



## **Draft National Electricity Amendment (Primary frequency response incentive arrangements) Rule 2021**

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

## **Draft National Electricity Amendment (Primary frequency response incentive arrangements) Rule 2021**

### **1 Title of Rule**

This Rule is the *Draft National Electricity Amendment (Primary frequency response incentive arrangements) Rule 2021*.

### **2 Commencement**

Paragraph 6 of this Rule commences operation on [date this rule is made].

Schedules 1 and 3 of this Rule commence operation on [date this rule is made].

Schedule 2 of this Rule commences operation on [2 years and 3 months from the date this rule is made].

### **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 Savings and Transitional Amendment to the National Electricity Rules**

The National Electricity Rules are amended as set out in Schedule 3.

### **6 Revocation of Schedule 2 of the Mandatory primary frequency response rule**

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 4.8.16      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*;

### **[2] 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 set out in clause 11.[XXX].2(b).

## 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 costs of *frequency performance payments* for each *region*.

### [4] 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* 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 each *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 each *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 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 paragraph (i).

## [5] Clause 3.15.6A Ancillary service transactions

Omit clauses 3.15.6A(i) to (o) and substitute:

### Cost recovery for regulation services

- (i) In each *trading interval* in relation to:
- (1) each *Market Participant* which has metering to allow their individual contribution to the aggregate deviation in *frequency* of the *power system* to be assessed, an *ancillary services transaction* occurs, which results in a *trading amount* for that *Market Participant* determined in accordance with the following formula:

$$TA = \text{the aggregate of} \left( TSFCAS \times \frac{NMPF}{NAMPF} \times \min \left( \frac{RR}{EA}, 1 \right) \right) \times -1$$

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

- TA (in \$) = the *trading amount* to be determined (which is a negative number);
- TSFCAS (in \$) = each amount calculated by *AEMO* under paragraph (h)(2) for the *regulating raise service* or the *regulating lower service* in respect of a *trading interval*;
- NMPF (a number) = the contribution factor for the relevant *trading interval* set by *AEMO* for the *Market Participant* under paragraph (j) for the *region* or *regions* relevant to the *regulating raise service* or *regulating lower service* (which is a negative number);
- NAMPF (a number) = the aggregate of the NMPF values for all *Market Participants* for the *trading interval* for the *region* or *regions* relevant to the *regulating raise service* or *regulating lower service* (which is a negative number);
- EA (in MW) = the total amount of the relevant *regulating raise service* or *regulating lower service* which has been *enabled* in a *trading interval*; and
- RR (in MW) = the amount of the relevant *regulating raise service* or *regulating lower service* required

by *AEMO* in that *trading interval*.

or

- (2) in relation to each *Market Participant* for whom 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 that *Market Participant* determined in accordance with the following formula:

$$TA = \text{the aggregate of} \left( TSFCAS \times \frac{RMPF}{NAMPF} \times \min \left( \frac{RR}{EA}, 1 \right) \times \frac{TE}{ATE} \right) \times -1$$

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

- TA (in \$) = the *trading amount* to be determined (which is a negative number);
- TSFCAS (in \$) = has the meaning given in subparagraph (1);
- RMPF (a number) = the aggregate residual contribution factor for the relevant *trading interval* set by *AEMO* for the *Market Participants* under paragraph (j) for whom the *trading amount* is not calculated in accordance with the formula in subparagraph (1), for the *region* or *regions* relevant to the *regulating raise service* or *regulating lower service* (which is a negative number);
- NAMPF (a number) = has the meaning given in subparagraph (1);
- TE (in MWh) = the sum of the absolute value of any *customer energy*, *generator energy* and *small generator energy* for the *Market Participant* for the *trading interval* in the *region* or *regions* relevant to the *regulating raise service* or *regulating lower service*;
- ATE (in MWh) = the aggregate of the absolute value of *customer energy*, *generator energy* and *small generator energy* figures for all

*Market Participants*, for whom the *trading amount* is not calculated in accordance with the formula in subparagraph (1), for the *trading interval* for the *region* or *regions* relevant to the *regulating raise service* or *regulating lower service*;

EA (in MW) = has the meaning given in subparagraph (1); and

RR (in MW) = has the meaning given in subparagraph (1).

and

- (3) the total amount calculated by *AEMO* under paragraph (a) for any *enabled regulating raise service* or *enabled regulating lower service* that was not used by *AEMO* in that *trading interval* must be allocated by *AEMO* to each *Market Participant* pro-rated in proportion to the *customer energy*, *generator energy* and *small generator energy* (as the case may be) for that *Market Participant* in that *trading interval* as determined in accordance with the following formula:

$$TA = TSFCAS \times \left( 1 - \min \left( \frac{RR}{EA}, 1 \right) \right) \times \frac{TE}{ATE} \times -1$$

where:

TA (in \$) = the *trading amount* to be determined (which is a negative number);

TSFCAS (in \$) = has the meaning given in subparagraph (1);

TE (in MWh) = the sum of the absolute value of any *customer energy*, *generator energy* and *small generator energy* for the *Market Participant* for the *trading interval* in the *region* or *regions*;

ATE (in MWh) = the aggregate of the absolute value of the *customer energy*, *generator energy* and *small generator energy* figures for all *Market Participants*, for whom the *trading amount* is not calculated in accordance with the formula in

subparagraph (1), for the *trading interval* for the *region* or *regions*;

EA (in MW) = has the meaning given in subparagraph (1); and

RR (in MW) = has the meaning given in subparagraph (1).

### Frequency performance payments

(i1) In each *trading interval* in relation to:

- (1) each *Market Participant* which has metering to allow their individual contribution to the reduction of the aggregate deviation in *frequency* of the *power system* to be assessed, an *ancillary services transaction* occurs, which results in a *trading amount* for that *Market Participant* determined in accordance with the following formula:

$$TA = \text{the aggregate of} \left( TSFCAS \times \frac{PMPF}{NAMPF} \times \frac{RR}{EA} \right)$$

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

TA (in \$) = the *trading amount* to be determined (which is a positive number);

TSFCAS (in \$) = each amount calculated by *AEMO* under paragraph (h)(2) for the *regulating raise service* or the *regulating lower service* in respect of a *trading interval*;

PMPF (a number) = the contribution factor for the relevant *trading interval* set by *AEMO* for the *Market Participant* under paragraph (j) for the *region* or *regions* relevant to the *regulating raise service* or *regulating lower service* (which is a positive number);

NAMPF (a number) = the aggregate of the *NMPF* values for all *Market Participants* for the *trading interval* for the *region* or *regions* relevant to the *regulating raise service* or *regulating lower service* (which is a

negative number);

RR (in MW) = the amount of the relevant *regulating raise service* or *regulating lower service enabled* and required by *AEMO* in that *trading interval*; and

EA (in MW) = the total amount of the relevant *market ancillary service* which has been *enabled* in the *trading interval*.

- (2) in relation to each *Market Participant* for whom 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 that *Market Participant* determined in accordance with the following formula:

$$TA = \text{the aggregate of} \left( TSFCAS \times \frac{PMPF}{NAMPF} \times \frac{RR}{EA} \times \frac{TE}{ATE} \right)$$

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

TA (in \$) = the *trading amount* to be determined (which is a positive number);

EA (in MW) = has the meaning given in subparagraph (1);

TSFCAS (in \$) = has the meaning given in subparagraph (1);

PMPF (a number) = has the meaning given in subparagraph (1);

NAMPF (a number) = has the meaning given in subparagraph (1);

RR (in MW) = has the meaning given in subparagraph (1);

TE (in MWh) = the sum of the absolute value of any *customer energy*, *generator energy* and *small generator energy* for the *Market Participant* for the *trading interval* in the *region* or relevant to the *regulating raise service* or *regulating lower*

*service; and*

ATE (in MWh) = the aggregate of the absolute value of the *customer energy*, *generator energy* and *small generator energy* figures for all *Market Participants*, for whom the *trading amount* is not calculated in accordance with the formula in subparagraph (1), for the *trading interval* for the *region* or *regions* relevant to the *regulating raise service* or *regulating lower service*;

### Cost recovery for frequency performance payments

(i2) In each *trading interval* in relation to:

- (1) each *Market Participant* which has metering to allow their individual contribution to the aggregate deviation in *frequency* of the *power system* to be assessed, a *frequency performance payment cost recovery transaction* occurs, which results in a *trading amount* for that *Market Participant* determined in accordance with the following formula:

$$TA = \text{the aggregate of} \left( TFPP \times \frac{NMPF}{NAMPF} \right) \times -1$$

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

TA (in \$) = the *trading amount* to be determined (which is a negative number);

TFPP (in \$) = the total of all amounts calculated by *AEMO* under paragraph (i1) for the *frequency performance payments* in respect of a *trading interval*;

NMPF (a number) = the contribution factor for the relevant *trading interval* set by *AEMO* for the *Market Participant* under paragraph (j) for the *region* or *regions* relevant to the *regulating raise service* or *regulating lower service* (which is a negative number);

NAMPF (a number) = the aggregate of the NMPF values for all *Market Participants* for the *trading interval* for the *region* or *regions* relevant to the *regulating raise service* or *regulating lower service* (which is a negative number);

or

- (2) in relation to each *Market Participant* for whom the *trading amount* is not calculated in accordance with the formula in subparagraph (1), a *frequency performance payment cost recovery transaction* occurs, which results in a *trading amount* for that *Market Participant* determined in accordance with the following formula:

$$TA = \text{the aggregate of} \left( TFPP \times \frac{NMPF}{NAMPF} \times \frac{TE}{ATE} \right) \times -1$$

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

TA (in \$) = the *trading amount* to be determined (which is a negative number);

TFPP costs (in \$) = has the meaning given in subparagraph (1);

TE (in MWh) = the sum of the absolute value of any *customer energy*, *generator energy* and *small generator energy* for the *Market Participant* for the *trading interval* in the *region* or relevant to the *regulating raise service* or *regulating lower service*;

ATE (in MWh) = the aggregate of the absolute value of the *customer energy*, *generator energy* and *small generator energy* figures for all *Market Participants*, for whom the *trading amount* is not calculated in accordance with the formula in subparagraph (1), for the *trading interval* for the *region* or *regions* relevant to the *regulating raise service* or *regulating lower service*;

NMPF (a number) = has the meaning given in subparagraph (1); and

NAMPF (a number) = has the meaning given in subparagraph (1);

(j) *AEMO* must determine for the purpose of paragraphs (i), (i1) and (i2):

(1) a contribution factor (which may be positive or negative) for each *Market Participant* which reflects that *Market Participant's* contribution to the need for, or reduction in the need for, the *regulating raise service*;

(1A) a contribution factor (which may be positive or negative) for each *Market Participant* which reflects that *Market Participant's* contribution to the need for, or reduction in the need for, the *regulating lower service*; and

(2) if a *region* has or *regions* have operated asynchronously during the relevant *trading interval*, the contribution factors relevant to each *Market Participant* in that *region* which reflects that *Market Participant's* contribution to the need for, or reduction in the need for, the *regulating raise service* or *regulating lower service* in that *region* or *regions*,

in accordance with the procedure prepared under paragraph (k).

(k) *AEMO* must prepare and publish the *frequency contribution factors procedure* for determining contribution factors (which may be positive or negative) to apply in each *trading interval* for use in paragraph (j), taking into account the following principles:

(1) a negative contribution factor for a *Market Participant* should reflect the extent to which the *Market Participant* contributed to the need for *regulation services*;

(1A) a positive contribution factor for a *Market Participant* should reflect the extent to which the *Market Participant* helped to reduce the need for *regulation services*;

(2) the contribution factors for all *Market Participants* that do not have metering to allow their individual contribution to the aggregate need for, or reduction in the need for, *regulation services* to be assessed must be equal across and within all classes of *Market Participant*;

(2A) separate contribution factors should be determined for the *regulating raise service* and the *regulating lower service*;

(3) **[Deleted]**;

- (4) an individual *Market Participant's* contribution to the aggregate need for, or reduction in the need for, *regulation services* will be determined by *AEMO* every *trading interval* unless in *AEMO's* reasonable opinion it is impractical to do so, in which case over a period of time to be determined by *AEMO*;
- (5) **[Deleted]**;
- (6) when a *region* or *regions* are operating asynchronously:
  - (i) *AEMO* must determine contribution factors to apply for those *regions* during the period of asynchronous operation; and
  - (ii) the contribution factors determined by *AEMO* under subparagraph (i) must reflect the effect of the separation of that *region* on the control of *power system frequency* and the need for and use of *regulation services* in that *region*;
- (7) **[Deleted]**
- (k1) *AEMO* must define in the *frequency contribution factors procedure* a formula that *AEMO* will use in each *trading interval* to describe its objective for controlling the *power system frequency*. The formula must be defined in sufficient detail so that a *Market Participant* can use it to estimate the need for *regulation services* in each *trading interval*, and may include parameters to be determined by *AEMO* from time to time to be applied to the different elements of the formula.
- (k2) *AEMO* must *publish* the data calculated using the formula referred to in paragraph (k1) as soon as practicable after the *trading interval* to which it applies.
- (k3) *AEMO* must set out in the *frequency contribution factors procedure*:
  - (1) the method *AEMO* will use to determine a reference trajectory in each *trading interval* for every *scheduled generating unit*, *scheduled load*, *semi-scheduled generating unit*, *non-scheduled market generating unit*, *non-scheduled market load*, *ancillary service generating unit*, *ancillary service load*, or *network connection point* operated by a *Market Network Service Provider*, which has metering to allow its individual contribution to the aggregate deviation in *frequency* of the *power system* to be assessed; and
  - (2) how the reference trajectory referred to in paragraph (1) must be informed by:
    - (i) The *dispatch target* for a *scheduled generating unit*, *scheduled load*, *ancillary service generating unit*, *ancillary service load*, or *network connection point*

operated by a *Market Network Service Provider* 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) information provided by a *non-scheduled market participant*, that relates to its expected trajectory over the *trading interval*;

and may be informed by (where relevant):

- (i) the requirement for an *ancillary service generating unit* or *ancillary service load enabled* for a *market ancillary service*, to respond to electronic signals from *AEMO* in relation to the provision of that *market ancillary service* within the *trading interval*; and
  - (ii) any other factors *AEMO* determines to be relevant.
- (l) *AEMO* may amend the *frequency contribution factors procedure* from time to time.
  - (m) *AEMO* must comply with the *Rules consultation procedures* when making or amending the *frequency contribution factors procedure*.
  - (m1) *AEMO* may make minor or administrative amendments to the *frequency contribution factors procedure* without complying with the *Rules consultation procedures*.
  - (n) *AEMO* must *publish*, in accordance with the *timetable*, the historical data used in determining contribution factors for each *Market Participant* for the purposes of clauses 3.15.6A(h), (i), (i1) and (i2) in accordance with the *frequency contribution factors procedure*, including the measured data for each *scheduled generating unit*, *scheduled load*, *semi-scheduled generating unit*, *ancillary service generating unit*, *ancillary service load*, or *network connection point* operated by a *Market Network Service Provider* which has metering to allow its individual contribution to the aggregate deviation in *frequency* of the *power system* to be assessed.
  - (na) Notwithstanding any other provisions of the *Rules*, *AEMO* must *publish* the contribution factors determined in accordance with paragraph (j) as soon as practicable after the *relevant trading interval*.
  - (nb) **[Deleted]**
  - (nc) *AEMO* must *publish* any parameters it determines under paragraph (k1) at least 5 *business days* prior to applying those parameters in determining the formula described in paragraph (k1).

- (o) *AEMO* is not required to comply with the *Rules consultation procedures* when determining or amending the parameters referred to in paragraph (k1).

## **[6] Chapter 10            New definitions**

In Chapter 10, insert the following new definitions in alphabetical order:

### ***frequency contribution factors procedure***

The procedure developed and published by *AEMO* in accordance with clause 3.15.6A(k).

### ***frequency performance payment***

A payment made by *AEMO* to a *Market Participant* in accordance with clause 3.15.6A(i1) and the *frequency contribution factors procedure* in relation to that *Market Participant's* contribution to the reduction in the aggregate need for *regulation services* over a *trading interval*.

## Schedule 3 Savings and Transitional Amendment to the National Electricity Rules

(Clause 5)

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

After Part ZZZZ[X], insert:

#### Part ZZZZ[] Primary frequency response incentive arrangements

#### 11.[xxx] Rules consequential on the making of the National Electricity Amendment (Primary frequency response incentive arrangements) Rule 2021

##### 11.[xxx].1 Definitions

For the purposes of this rule 11.[xxx]:

**Amending Rule** means the National Electricity Amendment (Primary frequency response incentive arrangements) Rule 2021.

**Commencement date** means [date Schedule 1 of this rule commences].

**new clause 3.15.6A(k)** means clause 3.15.6A(k) 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.[xxx].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 [date which is [6] months from the date this rule is made].

##### 11.[xxx].3 Frequency Contribution Factors Procedure

- (a) *AEMO* must develop and publish the first *frequency contribution factors procedure* required under new clause 3.15.6A(k) by [date that is 9 months from the date the rule is made].
- (b) On and from the Commencement date the *frequency contribution factors procedure* 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.