or *local market ancillary service requirement* for the *regulating raise service* or *regulating lower service*;

   (8)   a default contribution factor for an eligible unit must be determined based on historical data for that eligible unit unless in *AEMO*'s reasonable opinion it is impractical to do so; and

(9) a default contribution factor must only be used in paragraph (b) to determine the *trading amount* payable by a *Cost Recovery Market Participant*.

(g) *AEMO* must include in the frequency contribution factors procedure:

(1) the criteria for determining whether an eligible unit has appropriate metering;

(2) a formula that *AEMO* will use in each *trading interval* to calculate the measure of the need to raise or lower the *frequency* of the *power system*, in order to determine a contribution factor under paragraph (e), which:

(i) must be based on the *frequency* of the *power system* in the relevant *region* or *regions*;

(ii) must contain sufficient detail so that a *Cost Recovery Market Participant* can use it to estimate the need to raise or lower the *frequency* of the *power system* during each *trading interval*; and

(iii) may include parameters to be determined by *AEMO* from time to time to be applied to the different elements of the formula;

(3) the methodology *AEMO* will use to determine a contribution factor to apply to an eligible unit which reflects the relevant *Cost Recovery Market Participant's* contribution to the deviation in *frequency* of the *power system*;

(4) the methodology *AEMO* will use to determine default contribution factors to apply to an eligible unit:

(i) under paragraph (b) to determine the *trading amount* payable by a *Cost Recovery Market Participant* or paragraph (c), where it is impractical for *AEMO* to determine a contribution factor for that unit in a *trading interval* based on the data measured for that *trading interval* under subparagraph (f)(8);

(ii) for the allocation of costs of any *enabled regulating raise service* or *enabled* regulating lower service that was not used by *AEMO* in that *trading interval* under paragraph (d); and

(5) the data *AEMO* will use to calculate the contribution factor for an eligible unit with appropriate metering, which must include the unit's *active power* output or consumption and a measure of *frequency*, and may include:

(i) the *frequency* measured at the *connection point* for the eligible unit; and

(ii) any other data *AEMO* considers relevant.

(6) the methodology *AEMO* will use to determine:

(i) the requirement for corrective response under subparagraph (b)(1), which is a measure of the total volume in MW that contributed to reducing the deviation in *frequency* of the *power system*. This methodology may include parameters to be determined by *AEMO* from time to time to be applied in determining the requirement for corrective response; and

(ii) the usage under subparagraph (c)(1), which is the proportion of *enabled regulating raise service* or *regulating lower service* that contributed to reducing the deviation in *frequency* of the *power system*,

relevant to the *global market ancillary service requirement* or *local market ancillary service requirement* for the *regulating raise service* or *regulating lower service*; and

(7) the methodology *AEMO* will use to determine a reference trajectory in each *trading interval* for each eligible unit which has appropriate metering, which must be informed by:

(i) the *dispatch* target for a *scheduled generating unit*, *scheduled load*, *scheduled bidirectional unit* and *ancillary service unit* at the end of the previous *trading interval* and at the end of the relevant *trading interval*;

(ii) the *dispatch* level for a *semi-scheduled generating unit* at the end of the previous *trading interval* and at the end of the relevant *trading interval*; and

(iii) where practical, any information provided by a *Registered Participant* for a *non-scheduled generating unit* or *non-scheduled bidirectional unit* that relates to its expected trajectory over the *trading interval*,

and may be informed by any other factors *AEMO* considers relevant.

(h) *AEMO* may make minor or administrative amendments to the frequency contribution factors procedure without complying with the *Rules consultation procedures*.

Publication requirements

(i) *AEMO* must *publish* any data that will be used to determine default contribution factors under subparagraph (g)(4) at least 5 *days* before the *billing period* in which the contribution factor will apply.

(j)   *AEMO* must *publish* any parameters it determines under paragraph (g)(2) and (g)(6) at least 5 *business days* prior to applying those parameters.

(k)   *AEMO* must *publish*, as soon as practicable after the relevant *trading interval*:

(1)   the contribution factors determined in accordance with paragraph (e);

(2)   the data calculated from applying the formula referred to in paragraph (g)(2);

(3)   the requirement for corrective response determined under subparagraph (g)(6)(i); and

(4)   the usage determined under subparagraph (g)(6)(ii).

(l)   *AEMO* must *publish* the data used to determine the contribution factors for the *transactions* referred to in paragraphs (b), (c) and (d) including the measured data for each eligible unit which has appropriate metering, in accordance with the *timetable*.

[9] Chapter 10   Glossary

In the definition of "***trading amount***", after "3.15.6A" insert ", 3.15.6AA".

Schedule 3   Amendment to the National Electricity (Fast frequency response market ancillary service) Rule 2021

(Clause 5)

[1] Clause 4.8.16   AEMO reporting on frequency performance

In Schedule 1 of the *National Electricity Amendment (Fast frequency response market ancillary service) Rule 2021*, omit item 8 and substitute:

In clause 4.8.16(b), after subparagraph (1A), insert:

> (1B)   the basis on which *AEMO* determined the quantity and type of any *market ancillary service* or combination of *market ancillary services*, procured by *AEMO* in order to improve *power system frequency* control outcomes, including, to the extent that is relevant, the relationship between the volume of the *market ancillary services* procured and the levels of *inertia* in the *power system*;

Schedule 4   Savings and Transitional Amendment to the National Electricity Rules

(Clause 6)

[1]   Clause 11.122.2   Interim Primary Frequency Response Requirements

After clause 11.122.2(d), insert the following note:

> **Note**
>
> The obligations on *AEMO* to publish the Primary Frequency Response Requirements under clause 4.4.2A(a) are now subject to clause 11.152.2(b).

[2]   Chapter 11   Savings and Transitional Amendments to the National Electricity Rules

After Part ZZZZZA, insert:

Part ZZZZZB   Primary frequency response incentive arrangements

11.152   Rules consequential on the making of the National Electricity Amendment (Primary frequency response incentive arrangements) Rule 2022

11.152.1 Definitions

For the purposes of this rule 11.152:

Amending Rule means the National Electricity Amendment (Primary frequency response incentive arrangements) Rule 2022.

Commencement date means 8 June 2025.

new clause 3.15.6AA(f) means clause 3.15.6AA(f) of the *Rules* as in force on and from the Commencement date.

old clause 3.15.6A(k) means clause 3.15.6A(k) of the *Rules* as in force immediately before the Commencement date.

11.152.2 Primary Frequency Response Requirements

(a)   Despite clause 11.122.2(d), the interim Primary Frequency Response Requirements developed and published by *AEMO* in accordance with clause 11.122.2(a) will continue to apply until the *Primary Frequency Response Requirements* are made and published under paragraph (b).

(b)   *AEMO* must develop and publish the *Primary Frequency Response Requirements* under clause 4.4.2A(a) by 8 May 2023.

11.152.3 Frequency Contribution Factors Procedure

(a)   *AEMO* must develop and publish the first frequency contribution factors procedure required under new clause 3.15.6AA(f) by 8 June 2023.

(b)   On and from the Commencement date the frequency contribution factors procedure developed and published under new clause 3.15.6AA(f) will replace the procedure prepared and published by *AEMO* under old clause 3.15.6A(k) in its entirety, and that procedure will no longer apply.

[END OF RULE AS MADE]