

**Electricity Industry Participation (Financial Transmission  
Rights) Code Amendment 2011**

Pursuant to section 38 of the Electricity Industry Act 2010, I make the following amendments to the Electricity Industry Participation Code 2010.

At Wellington on the 8<sup>th</sup> day of August 2011



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Certified (subject to memorandum dated 8 August 2011 that accompanies this Amendment) in order for signature:



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\_\_\_ August 2011

\_\_\_ August 2011

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## Amendment

- 1 Title**  
This Amendment is the Electricity Industry Participation (Financial Transmission Rights) Code Amendment 2011.
- 2 Commencement**  
This Amendment comes into force on 1 October 2011.
- 3 Principal Code amended**  
This Amendment amends the Electricity Industry Participation Code 2010.
- 4 Interpretation**
  - (1) Clause 1.1(1) is amended by inserting the following definitions in their appropriate alphabetical order:

"**FTR** means a financial transmission right created under subpart 6 of Part 13

"**FTR account** means the trust account established by the **clearing manager** in accordance with clause 14.43A

"**FTR allocation plan** means the FTR allocation plan prepared and **published** by the **FTR manager** under clause 13.238

"**FTR auction** means an auction conducted by the **FTR manager** in accordance with the **FTR allocation plan** approved under subpart 6 of Part 13

"**FTR manager** means the **market operation service provider** who is for the time being appointed as the FTR manager for the purposes of this Code

"**FTR payment** means—

    - "(a) the amount a **participant** must pay or be paid in respect of the acquisition of an **FTR** in an **FTR auction**; or
    - "(b) if an **FTR** has been assigned by the first holder of the **FTR**, the amount that becomes payable under clause 13.249(3)



"**FTR period** means a period for which an **FTR** applies

"**FTR register** means the register created and operated by the **FTR manager** under clause 13.247

"**hub** means a **node** or group of **nodes** (and in the case of a group of **nodes**, **nodes** in the group may be given different weightings) identified as either hub A or hub B in an **FTR**

"**obligation FTR** means an **FTR** for which the terms and conditions provide that—

- "(a) (excluding any amount payable by, or to be paid to, the holder of the **FTR** in respect of the acquisition of the **FTR**) the holder of the **FTR** is entitled to receive a payment when, for the **FTR period**, the difference between the price (calculated in accordance with the terms of the **FTR**) at the **hub** identified as hub B and the price at the **hub** identified as hub A in the **FTR** is positive; and
- "(b) (excluding any amount payable for the acquisition of the **FTR**) the holder must make a payment when the difference between those prices is negative

"**option FTR** means an **FTR** for which the terms and conditions provide that—

- "(a) (excluding any amount payable by, or to be paid to, the holder of the **FTR** in respect of the acquisition of the **FTR**) the holder of the **FTR** is entitled to receive a payment when, for the **FTR period**, the difference between the price (calculated in accordance with the terms of the **FTR**) at the **hub** identified as hub B and the price at the **hub** identified as hub A in the **FTR** is positive; but
- "(b) (excluding any amount payable for the acquisition of the **FTR**) the holder is not required to make a payment when the difference between those prices is negative

"**residual loss and constraint excess** means, in respect of a **billing period**, an amount remaining in the **FTR account** that is not required to settle **FTRs** for the **billing period**, but does not include any amount that is retained for the settlement of **FTRs** in a future **billing period** in accordance with clauses 13.249(6)".

- (2) Clause 1.1(1) is amended by revoking the definition of **payee** and substituting the following definition:

"**payee** means—

- (a) a **participant** who is a **generator** or an **ancillary service agent**; or
  - (b) when receiving payment for **ancillary service administrative costs**, the **system operator**; or
  - (c) a person to whom any amount is payable under an **FTR**".
- (3) Clause 1.1(1) is amended by amending the definition of **payer** by inserting the following paragraph after paragraph (a)(iii):
  - "(iv) a person by whom any amount is payable under an **FTR**".
- 5 Contents of Part 12**  
Clause 12.1(d) is revoked.
- 6 Subpart 5 of Part 12 revoked**  
Subpart 5 of Part 12 is revoked.
- 7 Contents of Part 13**  
Clause 13.1 is amended by inserting the following paragraphs after paragraph (f):
  - "(g) the **FTR manager** prepares and **publishes** the **FTR allocation plan**, creates and allocates **FTRs**, and operates the **FTR register**; and
  - "(h) the **clearing manager** collects and allocates **FTR auction** revenue; and
  - "(i) information about **FTRs** is provided."
- 8 New subpart 6 of Part 13 inserted**  
The following subpart is inserted after clause 13.236:

"Subpart 6—Financial transmission rights

**"13.237 Contents of this subpart**

This subpart provides for the processes by which—

- "(a) the **FTR manager** prepares and **publishes** the **FTR allocation plan**; and
- "(b) the **Authority** approves the **FTR allocation plan**; and
- "(c) the **FTR manager** creates and allocates **FTRs**; and
- "(d) the **FTR manager** operates the **FTR register** and collects information from the **grid owner** and **clearing manager**; and
- "(e) **FTRs** may be assigned; and

- "(f) the **clearing manager** collects and allocates **FTR auction** revenue and collects information from the **FTR manager**; and
- "(g) the **Authority** may direct the **FTR manager** to suspend the allocation of **FTRs**.

*"FTR allocation plan*

**"13.238 Preparation and publication of FTR allocation plan**

- "(1) The **FTR manager** must prepare and **publish** an **FTR allocation plan** that complies with Schedule 13.5.
- "(2) The **FTR manager** must make the **FTR allocation plan** available to the public at no cost on the **FTR manager's** website at all reasonable times.
- "(3) Subject to subclause (4), if Schedule 13.5 is amended, the **FTR manager** must, no later than 3 months after the date on which the amendment comes into force, submit to the **Authority** for approval under clause 13.241(4), a variation to the **FTR allocation plan** to make the **FTR allocation plan** consistent with Schedule 13.5.
- "(4) The **FTR manager** is not required to comply with subclause (3) if no amendment is necessary to make the **FTR allocation plan** consistent with Schedule 13.5.

**"13.239 FTR manager gives draft FTR allocation plan to Authority**

- "(1) The **FTR manager** must submit to the **Authority** for approval a draft **FTR allocation plan** by the date specified in the **market operation service provider agreement** between the **FTR manager** and the **Authority**.
- "(2) In preparing the draft **FTR allocation plan**, the **FTR manager** must—
  - "(a) consult with persons that the **FTR manager** thinks are representative of the interests of persons likely to be substantially affected by the plan; and
  - "(b) consider submissions made on the plan.
- "(3) The **FTR manager** must provide a copy of each submission received under subclause (2) to the **Authority**.

**"13.240 Authority approves FTR allocation plan**

- "(1) The **Authority** must, as soon as practicable after receiving the draft **FTR allocation plan**, by notice in writing to the **FTR manager**—
  - "(a) approve the plan; or
  - "(b) decline to approve the plan.
- "(2) If the **Authority** declines to approve the draft **FTR allocation plan**, the **Authority** must **publish** the changes

that the **Authority** wishes the **FTR manager** to make to the draft plan.

- "(3) When the **Authority** publishes the changes that the **Authority** wishes the **FTR manager** to make to the draft **FTR allocation plan** under subclause (2), the **Authority** must **notify** the **FTR manager** and interested parties of the date by which submissions on the changes must be received by the **Authority**.
- "(4) Each submission on the changes to the draft **FTR allocation plan** must be made in writing to the **Authority** and be received on or before the date specified by the **Authority** under subclause (3).
- "(5) The **Authority** must—
  - "(a) provide a copy of each submission received to the **FTR manager**; and
  - "(b) **publish** the submissions.
- "(6) The **FTR manager** may make its own submission on the changes to the draft **FTR allocation plan** and the submissions received in relation to the changes. The **Authority** must **publish** the **FTR manager's** submission when it is received.
- "(7) The **Authority** must consider the submissions made to it on the changes to the draft **FTR allocation plan**.
- "(8) Following the consultation required by subclauses (3) to (7), the **Authority** may approve the **FTR allocation plan** subject to the changes that the **Authority** considers appropriate being made by the **FTR manager**.

#### "13.241 Variations to FTR allocation plan

- "(1) A **participant** or the **Authority** may submit a proposal for a variation to the **FTR allocation plan** to the **FTR manager**.
- "(2) The **FTR manager** must provide a copy of each proposed variation received from a **participant** under subclause (1) to the **Authority**.
- "(3) The **FTR manager** must consider a proposed variation to the **FTR allocation plan** submitted under subclause (1).
- "(4) The **FTR manager** may submit a request for a variation to the **FTR allocation plan** to the **Authority**.
- "(5) The consultation and approval requirements under clause 13.239(2) and (3) and clause 13.240 apply to a request for a variation submitted under subclause (4) as if references to the draft plan were a reference to the requested variation.
- "(6) If the **FTR manager** does not submit a request for a variation submitted under subclause (1) to the **Authority** under subclause (4), the **Authority** may consider the proposal and require the **FTR manager** to submit a

request for a variation based on the proposal to the **Authority**, and subclause (5) applies accordingly.

- "(7) The **Authority** may approve a variation requested under subclause (4) or subclause (6) without complying with the provisions referred to in subclause (5) if—
- "(a) the **Authority** considers that it is necessary or desirable in the public interest that the requested variation be made urgently; and
  - "(b) the **Authority publishes** a notice of the variation and a statement of the reasons why the urgent variation is needed.
- "(8) Every variation made under subclause (7) expires on the date that is 9 months after the date on which the variation is made.

#### *"Creation and allocation of FTRs*

##### **"13.242 FTR manager must create and allocate FTRs**

- "(1) The **FTR manager** must create and allocate **FTRs** in accordance with the **FTR allocation plan** approved under clause 13.240.
- "(2) Every **FTR** must be for 0.1MW.

##### **"13.243 Participation in FTR auction**

The **FTR manager** must not allow a person to participate in an **FTR auction** unless the **FTR manager** is satisfied that the person meets the prudential security requirements in Part 14.

##### **"13.244 Acceptance of bids in FTR auction**

- "(1) The **FTR manager** must not accept a bid in an **FTR auction** if the **FTR manager** considers that the bid, if accepted, would cause the person making the bid to incur an obligation for which it does not have sufficient acceptable security under Part 14.
- "(2) For the purposes of subclause (1), the **FTR manager** must, based on information received from the **clearing manager**, determine the maximum liability that each person can incur in respect of its bids in the auction.

#### *"Auction revenue and FTR receipts and payments*

##### **"13.245 Clearing manager must collect and allocate auction revenue**

The **clearing manager** must collect the **FTR auction** revenue and allocate it in accordance with Part 14.

**"13.246 Clearing manager must deal with FTR receipts and payments**

The **clearing manager** must deal with all receipts and payments in respect of **FTRs** in accordance with Part 14.

*"FTR register*

**"13.247 FTR manager must operate FTR register**

- "(1) The **FTR manager** must create and operate an **FTR register** that records—
- "(a) the holdings of **FTRs**; and
  - "(b) the **FTR payment** for each **FTR**; and
  - "(c) assignments of **FTRs** including any price disclosed under clause 13.249.
- "(2) The **FTR register** must contain an account for each holder of an **FTR**.
- "(3) The **FTR manager** must assign a registered number to each **FTR** recorded in the **FTR register**.
- "(4) The **FTR manager** must maintain an up to date copy of the **FTR register** and make it available to the public at no cost on the **FTR manager's** website at all reasonable times.

*"Assignment of FTRs*

**"13.248 Assignment of FTRs**

- "(1) If a person ("assignor") wishes to assign an **FTR** to another person ("assignee"), the assignor and assignee of the **FTR** must complete and sign Form 1 in Schedule 13.6 and provide it to the **FTR manager**.
- "(2) The form may be transmitted in electronic form through the **information system** if—
- "(a) both the assignor and assignee consent to completing and signing the form electronically; and
  - "(b) the electronic form contains all of the information required by Form 1 in Schedule 13.6; and
  - "(c) the notification of assignment to the **FTR manager** is in a format specified by the **FTR manager**.
- "(3) The **FTR manager** must not register an assignment in the **FTR register** unless the **FTR manager** is satisfied that the assignee meets the prudential security requirements in Part 14.
- "(4) The **FTR manager**, on being satisfied that all requirements for an assignment are met, must register the assignment on the **FTR register**.
- "(5) An assignment of an **FTR** is not effective unless it is registered on the **FTR register** by the **FTR manager**.

- "(6) The **FTR manager** must not register an assignment that is expressed to have effect after the end of the **billing period** to which the **FTR** relates.

**"13.249 Liability for FTR payments when FTR assigned and price disclosed**

- "(1) This clause applies if—
- "(a) an **FTR** is assigned under clause 13.248; and
  - "(b) the notification of assignment discloses the price at which the **FTR** has been assigned.
- "(2) The **FTR manager** must provide a copy of the notification of assignment to the **clearing manager**.
- "(3) The assignee becomes liable for the price disclosed under subclause (1)(b) when it becomes due on settlement of the **FTR**.
- "(4) If the price disclosed in the notification is less than the **FTR payment** in respect of the **FTR** that would, if the assignment had not taken place, become due on settlement of the **FTR**, the assignor becomes liable to pay the **clearing manager** an amount equal to the difference between the **FTR payment** and the price at which the **FTR** has been assigned.
- "(5) The **clearing manager** must include the amount payable under subclause (4) in the invoice for the **billing period** in which the assignment took place.
- "(6) The **clearing manager** must transfer to the **FTR account** any amount received pursuant to an invoice issued under this clause, but that amount must not be applied for the settlement of **FTRs** until the **billing period** in which the **FTR** to which the payment relates is due to be settled.
- "(7) If the price disclosed in the notification is more than the **FTR payment** in respect of the **FTR** that would, if the assignment had not taken place, become due on settlement of the **FTR**, the assignor becomes entitled to be paid by the **clearing manager** on settlement of the **FTR** an amount equal to the difference between the **FTR payment** and the price at which the **FTR** has been assigned.

**"13.250 Liability for FTR payments when FTR assigned and price not disclosed**

- "(1) This clause applies if—
- "(a) an **FTR** is assigned under clause 13.248; and
  - "(b) the notification of assignment does not disclose the price at which the **FTR** has been assigned.
- "(2) The **FTR manager** must provide a copy of the notification of assignment to the **clearing manager**.

- "(3) The assignee becomes liable to pay the **FTR payment** in respect of the **FTR** that has been assigned when it becomes due on settlement of the **FTR**.

*"Provision of information to the FTR manager and clearing manager"*

**"13.251 Information to be provided to FTR manager"**

- "(1) Each **grid owner** must provide a forecast of the configuration and capacity of the **grid owner's grid** for the **FTR period** (as advised to each **grid owner** by the **FTR manager**) to the **FTR manager** for use in determining the **FTRs** to be offered in each **FTR auction**.
- "(2) The information that each **grid owner** must provide must include relevant planned outages.
- "(3) Except as otherwise agreed with the **FTR manager**, each **grid owner** must provide the information to the **FTR manager** no later than 1 month before the date (as advised to each **grid owner** by the **FTR manager**) on which an **FTR auction** is to be held.
- "(4) The **clearing manager** must advise the **FTR manager**—
- "(a) whether a person who has applied to participate in an **FTR auction** meets the prudential security requirements in Part 14; and
- "(b) the amount of security that a person who has applied to participate in an **FTR auction** has provided that exceeds that person's other obligations under Part 14.
- "(5) Except as otherwise agreed with the **FTR manager**, the **clearing manager** must provide the information to the **FTR manager** no later than 2 **business days** before the date (as advised to the **clearing manager** by the **FTR manager**) on which an **FTR auction** is to be held.
- "(6) If the information referred to in subclause (4) changes, the **clearing manager** must, if requested by the person who has applied to participate in an **FTR auction**, provide the updated information to the **FTR manager**.
- "(7) The **clearing manager** must inform the **FTR manager**, as soon as practicable after receiving a request from the **FTR manager**, whether an assignee of an **FTR** meets the prudential security requirements in Part 14.

**"13.252 Information to be provided to clearing manager"**

- "(1) The **FTR manager** must provide the following information to the **clearing manager** in relation to each successful bidder in an **FTR auction**:
- "(a) the details of each **FTR** allocated under an **FTR auction**, including—



- "(i) the period to which the **FTR** applies; and
  - "(ii) whether the **FTR** is an **option FTR** or an **obligation FTR**; and
  - "(iii) the formula under which the amount payable or to be paid is to be calculated for the settlement of the **FTR**;
  - "(b) the price at which each **FTR** has been allocated.
- "(2) The **FTR manager** must provide the information specified in subclause (1) to the **clearing manager** as soon as practicable and no later than 1 week after each **FTR auction**.

**"13.253 Transmission of information to FTR manager and clearing manager**

The information required to be provided to the **FTR manager** and the **clearing manager** under clauses 13.251 and 13.252 must be transmitted through the **information system**, except as otherwise agreed by the parties providing and receiving the information.

**"13.254 Publication of results of FTR auctions**

The **FTR manager** must, as soon as practicable after each **FTR auction**, make the results of each **FTR auction** available to the public at no cost on the **FTR manager's** website in accordance with the **FTR allocation plan**.

*"Suspension of FTR allocation*

**"13.255 Authority may direct FTR manager to suspend allocation of FTRs**

The **Authority** may direct the **FTR manager** to suspend the allocation of **FTRs** if there is any contingency or event that—

- "(a) threatens, or may threaten, the allocation or settlement of **FTRs** and that would, or would be likely to, preclude the maintenance of orderly allocation or trading of **FTRs** or proper settlement of **FTRs**; and
- "(b) that, in the reasonable opinion of the **Authority**, cannot satisfactorily be resolved by any other mechanism available under this Code."

**9 New Schedules 13.5 and 13.6 inserted**

Schedule 13.5 and Schedule 13.6, which are set out in Schedule 1 of this Amendment, are inserted after Schedule 13.4.

**10 Payers must satisfy prudential requirements**

Clause 14.3 is amended by inserting the following subclause:

"(2) Before a **payer** may purchase an **FTR**, and at all times while it has any obligations in relation to an **FTR**, the **payer** must meet the prudential requirements as set out in subclause (1)."

**11 Acceptable forms of security**

Clause 14.5 is amended by omitting "14.3(b)" and substituting "14.3(1)(b)".

**12 Acceptable credit rating and security**

- (1) Clause 14.6(1) is amended by omitting "14.3(a)" and substituting "14.3(1)(a)".
- (2) Clause 14.6(3) is amended by omitting "14.3(b)" and substituting "14.3(1)(b)".

**13 Cash deposit accounts to be established by clearing manager**

Clause 14.7(2)(c) is amended by inserting ", the **FTR account**," after "the **operating account**".

**14 Cash deposits to be applied subject to conditions**

- (1) Clause 14.9(a) is amended by inserting "that have not been transferred in accordance with paragraph (aa)" after "under this Code".
- (2) Clause 14.9 is amended by inserting the following paragraph after paragraph (a):

"(aa) following any **event of default**, the **clearing manager** must transfer to the **FTR account** such amount on account of the defaulter's **cash deposit** as is necessary or available in order to satisfy (to the extent possible) any amounts that may be due and owing by the defaulter to the **clearing manager** in respect of **FTRs** under this Code in accordance with clause 14.62A:".

**15 Determination of security level**

Clause 14.19 is amended by—

- (a) inserting the following paragraph after paragraph (d):

"(da) the **clearing manager's** estimate of an amount to be required by that **payer** in respect of any **FTR** in respect of which the

payer is named in the **FTR register**, calculated in accordance with the methodology approved by the **Authority** under clause 14.19B—"; and

- (b) inserting the following paragraph before paragraph (e):

"(db) the amount of any **FTR payment** due in respect of an **FTR**:".

**16 New clauses 14.19A, 14.19B and 14.19C inserted**

The following clauses are inserted after clause 14.19:

**"14.19A Methodology for determining minimum level of security required in respect of FTRs**

- "(1) The **clearing manager** must formulate and **publish** a methodology for determining the minimum level of security required from a **payer** in relation to a matter set out in clause 14.19(da).
- "(2) The methodology formulated by the **clearing manager** under subclause (1) must comply with the principle that the amount taken into account under clause 14.19(da) is an estimate of the value (being an amount that may be positive or negative) of the **FTR** at the time that the estimate is made and the potential for that value to change prior to settlement.

**"14.19B Approval of methodology for determining minimum level of security required in respect of FTRs**

- "(1) The **clearing manager** must submit to the **Authority** for approval a draft methodology for determining the minimum level of security required from a **payer** in relation to a matter set out in clause 14.19(da).
- "(2) In preparing the draft methodology, the **clearing manager** must—
  - "(a) consult with persons that the **clearing manager** thinks are representative of the interests of persons likely to be substantially affected by the methodology; and
  - "(b) consider submissions made on the methodology.
- "(3) The **clearing manager** must provide a copy of each submission received under subclause (2) to the **Authority**.

- "(4) The **Authority** must, as soon as practicable after receiving the draft methodology, by notice in writing to the **clearing manager**—
  - "(a) approve the methodology; or
  - "(b) decline to approve the methodology.
- "(5) If the **Authority** declines to approve the draft methodology, the **Authority** must **publish** the changes that the **Authority** wishes the **clearing manager** to make to the draft methodology.
- "(6) When the **Authority publishes** the changes that the **Authority** wishes the **clearing manager** to make to the draft methodology under subclause (5), the **Authority** must **notify** the **clearing manager** and interested parties of the date by which submissions on the changes must be received by the **Authority**.
- "(7) Each submission on the changes to the draft methodology must be made in writing to the **Authority** and be received on or before the date specified by the **Authority** under subclause (6).
- "(8) The **Authority** must—
  - "(a) provide a copy of each submission received to the **clearing manager**; and
  - "(b) **publish** the submissions.
- "(9) The **clearing manager** may make its own submission on the changes to the draft methodology and the submissions received in relation to the changes. The **Authority** must **publish** the **clearing manager's** submission when it is received.
- "(10) The **Authority** must consider the submissions made to it on the changes to the draft methodology.
- "(11) Following the consultation required by subclauses (6) to (10), the **Authority** may approve the methodology subject to the changes that the **Authority** considers appropriate being made by the **clearing manager**.

**"14.19C Variations to methodology for determining minimum level of security required in respect of FTRs**

- "(1) A **participant** or the **Authority** may submit a proposal for a variation to the methodology formulated under clause 14.19A.
- "(2) The **clearing manager** must provide a copy of each proposed variation received from a **participant** under subclause (1) to the **Authority**.
- "(3) The **clearing manager** must consider a proposed variation to the methodology submitted under subclause (1).

- "(4) The **clearing manager** may submit a request for a variation to the methodology to the **Authority**.
- "(5) The consultation and approval requirements under clause 14.19B apply to a request for a variation submitted under subclause (4) as if references to the draft methodology were a reference to the requested variation.
- "(6) If the **clearing manager** does not submit a request for a variation submitted under subclause (1) to the **Authority** under subclause (4), the **Authority** may consider the proposal and require the **clearing manager** to submit a request for a variation based on the proposal to the **Authority**, and subclause (5) applies accordingly.
- "(7) The **Authority** may approve a variation requested under subclause (4) or subclause (6) without complying with the provisions referred to in subclause (5) if—
  - "(a) the **Authority** considers that it is necessary or desirable in the public interest that the requested variation be made urgently; and
  - "(b) the **Authority publishes** a notice of the variation and a statement of the reasons why the urgent variation is needed.
- "(8) Every variation made under subclause (7) expires on the date that is 9 months after the date on which the variation is made."

**17 Hedge settlement agreements, under-frequency events or other liability**

Clause 14.21 is amended by inserting "or under an **FTR**," after "a **hedge settlement agreement**,".

**18 Issue of invoices**

Clause 14.36 is amended by inserting the following subclause:

- "(3) At the same time as the **clearing manager** issues invoices under subclause (1) or, if **publication of final prices** is delayed under clause 13.184 for any **trading period** in the **billing period**, **2 business days** after the relevant **final prices** are **published**, the **clearing manager** must issue an invoice in respect of the settlement of any amount owing under an **FTR** and any **FTR payment** due in respect of an **FTR**."

**19 Payment of invoices**

Clause 14.37 is amended by revoking subclause (2) and substituting the following subclauses:

- "(2) The allocation by the **clearing manager** of a payment received from a **payer** in respect of an invoice must be dealt with in accordance with subclause (3), and clauses 14.47 and 14.47A. A **payer** may not direct the **clearing manager** to apply any funds paid in respect of an invoice other than in accordance with clauses 14.47 and 14.47A.
- "(3) The **clearing manager** must transfer to the **FTR account**—
  - "(a) any amount received under subclause (1) in respect of the settlement of any amount owing under an **FTR**; and
  - "(b) any amount to pay under clause 14.45(ga) in respect of the settlement of any amount owing under an **FTR**; and
  - "(c) any **FTR payment** due in respect of an **FTR**."

**20 Content of invoice**

Clause 14.40 is amended by inserting the following paragraph after paragraph (f):

- "(fa) the net amount to pay, or to be paid, for that **billing period** in respect of—
  - (i) the settlement of every **FTR** in respect of which the **payer** is registered as the holder of the **FTR**; and
  - (ii) every **FTR payment** that has become due:".

**21 New clause 14.43A inserted**

The following clause is inserted after clause 14.43:

**"14.43A Clearing manager must establish FTR account**

- "(1) The **clearing manager** must establish, in its name, an **FTR account** with a **bank**.
- "(2) The **FTR account** must—
  - "(a) be held by the **clearing manager** as a trust account for the benefit of the persons who are entitled to any payment from the **FTR account**; and
  - "(b) be clearly identified as such; and
  - "(c) subject to this Code, be entirely separate from

the **cash deposit accounts** and any other account of the **clearing manager**.

"(3) Subject to this Code, the **clearing manager** may only make payments from the **FTR account** in accordance with clause 14.48A.

"(4) The **clearing manager** must obtain an acknowledgement from the **bank** with which the **FTR account** is held that—

"(a) the funds in that account are held on trust for the purposes set out in clause 14.47A; and

"(b) the **bank** has no right of set-off or combination in relation to the funds."

**22 Issue of invoices to payees**

Clause 14.44(a) is amended by inserting "and clause 14.47A" after "clause 14.47".

**23 Content of pro forma invoice**

Clause 14.45 is amended by inserting the following paragraph after paragraph (g):

"(ga) the net amount to pay, or to be paid, for that **billing period** in respect of—

"(i) the settlement of every **FTR** in respect of which the **payee** is registered as the holder; and

"(ii) every **FTR payment** that has become due:".

**24 Clearing manager to make payments**

Clause 14.46(4) is amended by inserting ", 14.47A," after "14.47".

**25 Clearing manager to prioritise payment of funds**

Clause 14.47 is amended by inserting "(excluding any amount in respect of an **FTR** or an **FTR payment**)" after "rendered under clauses 14.36 or 14.44".

**26 New clause 14.47A inserted**

The following clause is inserted after clause 14.47:

**"14.47A Payments in respect of FTRs**

- "(1) The **clearing manager** must calculate the total amount payable by the **clearing manager** in respect of **FTRs** in respect of the current **billing period**.
- "(2) The **clearing manager** must **publish** the amount payable by a person or to a person per **MW** in respect of **FTRs** in respect of the current **billing period**.
- "(3) The **clearing manager** must pay any amount payable in respect of **FTRs** in respect of the current **billing period** from the **FTR account**, in accordance with the terms of the **FTR**.
- "(4) If the total amount required to be paid by the **clearing manager** in respect of **FTRs** in respect of the **billing period** exceeds the amount of all funds in the **FTR account** available for the settlement of **FTRs** in the relevant **billing period**, the **clearing manager** must amend each amount payable to a person in respect of each **FTR** for that **billing period** so that the amount payable is calculated according to the following formula:

$$A = B \times (C/D)$$

"where

"A is the amount payable under each **FTR**

"B is the amount owing under the **FTR** minus the amount of the **FTR payment** owing under the **FTR**

"C is the total amount available to make payments under subclause (3)

"D is the total amount required to settle **FTRs** in respect of the **billing period**

- "(5) Subclause (4) does not apply to an **FTR** in respect of which the holder of the **FTR** is required to pay an amount to the **clearing manager**."

**27 New clauses 14.48A and 14.48B inserted**

The following clauses are inserted after clause 14.48:

**"14.48A Payment from FTR account**

- "(1) Subject to clause 14.46, each payment required to be made by the **clearing manager** from the **FTR**



**account** to the person entitled to the payment must be made by direct payment to the **bank** account that the person entitled to the payment may advise the **clearing manager** in writing from time to time.

- "(2) Except as expressly permitted by this Code or as required by law, all payments from the **FTR account** must be free and clear of any withholding or deduction and without any set-off or counter claim.

**"14.48B Allocation of funds to FTR account**

- "(1) This clause applies if—

"(a) a **payer** pays an amount in respect of an invoice that is less than the amount of the invoice; and

"(b) the amount of the invoice includes an amount payable in respect of an **FTR**.

- "(2) The **clearing manager** must apportion the amount to be transferred to the **FTR account** and the amount in respect of other amounts invoiced according to the proportion that each amount bears to the total amount invoiced."

**28 Inadequate funds reduces amounts paid to generators**

Clause 14.49 is amended by inserting "(excluding any amount in respect of an **FTR** or an **FTR payment**)" after "invoiced by the **clearing manager**".

**29 Further funds paid according to priority**

Clause 14.51 is amended by inserting "(excluding any amount in respect of an **FTR** or an **FTR payment**)" after "received by the **clearing manager**".

**30 New clause 14.51A inserted**

The following clause is inserted after clause 14.51:

**"14.51A Late payments in respect of FTRs**

- "(1) As further funds constituting late payments (including any interest payable under clause 14.50(2)) in respect of any **billing period** are received by the **clearing manager** in respect of **FTRs** or **FTR payments**, the **clearing manager** must pay those funds into the **FTR account**.

- "(2) The **clearing manager** must apply late payments received under subclause (1) in satisfaction or part satisfaction of amounts payable (including interest calculated on the same basis as set out in clause 14.50(2) if interest is paid under that subclause) by

the **clearing manager** under clause 14.47A in respect of the **billing period** in which the late payments were owed."

**31 Generators assigned or subrogated to all clearing manager's rights of recovery**

Clause 14.54 is amended by inserting "so that any amount paid to **generators** is reduced under clause 14.49" after "would otherwise be payable to them".

**32 Event of default gives clearing manager certain remedies**

Clause 14.58 is amended by—

- (a) inserting ", 14.9(aa)," after "clauses 14.9(a)"; and
- (b) inserting the following paragraph after paragraph (d):

"(e) take possession of any **FTRs** held by the defaulting **payer** in accordance with subclauses (2) and (3)."; and

- (c) inserting the following subclauses:

"(2) The **clearing manager** on application to the **FTR manager** is entitled to be registered on the **FTR register** as the holder of any **FTR** that the **clearing manager** takes possession of under subclause (1)(e) without any further authorisation than this subclause.

"(3) If the value of the **FTRs** held by the defaulting **payer** exceeds the amount required to remedy the **event of default**, the **clearing manager** may exercise its discretion in deciding which **FTRs** are transferred to the **clearing manager**.

"(4) If the amount received by the **clearing manager** on settlement or sale of an **FTR** taken possession of under subclause (1)(e) exceeds the amount required to remedy the **event of default**, the **clearing manager** must repay the excess amount to the defaulting **payer**.

"(5) If the **clearing manager** holds an **FTR** in respect of which an amount would be payable if the **FTR** was held by another person, no amount is payable by the **clearing manager**."

- 33 **Pro rata call on security**  
Clause 14.59 is amended by omitting "14.58(a)" and substituting "14.58(1)(a)".
- 34 **Clearing manager to specify pro rata proportion**  
(1) Clause 14.60 is amended by omitting "14.58(a)" in each place where it appears and substituting in each case "14.58(1)(a)".  
(2) Clause 14.60 is amended by omitting "14.58(b)" in each place where it appears and substituting in each case "14.58(1)(b)".
- 35 **If security to be pro rated**  
Clause 14.62 is amended by omitting "14.58(a)" and substituting "14.58(1)(a)".
- 36 **New clause 14.62A inserted**  
The following clause is inserted after clause 14.62:

**"14.62A Allocation of amounts to FTR obligations and other obligations**

- "(1) If the **clearing manager** exercises any of the remedies under clause 14.58(1)(a) or (b) against a **payer**, the **clearing manager** must transfer to the **FTR account** any amounts recovered to satisfy amounts that may be due and owing by the defaulting **payer** in respect of **FTRs** in accordance with the following formula:

$$C_{FTR} = C_{TOT} \times (O_{FTR}/O_{TOT})$$

"where

" $C_{FTR}$  is the amount that must be transferred to the **FTR account**

" $C_{TOT}$  is the total amount recovered under clause 14.58(1)(a) and (b)

" $O_{FTR}$  is the amount owing in respect of **FTRs** held by the defaulting **payer**

" $O_{TOT}$  is the total amount owing by the defaulting **payer** under this Code"

- "(2) The **clearing manager** must apply any amounts recovered under subclause (1) that have not been transferred in accordance with subclause (1) to satisfy any amounts that may be due and owing by

the defaulting **payer** to the **clearing manager** under this Code."

**37 Rights of generators to exercise rights**

Clause 14.63(1)(b) is amended by inserting "(other than an amount in respect of the settlement of an **FTR** or an **FTR payment**)" after "collect all amounts".

**38 Payment of loss and constraint excess**

- (1) Clause 14.73(1) is amended by inserting "and **residual loss and constraint excess**" after "the appropriate **loss and constraint excess**".
- (2) Clause 14.73(1) is amended by inserting "and subclause (4)" after "in accordance with subclause (3)".
- (3) Clause 14.73 is amended by inserting the following subclauses after subclause (2):

"(2A) The **FTR manager** must—

- "(a) determine the amount of **loss and constraint excess** that must be retained by the **clearing manager** and paid into the **FTR account** in accordance with Schedule 14.6; and
- "(b) advise the **clearing manager** of that amount no later than 1600 hours on the 7<sup>th</sup> **business day** of the month following the relevant **billing period**.

"(2B) The **system operator** and **pricing manager** must provide information to the **FTR manager** in accordance with Schedule 14.6.

"(2C) The **clearing manager** must retain the amount advised under subclause (2A) and pay the amount into the **FTR account**.

"(2D) If the amount that the **FTR manager** advises the **clearing manager** under subclause (2A) exceeds the amount of the **loss and constraint excess** for the **billing period**, the **clearing manager** must retain all of the **loss and constraint excess** and pay all of the **loss and constraint excess** into the **FTR account**."

- (4) Clause 14.73 is amended by revoking subclause (3) and substituting the following subclauses:

"(3) The **Authority** must advise the **clearing manager** of the proportion of the **loss and constraint excess** and **residual loss and constraint excess** each **grid owner** is to be paid.

"(4) Unless the **Authority** has directed otherwise under this clause, the **clearing manager** must pay to each

**grid owner** in the proportions advised under subclause (3)—

"(a) the amount of any **loss and constraint excess** less the amount retained under subclause (2C); and

"(b) the amount of any **residual loss and constraint excess**.

"(5) Each **grid owner** must treat **residual loss and constraint excess** paid to it under subclause (4) as **loss and constraint excess**."

**39 New schedule 14.6 inserted**

Schedule 14.6, which is set out in Schedule 2 of this Amendment, is inserted after Schedule 14.5.

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**Explanatory Note**

*This note is not part of the Code Amendment, but is intended to indicate its general effect.*

This amendment to the Electricity Industry Participation Code 2010 comes into force on 1 October 2011. This amendment provides for the introduction of financial transmission rights.

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Date of notification in the *Gazette*: 11 August 2011.

**Schedule 1**  
**New Schedules 13.5 and 13.6 inserted**

cl 9

**"Schedule 13.5**  
**"Requirements for FTR allocation plan**

cl 13.238

**"1 Purpose**

The purpose of this Schedule is to set out the requirements for the **FTR allocation plan** prepared by the **FTR manager** under subpart 6 of Part 13.

**"2 Requirements for design of FTRs**

"(1) **FTRs** must be allocated by auction.

"(2) At a minimum, the **FTRs** allocated under the **FTR allocation plan** must be **FTRs** between a **hub** in the South Island and a **hub** in the North Island that would provide a reasonable match with the trading points for exchange-traded futures products or the equivalent **electricity** futures products, and which would enable the volumes of **FTRs** available to reflect inter-island **grid** capacity.

"(3) The **FTR manager** must offer **option FTRs** and **obligation FTRs**.

"(4) The **FTRs** offered must include **FTRs** for which the **FTR period** is 1 month.

"(5) Subclause (4) does not prevent the **FTR manager** from offering **FTRs** relating to a shorter **FTR period** in addition to **FTRs** for which the **FTR period** is 1 month.

**"3 Requirements for FTR auction design**

"(1) The number and nature of the **FTRs** allocated under the **FTR allocation plan** and available for auction must be—

"(a) supported by a reasonable estimate of the capacity of the **grid** for the relevant period; and

"(b) set so as to achieve a reasonable balance between the following:

"(i) ensuring that there is revenue available that is sufficient to settle the **FTRs**;

"(ii) ensuring that sufficient **FTRs** are available so that **participants** who wish to purchase **FTRs** are able to obtain them.

"(2) The **FTR auction** must be designed to—

"(a) maximise the value of trade in the auction as determined by the bids made in the auction; and

"(b) maximise competition in the auction; and

"(c) minimise costs of participation in the auction.

"(3) The **FTR allocation plan** must include **FTR auction** rules.

"(4) The initial **FTR allocation plan** must specify a plan that seeks to—

- "(a) ensure that, no later than 1 year after the first **FTR auction**, **FTRs** are available in each **FTR auction** relating to an initial month and to at least each of the 11 months following the initial month; and
- "(b) ensure that the availability of **FTRs** is progressively increased so that, no later than 3 years after the first **FTR auction**, **FTRs** are available in each **FTR auction** relating to an initial month and to at least the 23 months following the initial month.

**"4 Requirements for FTR grid design**

The **FTR grid** must—

- "(a) be based on each **grid owner's** forecast of the configuration and capacity of its **grid** for the **FTR period**; and
- "(b) make allowance for relevant planned and unplanned outages in accordance with reasonable transmission operating practice.

## "Schedule 13.6

cl 13.248

### "Form 1 "Assignment of FTR

"Date: \_\_\_\_\_

"FTR registered  
number: \_\_\_\_\_

"Price\*: \_\_\_\_\_

"Assignor: \_\_\_\_\_

"Assignee: \_\_\_\_\_

\*\* Parties are only required to specify the price if they wish clause  
13.249 to apply."



**Schedule 2**  
**New Schedule 14.6 inserted**

cl 39

cl 14.73(2A)

**"Schedule 14.6**  
**"Calculation of amount of loss and constraint**  
**excess to be paid into FTR account**

**"1 Purpose**

The purpose of this Schedule is to set out the formulae and process for the calculation under clause 14.73(2A) of the amount of the **loss and constraint excess** to be paid into the **FTR account**.

**"2 Interpretation**

**"(1)** In this Schedule, unless the context otherwise requires,—

**AC line** means any **AC branch**

**balanced**, in relation to an **FTR injection pattern**, means that the total positive and negative **hub injections** sum to 0. A **balanced FTR injection pattern** is consistent with a grid in which **losses** are not modelled

**binding**, in relation to a **constraint**, means that the **constraint** has a non-zero **shadow price**

**branch constraint** means a **constraint** in which all the **LHS** variables are branch flows

**canonical form** means a linear programming problem that is expressed in the following form:

$$\begin{array}{ll} \text{maximise} & c^T x \\ \text{subject to} & Ax \leq b \end{array}$$

where

$x$  is the vector of variables to be determined

$c$  and  $b$  are vectors of constants

$A$  is a matrix of coefficients

$c^T x$  is the objective function to be maximised

$Ax \leq b$  is the set of **constraints**, each row of  $Ax$  being the **LHS** of a **constraint** and each element of  $b$  being the corresponding **RHS**

Minimum **constraints** are assumed to have been multiplied through by -1 to form an equivalent maximum **constraint**

Equality **constraints** are assumed to have initially been represented by a pair of minimum and maximum **constraints** with the same **LHS** and **RHS**, and then the resulting minimum **constraint** is assumed to have been multiplied through by -1 to form an equivalent maximum **constraint**

**closed**, in relation to a **branch**, means that the **branch** is connected at both ends

**feasible region**, in relation to an n-dimensional linear programming problem, means the n-dimensional solution space filled by the set of all possible feasible solutions

**final pricing schedule** means the schedule that the **pricing manager** uses to produce the **interim prices** on which **final prices** are based

**FTR injection pattern** means the combination of positive or negative net **hub injections** implied by a combination of **FTRs**

**hub injection** means the actual or notional flow of **electricity** into the **grid**, if positive, or out of the **grid**, if negative, at any **hub**

**HVDC link** has the same meaning as in the **model formulation**

**LHS** means the left hand side of a **constraint** expressed in **canonical form**

**mixed constraint** has the same meaning as in the **model formulation**

**open**, in relation to a **branch**, means that the **branch** is disconnected at 1 or both ends

**operational system split** means an instance where the **system operator** chooses to operate with a switch or **branch open** for reasons such as—

- (a) breaking loops that would otherwise constrain flows;  
or
- (b) reducing the size of the maximum fault duty that switchgear needs to withstand

**RHS** means the right hand side of a **constraint** when expressed in **canonical form**

**scheduled**, in relation to a variable, means the value of the variable in the **final pricing schedule**

**shadow price**, in relation to an **AC line capacity**, **branch constraint** or **mixed constraint**, means the absolute value of the shadow price in \$/MWh for the **AC line** or **constraint** reported in the **final pricing schedule**

**simultaneously feasible**, in relation to an **FTR injection pattern**, means that the implied flows can be carried by the transmission system, subject to the **constraints** as defined by clause 5(8)

**unbalanced**, in relation to an **FTR injection pattern**, means that total positive **hub injections** exceed total negative **hub injections** by the amount of total **losses**. An **unbalanced FTR injection pattern** is consistent with a **grid** in which **losses** are modelled

"(2) For the purposes of this Schedule, **constraints** that are not expressed in **canonical form** in the **model formulation** must be translated into the equivalent **canonical form**.

"3 **Amount of loss and constraint excess to be paid into FTR account**

The amount of the **loss and constraint excess** that must be paid into the **FTR account** under clause 14.73(2C) is the amount calculated under clause 9(6)(b).

"4 **System operator must determine normal grid configuration**

"(1) The **system operator** must determine a normal **grid** configuration.

"(2) The normal **grid** configuration determined under subclause (1) must be a **grid** configuration with all existing **branches** and switches **closed** except where the **system operator** or **grid owner** has implemented **operational system splits** and the **system operator** or **grid owner** considers that the normal state of those **operational system splits** is for the relevant **branch** or switch to be **open**.

"(3) The **system operator** must provide to the **FTR manager** the model data describing the normal **grid** configuration determined under subclause (1).

"(4) The **system operator** must determine a new normal **grid** configuration if the **system operator** considers it necessary because, for example, any of the following occur:

"(a) some **grid** equipment is commissioned or decommissioned:

"(b) there is a change in the capacity or impedance of some **grid** equipment:

"(c) the **system operator** considers that the normal state of any **operational system split** has changed.

- "(5) The **system operator** must provide new model data to the **FTR manager** if the **system operator** determines a new normal **grid** configuration under subclause (4), unless otherwise agreed with the **FTR manager**.
  
- "5 **FTR manager must determine FTR injection patterns**
- "(1) The **FTR manager** must determine a set of **unbalanced extreme FTR injection patterns**.
- "(2) Each **unbalanced extreme FTR injection pattern** determined under subclause (1) must be **simultaneously feasible** assuming—
  - (a) the normal **grid** configuration determined under clause 4; and
  - (b) the absence of all other **grid** flows; and
  - (c) all **AC line** and **HVDC link** capacity limits applied; and
  - (d) all risk and reserve **constraints** disabled; and
  - (e) all **branch** variable **losses** modelled; and
  - (f) all **branch** fixed **losses** set to 0.
- "(3) The set of **unbalanced extreme FTR injection patterns** determined under subclause (1) must, in the reasonable opinion of the **FTR manager**, be the set of **FTR injection patterns** that best represents the extreme limits of the **feasible region of FTR injection patterns** as defined by the assumptions listed under subclause (2).
- "(4) The **FTR manager** must determine a set of **balanced extreme FTR injection patterns** that approximates the set of **unbalanced extreme FTR injection patterns** determined under subclause (1).
- "(5) For each **balanced extreme FTR injection pattern** determined under subclause (4), the implied flow on each **AC branch** under the following assumptions must be greater than or equal to the flow on that **branch** implied by the corresponding **unbalanced extreme FTR injection pattern** determined under subclause (1):
  - "(a) the normal **grid** configuration determined under clause 4;
  - "(b) the absence of all other **grid** flows;
  - "(c) all **branch** capacity limits disabled;
  - "(d) all **branch constraints** disabled;
  - "(e) all **mixed constraints** disabled;
  - "(f) all risk and reserve **constraints** disabled;
  - "(g) all **branch** variable and fixed **losses** set to 0.
- "(6) The **FTR manager** must determine a new set of **unbalanced extreme FTR injection patterns** and a new set of **balanced extreme FTR injection patterns** if—
  - "(a) the **system operator** provides the **FTR manager** with new model data under clause 4(5) that results in a change to the **feasible region of FTR injection patterns**; or

"(b) there is a change to the **hubs** or set of **hubs** specified in the **FTR allocation plan**.

**"6 FTR manager must determine matrix of lossless shift factors**

"(1) For each **trading period** of the relevant **billing period**, following the **publication** of **final prices**, the **FTR manager** must determine a matrix of lossless shift factors referenced to a set of reference **nodes**, from the **input information** or revised data used to produce the **final pricing schedule**, in accordance with the following:

"(a) one reference **node** must be chosen within each electrical island:

"(b) **nodes** are in the same electrical island if a transmission path exists between them.

"(2) The matrix of lossless shift factors determined under subclause (1) must be calculated in accordance with the following matrix formula:

$$[\text{ShiftFactor}] = [\text{AdmittancePrimitive}] \times [\text{Inc}] \times [\text{Impedance}]$$

where

$[\text{ShiftFactor}]$  is the  $m$  by  $n$  matrix of lossless shift factors, which defines the increment in flow in the conventional forward flow direction on any **branch** in the transmission **network** resulting from an increment in net **injection** at any **node** together with an equal decrement in net **injection** at the reference **node** in the electrical island in which the **node** resides, while neglecting the effect of **losses**

$[\text{AdmittancePrimitive}]$  is the  $m$  by  $m$  diagonal matrix formed from the set of  $m$  **branch** susceptances

$[\text{Inc}]$  is the  $m$  by  $n$  lossless **branch-node** incidence matrix, which denotes the conventional from and to **nodes** for a **branch** by matrix entries of 1 and -1 respectively

$[\text{Impedance}]$  is the  $n$  by  $n$  matrix formed from the inverse of  $[\text{AdmittanceNodal}]$  with the columns and rows associated

with the reference **nodes** reinserted and filled with zeroes

[AdmittanceNodal] is the  $n-r$  by  $n-r$  matrix obtained from [AdmittanceNodalComplete] by deleting the column and row associated with each of the reference **nodes**

[AdmittanceNodalComplete] is the  $n$  by  $n$  matrix =  $[\text{Inc}^T] \times [\text{AdmittancePrimitive}] \times [\text{Inc}]$

$[\text{Inc}^T]$  is the  $n$  by  $m$  matrix transpose of [Inc]

"(3) For the purposes of subclauses (1) and (2) —

- "(a) the set of inter-**island HVDC links** must be replaced by a single **AC line** with a nominal susceptance value between the Benmore and Haywards HVDC terminal **nodes**, whether or not any **HVDC link** is actually in service during the relevant **trading period**; and
- "(b) the nominal susceptance value determined under paragraph (a) may be any suitable value that will avoid numerical difficulties; and
- "(c) any switches between the Benmore HVDC terminal **node** and other Benmore **nodes** operating at the same nominal voltage that are normally **closed** must be treated as **closed**; and
- "(d) any switches between the Haywards HVDC terminal **node** and other Haywards **nodes** operating at the same nominal voltage that are normally **closed** must be treated as **closed**; and
- "(e) in any **trading period** in which any of the **hubs** reside in different electrical islands (as defined in subclause (1)(b)), the shift factor matrix for the previous **trading period** in which all the **hubs** resided in the same electrical island must be used.

**"7 FTR manager must determine branch participation loading and constraint participation loading**

- "(1) For each **trading period** of the relevant **billing period**, the **FTR manager** must determine a **branch** participation loading for each **AC line**  $k$ .
- "(2) Each **branch** participation loading determined under subclause (1) must be calculated—
  - "(a) in accordance with the following formula if the **scheduled** flow on the **AC line** is in the conventional forward flow direction:

$$\max \left( \sum_{h \in Hubs} SF_{k,h} \times Inj_{h,p} : p \in 1, \dots, P \right); \text{ and}$$

"(b) in accordance with the following formula if the **scheduled** flow on the **AC line** is in the conventional reverse flow direction:

$$- \min \left( \sum_{h \in Hubs} SF_{k,h} \times Inj_{h,p} : p \in 1, \dots, P \right)$$

where

$SF_{k,h}$  is the shift factor relating flows on **AC line**  $k$  to **injections** at **hub**  $h$ , determined under clause 6(1)

$Inj_{h,p}$  is the positive or negative **hub injection** at **hub**  $h$  in **FTR injection pattern**  $p$  in the set of  $P$  **balanced extreme FTR injection patterns** determined under clause 5(4)

"(3) For each **trading period** of the relevant **billing period**, for each **binding branch constraint**  $v$  involving **AC line** flows, the **FTR manager** must determine a **constraint** participation loading in accordance with the following formula:

$$\max \left( \sum_{k \in ACLineGroup_v} \sum_{h \in Hubs} weight_{k,v} \times SF_{k,h} \times Inj_{h,p} : p \in 1, \dots, P \right)$$

where

$SF_{k,h}$  and  $Inj_{h,p}$  are as defined in subclause (2)

$ACLineGroup_v$  is the set of **AC lines** involved in **branch constraint**  $v$  (any **HVDC link** flow terms in the **constraint** must be excluded from this calculation)

$weight_{k,v}$  is the weight associated with **AC Line**  $k$  in **branch constraint**  $v$  expressed in **canonical form**

"(4) For each **trading period** of the relevant **billing period**, for each **binding mixed constraint**  $v$  (if any) involving **AC line** flow terms or **AC line** variable loss terms, the **FTR manager** must determine a **constraint** participation loading in accordance with the following formula:

$$\max \left( \sum_{k \in ACLineGroup_v} (flowweight_{k,v} \times flow_{k,p} + lossweight_{k,v} \times loss_{k,p}) : p \in 1, \dots, P \right)$$

where

$ACLineGroup_v$	is the set of <b>AC lines</b> whose flows or variable <b>losses</b> are involved in <b>mixed constraint</b> $v$ (all other terms in the <b>mixed constraint</b> must be excluded from this calculation)
$flowweight_{k,v}$	is the weight associated with the flow on <b>AC Line</b> $k$ in <b>mixed constraint</b> $v$ expressed in <b>canonical form</b>
$lossweight_{k,v}$	is the weight associated with the variable <b>losses</b> on <b>AC Line</b> $k$ in <b>mixed constraint</b> $v$ expressed in <b>canonical form</b>
$flow_{k,p}$	is the flow on <b>AC Line</b> $k$ due to <b>FTR injection pattern</b> $p$ , which equals $\sum_{h \in Hubs} SF_{k,h} \times Inj_{h,p}$
$loss_{k,p}$	is the variable <b>losses</b> on <b>AC Line</b> $k$ due to $flow_{k,p}$
$SF_{k,h}$ and $Inj_{h,p}$	are as defined in subclause (2)

"(5) For the purposes of this clause, if **hub**  $h$  is a group of **nodes**, the positive or negative **hub injection** at **hub**  $h$  must be split into its individual nodal components in a manner consistent with the **hub** definition in the **FTR allocation plan**, and each nodal component must be treated as a separate **hub injection**.

**"8 FTR manager must assign portions of capacities**

- "(1) For each **trading period** of the relevant **billing period**, the **FTR manager** must assign a portion of the capacity of each **AC line**, **AC line loss curve block**, **binding branch constraint RHS** and **binding mixed constraint RHS** (if any) for the purpose of determining amounts to be paid into the **FTR account** under clause 9(3) to (5).
- "(2) The portion of the capacity of each **AC line** to be assigned under subclause (1) must be the minimum of—
- "(a) the line capacity applicable in the **trading period** in the **final pricing schedule**; and
  - "(b) the relevant **branch** participation loading determined under clause 7(1).
- "(3) The portion of the capacity of each **AC line loss curve block** to be assigned under subclause (1) must be the portion of the loss curve block that would be utilised by a flow at the level of the capacity of the associated **AC line** assigned, as determined under subclause (2), assuming that loss curve blocks are utilised in order from lowest to highest **loss factor**, in the direction of flow.
- "(4) Subject to subclause (5), the portion of the capacity of each **binding branch constraint RHS** or **binding mixed constraint RHS** (if any) to be assigned under subclause (1) must be the minimum of—



- "(a) the **constraint RHS** applicable in the **trading period** in the **final pricing schedule**, minus the contribution of any **LHS** terms not involving **AC line** flows or **AC line** variable **losses**, calculated assuming the values of the relevant variables applicable in the **trading period** in the **final pricing schedule**; and
- "(b) the relevant **constraint** participation loading determined under clause 7(3) or clause 7(4).
- "(5) If the capacity determined under subclause (4) for any **constraint** is negative, the capacity to be assigned for that **constraint** must be 0.

**"9 FTR manager must calculate amounts to be paid into FTR account**

- "(1) The amounts calculated under this clause must be calculated using the flow quantities, nodal prices and **shadow prices** from the **final pricing schedule**.
- "(2) The HVDC **loss and constraint excess** to be paid into the **FTR account** for each **trading period** of the relevant **billing period** must be calculated in accordance with the following formula:

$$\max \left( 0, \sum_{n(NI)} price_n \times \left( \sum_{l \in R_{HVDC}(n)} (HVDCLinkFlow_l - HVDCLinkLosses_l) - \sum_{l \in S_{HVDC}(n)} HVDCLinkFlow_l \right) \right) + \sum_{n(SI)} price_n \times \left( \sum_{l \in R_{HVDC}(n)} (HVDCLinkFlow_l - HVDCLinkLosses_l) - \sum_{l \in S_{HVDC}(n)} HVDCLinkFlow_l \right) \div 2$$

where

$price_n$  is the energy price at AC **node**  $n$

$n(NI)$  is the set of North Island AC **nodes** to which any **HVDC links** are connected

$n(SI)$  is the set of South Island AC **nodes** to which any **HVDC links** are connected

$HVDCLinkFlow_l$  is the **MW** flow at the sending end **scheduled** for **HVDC link**  $l$

$HVDCLinkLosses_l$  is the variable **MW losses** for **HVDC link**  $l$

$S_{HVDC}(n)$  is the set of **HVDC links** for which  $n$  is the sending AC **node**

$R_{HVDC}(n)$  is the set of **HVDC links** for which  $n$  is the receiving AC **node**

- "(3) The amount of the **loss and constraint excess** generated by each **AC line** that is to be paid into the **FTR account** must be calculated in accordance with the following formula:

$$AssignedCapacity_k \times ShadowPrice_k \div 2$$

where

$AssignedCapacity_k$  is the portion of the capacity of **AC line  $k$**  assigned under clause 8(1)

$ShadowPrice_k$  is the **shadow price** of the line capacity on **AC line  $k$**

- "(4) The amount of the **loss and constraint excess** generated by each **binding branch constraint** and **binding mixed constraint** (if any) involving **AC line** flow terms or **AC line** variable loss terms to be paid into the **FTR account** must be calculated in accordance with the following formula:

$$AssignedCapacity_v \times ShadowPrice_v \div 2$$

where

$AssignedCapacity_v$  is the portion of the capacity of the **RHS of branch constraint** or **mixed constraint  $v$**  assigned under clause 8(1)

$ShadowPrice_v$  is the **shadow price** of **branch constraint** or **mixed constraint  $v$**

- "(5) The amount of the **loss and constraint excess** generated by each **AC line** loss curve block that is to be paid into the **FTR account** must be calculated in accordance with the following formula:

$$\min(ACLineFlowBlock_{k,j}, AssignedCapacity_{k,j}) \times ReceivingEndPrice_k \\ \times (ACLineLossFactor_{k, \text{marg}} - ACLineLossFactor_{k,j}) \div 2$$

where

$$ACLineLossFactor_{k, \text{marg}} = \min(ACLineLossFactor_{k,j}) \text{ for which } \\ ACLineFlowBlock_{k,j} < ACLineLossMW_{k,j}$$

$ACLineFlowBlock_{k,j}$  is the **MW** flow on the  $j^{th}$  block of the loss curve of **AC line**  $k$  in the direction of **scheduled** positive flow, assuming that loss curve blocks are utilised in order from lowest to highest **loss factor**, in each direction

$AssignedCapacity_{k,j}$  is the portion of the capacity of the  $j^{th}$  block of the loss curve of **AC line**  $k$  assigned under clause 8(1)

$ReceivingEndPrice_k$  is the nodal energy price at the receiving end of the **scheduled** flow on **AC line**  $k$

$ACLineLossFactor_{k,j}$  is the **loss factor** of the  $j^{th}$  block of the loss curve of **AC line**  $k$

$ACLineLossMW_{k,j}$  is the **MW** capacity of the  $j^{th}$  block of the loss curve of **AC line**  $k$

- "(6) The **FTR manager** must calculate the amount of the **loss and constraint excess** that must be paid into the **FTR account** for each **billing period** by—
- (a) determining the sum of the amounts calculated in accordance with subclauses (2) to (5) for each **trading period** of the **billing period**; and
  - (b) determining the sum of the amounts calculated in accordance with paragraph (a) for all **trading periods** of the **billing period**."