

Electricity Industry Participation Code 2010

Part 12 Transport

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Subpart 1—General

12.1 Contents of this Part

This Part relates to the following aspects of transmission:

- (a) **transmission agreements** (subpart 2):
- (b) **grid** reliability and industry information (subpart 3):
- (c) the **transmission pricing methodology** (subpart 4):
- (d) *[Revoked]*
- (e) **interconnection asset** services (subpart 6):
- (f) the **Outage Protocol** (subpart 7).

Compare: Electricity Governance Rules 2003 rule 1 section I part F

Clause 12.1(d): revoked, on 1 October 2011, by clause 5 of the Electricity Industry Participation (Financial Transmission Rights) Code Amendment 2011.

12.2 Discretion to waive Code requirements

- (1) The **Authority** may agree to waive Code requirements under this Part if, before the commencement of an amendment to this Part,—
 - (a) **Transpower** or any other **participant** required to complete actions under this Code has in substance done what it would have been required to do under this Code; and
 - (b) the **Authority** is satisfied that the actions have been completed.
- (2) If the **Authority** agrees to waive Code requirements under subclause (1), the **Authority** must **publish** its decision and reasons for agreeing to waive Code requirements.

Compare: Electricity Governance Rules 2003 rule 2 section I part F

12.3 Interaction between Parts 7 and 8 and this Part

- (1) The **principal performance obligations** in relation to the real time delivery of **common quality** and **dispatch** under Part 7 relate to the functions and obligations of the **system operator**.
- (2) When it is exercising its functions and powers under this Part, the **Authority** must have regard to the desirability of Parts 7 and 8 and this Part operating in an integrated and consistent manner.
- (3) The performance or non-performance of a function or obligation of the **system operator** under Parts 7 or 8, and a claim against the **system operator** under Parts 7 or 8, is

without prejudice to the functions and obligations of **Transpower** under this Part.

- (4) The performance or non-performance of a function or obligation of **Transpower** under this Part, and any claim against **Transpower** under this Part or a **transmission agreement**, is without prejudice to the functions and obligations of the **system operator** under Parts 7 or 8.

Compare: Electricity Governance Rules 2003 rule 3 section I part F

Subpart 2—Transmission agreements

12.4 Contents of this subpart

This subpart deals with **transmission agreements**, and provides for the following:

- (a) a process for the **Authority** to determine the structure of **transmission agreements**:
- (b) the categories of **participants** that must enter into **transmission agreements**:
- (c) an obligation on **Transpower** and **designated transmission customers** to enter into **transmission agreements**:
- (d) matters to be included in **transmission agreements**:
- (e) a process for the **Authority** to determine **benchmark agreements** that—
 - (i) provide the basis for the negotiation of **transmission agreements**; or
 - (ii) act as a default **transmission agreement** if **Transpower** and a **designated transmission customer** fail to execute a **transmission agreement**:
- (f) a process for the **Authority** to determine a **Connection Code**:
- (g) a process for variations in **transmission agreements** from **benchmark agreements**:
- (h) a process for resolving disputes arising from the negotiation of **transmission agreements**, and the application of the **benchmark agreement** as a default **transmission agreement**:
- (i) existing agreements.

Compare: Electricity Governance Rules 2003 rule 1 section II part F

12.5 Structure for transmission agreements

- (1) The structure for **transmission agreements** that applies at the commencement of this Code is the structure for **transmission agreements** published by the Electricity Commission under rule 2 of section II of part F of the **rules** on 21 May 2007.
- (2) Until the **Authority** reviews the structure for **transmission agreements**, it must continue to **publish** the structure referred to in subclause (1).

Compare: Electricity Governance Rules 2003 rule 2.1.2 section II part F

12.6 Review of structure for transmission agreements

- (1) This clause applies if the **Authority** wishes to review the structure for **transmission agreement** referred to in clause 12.5, or a structure for **transmission agreements** determined by the **Authority** under this clause.
- (2) The **Authority** must **publish** a proposed structure for **transmission agreements**.
- (3) When the **Authority publishes** its proposed structure, the **Authority** must advise

registered participants of the date by which submissions on the proposed structure are to be received by the **Authority**. The date must be no earlier than 15 **business days** from the date of **publication** of the proposed structure.

- (4) Each submission on the proposed structure must be made in writing to the **Authority** and received on or before the **submission expiry date**. In addition to receiving written submissions, the **Authority** may elect to hear 1 or more oral submissions.
- (5) Within 20 **business days** after the **submission expiry date** (or such longer period as the **Authority** may allow), the **Authority** must complete its consideration of all submissions it receives and determine an appropriate **transmission agreement** structure.
- (6) The **transmission agreement** structure determined by the **Authority** under this clause must be the structure of the **benchmark agreements** to be developed and approved by the **Authority** under clauses 12.27 to 12.34.

Compare: Electricity Governance Rules 2003 rules 2.1.3 to 2.1.5 section II part F
Clause 12.6(3): amended, on 1 November 2018, by clause 73 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2018.

12.7 Categories of participants required to enter into transmission agreements

- (1) The categories of **designated transmission customers** required to enter into **transmission agreements** with **Transpower** under clause 12.8 are as specified in Schedule 12.1.
- (2) The **Authority** must record in the **register** whether a **registered participant** is a **designated transmission customer**.
- (3) Registration has no effect on a **participant's** status as a **designated transmission customer**.

Compare: Electricity Governance Rules 2003 rule 2.2 section II part F

Transpower and designated transmission customers must enter transmission agreements

12.8 Obligation to enter transmission agreements

Transpower and **designated transmission customers** must enter into **transmission agreements**.

Compare: Electricity Governance Rules 2003 rule 3.1.1 section II part F

12.9 When designated transmission customer must enter into transmission agreement

A **participant** who becomes a **designated transmission customer** must enter into a **transmission agreement** with **Transpower** within 2 months after the **participant** becomes a **designated transmission customer**.

Compare: Electricity Governance Rules 2003 rule 3.1.2.3 section II part F

12.10 Benchmark agreements to be default transmission agreements

- (1) Subject to clauses 12.49 and 12.50, if, at the expiry of 2 months after a **participant** becomes a **designated transmission customer**, the **designated transmission customer** and **Transpower** have not entered into a **transmission agreement** in accordance with clause 12.9, the **benchmark agreement** applies as a binding contract between the

designated transmission customer and **Transpower**, and the **designated transmission customer** and **Transpower** must comply with the process specified in this clause.

(2) If this clause applies:

- (a) within 10 **business days** of the date that is 2 months after the **participant** became a **designated transmission customer**, the **designated transmission customer** must provide **Transpower**, at the address for service for **Transpower** registered at the New Zealand Companies Office, with—
 - (i) the **designated transmission customer's** full name; and
 - (ii) the **designated transmission customer's** physical address, postal address and electronic address to which notices under the default **transmission agreement** are to be sent; and
 - (iii) the name of the contact person of the **designated transmission customer** to whom such notices should be addressed:
- (b) by the date 20 **business days** after the receipt of the **designated transmission customer's** details under paragraph (a), **Transpower** must provide the **designated transmission customer** with a draft default **transmission agreement** completed in accordance with the **benchmark agreement**, which must include the following:
 - (i) the **designated transmission customer's** details as provided under paragraph (a):
 - (ii) **Transpower's** physical address, postal address and electronic address to which notices under the default **transmission agreement** are to be sent:
 - (iii) the contact person to whom notices under the default **transmission agreement** should be addressed:
 - (iv) **Transpower's** designated bank account for the purposes of receiving payments under the default **transmission agreement**:
 - (v) a draft Schedule 1, which sets out the **connection locations, points of service** and **points of connection** of the **assets** owned or operated by the **designated transmission customer** to the **grid**:
 - (vi) a draft Schedule 4 setting out, in the same form as the diagram in Schedule 4 of the **benchmark agreement**, the configuration of the **connection assets** in relation to each **connection location** listed in Schedule 1:
 - (vii) a draft Schedule 5 setting out proposed service levels for each **connection location** listed in Schedule 1 determined in accordance with subclause (3):
 - (viii) if applicable, a draft Schedule 6, including identifying the facilities, facilities area, and land that are to be subject to the access and occupation terms set out in the schedule and the licence charges under the schedule:
- (c) the **designated transmission customer** and **Transpower** may discuss the schedules proposed under paragraph (b)(v) to (viii), as a result of which **Transpower** may amend any of the schedules:
- (d) the **designated transmission customer** must advise **Transpower** in writing no later than 20 **business days** after receiving the draft default **transmission agreement** under paragraph (b) whether—

- (i) it accepts the schedules as proposed by **Transpower** under paragraph (b)(v) to (viii); or
 - (ii) if **Transpower** has amended any of those schedules under paragraph (c), it accepts the schedules as amended.
- (3) The service levels set out in Schedule 5 of a default **transmission agreement** must be determined on the following basis:
 - (a) the capacity service levels for each **branch** must be consistent with—
 - (i) the capacities of the **branch** or component **assets** in the most recent **asset capability statement** provided by **Transpower** under clause 2(5) of **Technical Code A** of Schedule 8.3; or
 - (ii) if the relevant information is not contained in the **asset capability statement**, the **manufacturer's specification** for the component **assets**:
 - (b) the service levels for the voltage range specified in the capacity service measures for each **branch** must be consistent with,—
 - (i) for **assets** of voltages of 50kV or above,—
 - (A) the voltage ranges for the component **assets** specified in the **AOPOs**, if any; or
 - (B) the voltage range specified in any **equivalence arrangement** approved or any **dispensation** granted under clauses 8.29 to 8.31 in respect of any **asset** that does not comply with the voltage range specified in the **AOPOs**; or
 - (ii) for assets of voltages less than 50kV, the normal operating voltage of the component **assets**:
 - (c) **Transpower** must ensure that each **connection asset** is included in a **branch**:
 - (d) the availability and reliability service levels must—
 - (i) be set at a level equivalent to the average annual availability and reliability at each **point of service** subject to the default **transmission agreement** over the 5 year period (being years ending 30 June) immediately before the date that is 2 months after the **participant** became a **designated transmission customer**; or
 - (ii) if a **point of service** subject to the default **transmission agreement** has not been in existence for 5 years (being years ending 30 June) before the date referred to in subparagraph (i), reflect a reasonable estimate of the expected availability and reliability at the **point of service** having regard to the performance data available for the **point of service** and average annual availability and reliability of **assets** similar to the **connection assets** at the **connection location** at which the **point of service** is located:
 - (e) the reporting and response service levels must be consistent with **Transpower's** practices existing on the date that is 2 months after the **participant** became a **designated transmission customer**, including **Transpower's** documented policies and procedures, and must not result in changes to the management or operation of the **grid** that could materially affect **Transpower** or any other **participant** or end use customer, or require **Transpower** to materially alter the level of its normal on-going **grid** expenditure.

- (4) If the **designated transmission customer** accepts the schedules as proposed by **Transpower** under subclause (2)(b)(v) to (viii), or as amended by **Transpower** under subclause (2)(c), the default **transmission agreement** applies as a binding contract between **Transpower** and the **designated transmission customer** from the date that is 2 months after the **participant** became a **designated transmission customer**.
- (5) If **Transpower** and a **designated transmission customer** are unable to agree on the terms of any of the schedules to a default **transmission agreement** proposed by **Transpower** under subclause (2)(b)(v) to (viii), or as amended by **Transpower** under subclause (2)(c), either party may refer the matter to the **Rulings Panel** for determination under clauses 12.45 to 12.48.
- (6) If a dispute is referred to the **Rulings Panel**, under subclause (5)—
 - (a) the default **transmission agreement** as determined by the **Rulings Panel** in accordance with clauses 12.45 to 12.48 applies as a binding agreement between **Transpower** and the **designated transmission customer** from the date that is 2 months after the **participant** became a **designated transmission customer** or the date on which the **Rulings Panel** makes its determination or its determination is expressed to come into effect, whichever is later; and
 - (b) if the **Rulings Panel** has not made a determination by the date that is 2 months after the **participant** became a **designated transmission customer**, the draft default **transmission agreement** provided under subclause (2)(b) applies as a binding agreement between **Transpower** and the **designated transmission customer** until the date on which the **Rulings Panel** makes its determination or the determination comes into effect.

Compare: Electricity Governance Rules 2003 rule 3.1.3 section II part F

Clause 12.10(1): amended, on 16 December 2013, by clause 5 of the Electricity Industry Participation (Revocation of Part 16) Code Amendment 2013.

Clause 12.10(2)(a)(ii) and (b)(ii): amended, on 5 October 2017, by clause 287 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

12.11 Subsequent transmission agreements

If a **benchmark agreement** applies as a default **transmission agreement**, the **benchmark agreement** may be superseded by a subsequent **transmission agreement** entered into by **Transpower** and the **designated transmission customer**.

Compare: Electricity Governance Rules 2003 rule 3.1.4 section II part F

12.12 Changes to connection assets under default transmission agreements

- (1) If **Transpower** reconfigures, replaces, enhances, or permanently removes a **connection asset** from service in accordance with the provisions of a default **transmission agreement** that applies under clauses 12.10 or 12.13,—
 - (a) within 20 **business days**, to the extent necessary, **Transpower** must provide the **designated transmission customer** who is a party to that agreement with a revised Schedule 1, a revised Schedule 4, and a revised Schedule 5 for that agreement, reflecting any changes to the description of the **connection locations**, **points of service**, or **points of connection** in Schedule 1, the diagram in Schedule 4, or to the service levels specified in Schedule 5 resulting from the replacement or enhancement of the **connection asset**; and

- (b) the **designated transmission customer** and **Transpower** may discuss the revised schedules, as a result of which **Transpower** may amend any of the revised schedules; and
 - (c) the **designated transmission customer** must advise **Transpower** within 20 **business days** of receiving the revised schedules under paragraph (a) whether—
 - (i) it accepts the revised schedules as proposed by **Transpower** under paragraph (a); or
 - (ii) if **Transpower** has amended any of those revised schedules under paragraph (b), it accepts the revised schedules as amended; and
 - (d) the revised schedules apply under the default **transmission agreement** from the date that acceptance is received by **Transpower** under paragraph (c).
- (2) If the **designated transmission customer** does not accept the revised schedules under subclause (1)(c), either party may refer the matter to the **Rulings Panel** for determination under clauses 12.45 to 12.48.
- (3) If a dispute is referred to the **Rulings Panel** in accordance with subclause (2)—
- (a) the revised schedules proposed by **Transpower** under subclause (1)(a) apply from the date on which **Transpower** provides the **designated transmission customer** with the revised schedules under subclause (1)(a) until the date on which the **Rulings Panel** makes its determination or the determination comes into effect; and
 - (b) the revised schedules as determined by the **Rulings Panel** under clauses 12.45 to 12.48 apply under the default **transmission agreement** from the date determined by the **Rulings Panel**.

Compare: Electricity Governance Rules 2003 rule 3.1.5 section II part F

12.13 Expiry or termination of transmission agreements

If a **transmission agreement**, or an existing written agreement to which clause 12.49 applies, expires or terminates on or after the date that is 2 months after the **participant** became a **designated transmission customer** and **Transpower** and the **designated transmission customer** do not enter into a new **transmission agreement** within 2 months of that date, the following procedure applies:

- (a) within 10 **business days**, the **designated transmission customer** must provide **Transpower**, at the address for service for **Transpower** registered at the New Zealand Companies Office, with—
 - (i) the **designated transmission customer's** full name; and
 - (ii) the **designated transmission customer's** physical address, postal address and electronic address to which notices under the default **transmission agreement** are to be sent; and
 - (iii) the name of the contact person of the **designated transmission customer** to whom such notices should be addressed:
- (b) within 20 **business days** of receipt of the **designated transmission customer's** details under paragraph (a), **Transpower** must provide the **designated transmission customer** with a draft default **transmission agreement** completed in accordance with the **benchmark agreement**, which must include—

- (i) the **designated transmission customer's** details as provided under paragraph (a); and
 - (ii) **Transpower's** physical address, postal address and electronic address to which notices under the default **transmission agreement** are to be sent; and
 - (iii) the contact person to whom notices under the default **transmission agreement** should be addressed; and
 - (iv) **Transpower's** designated bank account for the purposes of receiving payments under the default **transmission agreement**; and
 - (v) a draft Schedule 1, which sets out the **connection locations, points of service and points of connection** of the **assets** owned or operated by the **designated transmission customer** to the **grid**; and
 - (vi) a draft Schedule 4 setting out, in the same form as the diagram in Schedule 4 of the **benchmark agreement**, the configuration of the **connection assets** in relation to each **connection location** listed in Schedule 1; and
 - (vii) a draft Schedule 5 setting out proposed service levels for each **connection location** listed in Schedule 1 determined in accordance with clause 12.10(3); and
 - (viii) if applicable, a draft Schedule 6, including identifying the facilities, facilities area, and land that are to be subject to the access and occupation terms set out in that schedule and the licence charges under that schedule:
- (c) the **designated transmission customer** and **Transpower** may discuss the schedules proposed under paragraph (b)(v) to (viii), as a result of which **Transpower** may amend any of the schedules:
- (d) the **designated transmission customer** must advise **Transpower** in writing within 20 **business days** of receiving the draft default **transmission agreement** under paragraph (b) above whether—
- (i) it accepts the schedules as proposed by **Transpower** under paragraph (b)(v) to (viii); or
 - (ii) if **Transpower** has amended any of those schedules under paragraph (c), it accepts the schedules as amended:
- (e) if the **designated transmission customer** accepts the schedules as proposed by **Transpower** under paragraph (b)(v) to (viii), or as amended by **Transpower** under paragraph (c), the default **transmission agreement** applies as a binding contract between **Transpower** and the **designated transmission customer**, effective from the date on which the previous **transmission agreement** or existing written agreement to which clause 12.49 applies expired:
- (f) if **Transpower** and a **designated transmission customer** are unable to agree on the terms of any of the schedules to a default **transmission agreement** proposed by **Transpower** under paragraph (b)(v) to (viii), or as amended by **Transpower** under paragraph (c), either party may refer the matter to the **Rulings Panel** for determination under clauses 12.45 to 12.48:
- (g) if a dispute has been referred to the **Rulings Panel** in accordance with paragraph (f)—
- (i) the draft default **transmission agreement** provided under paragraph (b)

applies as a binding agreement between **Transpower** and the **designated transmission customer**, effective from the date on which the previous **transmission agreement** or existing written agreement to which clause 12.49 applies expired, until the date on which the **Rulings Panel** makes its determination or the determination comes into effect; and

- (ii) the default **transmission agreement** as determined by the **Rulings Panel** in accordance with clauses 12.45 to 12.48 applies as a binding agreement between **Transpower** and the **designated transmission customer** from the date determined by the **Rulings Panel**.

Compare: Electricity Governance Rules 2003 rule 3.1.6 section II part F
Clause 12.13(a)(ii) and (b)(ii): amended, on 5 October 2017, by clause 288 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Content of transmission agreements

12.14 Transmission agreements to be consistent with benchmark agreements and grid reliability standards

Subject to clauses 12.35 to 12.38, a **transmission agreement** entered into between **Transpower** and a **designated transmission customer** under clause 12.8 must be consistent in all material respects with—

- (a) the **benchmark agreement**; and
 - (b) the **grid reliability standards**,—
- as at the date the **transmission agreement** is entered into.

Compare: Electricity Governance Rules 2003 rule 3.2.1 section II part F

12.15 Transpower to publish information about transmission agreements and provide them on request

- (1) **Transpower** must **publish** and update annually a list of all **transmission agreements** it has with **designated transmission customers** that includes, in respect of each **transmission agreement** contained in the list, the following information:
 - (a) the full name of the **designated transmission customer** that is a party to the **transmission agreement**; and
 - (b) the date on which the **transmission agreement** was executed; and
 - (c) whether the **transmission agreement** includes any material variations from the **benchmark agreement**; and
 - (d) if the **transmission agreement** includes any material variations from the **benchmark agreement**, a description of the variations; and
 - (e) if any schedule to the **transmission agreement** has been revised in accordance with clause 12.12, the date from which the revised schedule began to apply.
- (2) A person may request from **Transpower** a copy of a **transmission agreement** that **Transpower** has with a **designated transmission customer**, and **Transpower** must provide a copy to the person as soon as practicable after receiving the request.

- (3) Despite subclause (2), **Transpower** may refuse to provide information from a **transmission agreement** if it considers that there would be grounds for withholding the information under the Official Information Act 1982.

Compare: Electricity Governance Rules 2003 rule 3.2.2 section II part F

Clause 12.15: substituted, on 1 February 2016, by clause 46 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Connection Code

12.16 Connection Code

- (1) The **Connection Code** set out in schedule F2 of section II of part F of the **rules** immediately before this Code came into force, continues in force and is deemed to be the **Connection Code** that applies at the commencement of this Code, with the following amendments:
- (a) every reference to the **rules** must be read as a reference to the Code;
 - (b) every reference to a provision of the **rules** must be read as a reference to the corresponding provision of the Code.
- (2) The **Authority** must, as soon as practicable after this Code comes into force, publish a version of the **Connection Code** in which the provisions of this Code that correspond to the provisions of the **rules** referred to in the **Connection Code** are shown.
- (3) Clause 12.26 applies to the **Connection Code**.

12.17 Purpose of Connection Code

The purpose of the **Connection Code** is to set out the technical requirements and standards that **designated transmission customers** must meet in order to be connected to the **grid** and that **Transpower** must comply with. **Transpower** and **designated transmission customers** must comply with the **Connection Code** under default **transmission agreements** that apply under clauses 12.10 and 12.13.

Compare: Electricity Governance Rules 2003 rule 3.3.1 section II part F

Clause 12.17: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Clause 12.17: amended, on 5 October 2017, by clause 289 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

12.18 Review of Connection Code

- (1) The **Authority** may review the **Connection Code** at any time.
- (2) Clauses 12.19 to 12.25 apply to any such review.

Compare: Electricity Governance Rules 2003 rule 3.3.10 section II part F

12.19 Transpower to submit Connection Code

- (1) **Transpower** must submit a proposed **Connection Code** to the **Authority** within 90 days (or such longer period as the **Authority** may allow) of receipt of a written request from the **Authority**. The **Authority** may issue such a request at any time. The proposed **Connection Code** must provide for the matters set out in clause 12.20 and give effect to the principles set out in clause 12.21.
- (2) With its proposed **Connection Code**, **Transpower** must submit to the **Authority** an explanation of the proposed **Connection Code** and a **statement of proposal** for the

proposed **Connection Code**.

Compare: Electricity Governance Rules 2003 rule 3.3.2 section II part F

12.20 Required content of Connection Code

The **Connection Code** must provide for the following matters:

- (a) connection requirements for **designated transmission customers**:
- (b) technical requirements for **assets**, including **assets** owned by **Transpower**, and for other equipment and plant that is connected to a **local network** or an **embedded network** or that forms part of an **embedded network** or **embedded generating station** if the operation of that equipment and plant could affect the **grid assets**:
- (c) operating standards for equipment that is owned by a **designated transmission customer**, used in relation to the conveyance of **electricity**, and that is situated on land owned by **Transpower**:
- (d) information requirements to be met by **designated transmission customers** before equipment is connected to the **grid** and before changes are made to the equipment:
- (e) an obligation on **Transpower** to provide a 10 year forecast of the expected maximum fault level of each point of service to **designated transmission customers** set out in the **transmission agreement** between **Transpower** and each **designated transmission customer**.

Compare: Electricity Governance Rules 2003 rule 3.3.3 section II part F

Clause 20.20: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Clause 12.20(a): amended, on 5 October 2017, by clause 290(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 12.20(b) and (d): amended, on 5 October 2017, by clause 290(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 12.20(c): amended, on 5 October 2017, by clause 290(3) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 12.20(e): amended, on 5 October 2017, by clause 290(4) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

12.21 Principles for developing Connection Code

The **Connection Code** must give effect to the following principles:

- (a) the principles of the **benchmark agreement** in clause 12.30:
- (b) the desirability of the **Connection Code** and Part 8 operating in an integrated and consistent manner, if possible:
- (c) the need to ensure that the **grid owner** can meet all obligations placed on it by the **system operator** for the purpose of meeting common security and power quality requirements under Part 8:
- (d) the need to ensure that the safety of all personnel is maintained:
- (e) the need to ensure that the safety and integrity of equipment is maintained.

Compare: Electricity Governance Rules 2003 rule 3.3.4 section II part F

12.22 Authority may initially approve proposed Connection Code or refer back to Transpower

- (1) After consideration of **Transpower's** proposed **Connection Code**, and accompanying

explanation and **statement of proposal**, the **Authority** may—

- (a) provisionally approve the proposed **Connection Code** having regard to the matters set out in clause 12.20 and the principles in clause 12.21; or
 - (b) refer the proposed **Connection Code** and accompanying explanation and **statement of proposal** back to **Transpower** if, in the **Authority's** view,—
 - (i) the proposed **Connection Code** does not contain the matters set out in clause 12.20; or
 - (ii) the proposed **Connection Code** does not adequately provide for the principles in clause 12.21; or
 - (iii) the explanation or **statement of proposal** provided with the proposed **Connection Code** in accordance with clause 12.19(2) is inadequate.
- (2) **Transpower** may, no later than 20 **business days** (or such longer period as the **Authority** may allow) after the **Authority** advises **Transpower** of its decision under subclause (1), consider the **Authority's** concerns and resubmit its proposed **Connection Code** and accompanying explanation and **statement of proposal** for consideration by the **Authority**.

Compare: Electricity Governance Rules 2003 rule 3.3.5 section II part F
Clause 12.22(2): amended, on 1 November 2018, by clause 74 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2018.

12.23 Amendment of proposed Connection Code by Authority

If the **Authority** considers that the **Connection Code** resubmitted by **Transpower** under clause 12.22(b) does not adequately provide for the matters set out in clause 12.20 or adequately give effect to the principles in clause 12.21, the **Authority** may make any amendments to the proposed **Connection Code** it considers necessary.

Compare: Electricity Governance Rules 2003 rule 3.3.6 section II part F

12.24 Authority must consult on proposed Connection Code

- (1) The **Authority** must **publish** the proposed **Connection Code**, either as provisionally approved by the **Authority** or as amended by the **Authority**, as soon as practicable, for consultation with any person that the **Authority** thinks is likely to be materially affected by the proposed **Connection Code**.
- (2) As well as the consultation required under subclause (1), the **Authority** may undertake any other consultation it considers necessary.

Compare: Electricity Governance Rules 2003 rules 3.3.7 and 3.3.8 section II part F

12.25 Decision on Connection Code

- (1) When the **Authority** has completed its consultation on the proposed **Connection Code** it must consider whether to incorporate the **Connection Code** by reference in this Code.
- (2) If the **Authority** decides to incorporate the **Connection Code** by reference in this Code, the **Authority** must determine a date on which the incorporation by reference takes effect and comply with Schedule 1 of the **Act** in relation to it.

Compare: Electricity Governance Rules 2003 rule 3.3.9 section II part F

12.26 Incorporation of Connection Code by reference

- (1) The **Connection Code** is incorporated by reference in this Code in accordance with section 32 of the **Act**.
- (2) Subclause (1) is subject to Schedule 1 of the **Act**, which includes a requirement that the **Authority** must give notice in the *Gazette* before an amended or substituted **Connection Code** becomes incorporated by reference in this Code.

Clause 12.26(1): amended, on 5 October 2017, by clause 291 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Benchmark agreements for connection to and/or use of the grid

12.27 Benchmark agreement

- (1) The **benchmark agreement** set out in schedule F2 of section II of part F of the **rules** immediately before this Code came into force, continues in force and is deemed to be the **benchmark agreement** that applies at the commencement of this Code, with the following amendments:
 - (a) every reference to the Board must be read as a reference to the **Authority**;
 - (b) every reference to the **rules** must be read as a reference to the Code;
 - (c) every reference to the Electricity Governance Regulations must be read as a reference to the Code;
 - (d) every reference to a provision of the **rules** or the Electricity Governance Regulations must be read as a reference to the corresponding provision of the Code;
 - (e) the references in clause 40.2 to the value of unserved energy in schedule F4 of section III of part F of the **rules** must be read as references to the **value of expected unserved energy** in clause 4 of Schedule 12.2;
 - (f) the reference in clause 40.2(f)(2) to **Transpower** asking the Board of the Electricity Commission to request **Transpower** to submit a grid upgrade plan must be read as a reference to **Transpower** asking the Commerce Commission under clause 12.44 to request **Transpower** to submit an investment proposal.
- (2) The **Authority** must, as soon as practicable after this Code comes into force, publish a version of the **benchmark agreement** in which the provisions of this Code that correspond to the provisions of the **rules** referred to in the **benchmark agreement** are shown.
- (3) Clause 12.34 applies to the **benchmark agreement**.

Clause 12.27(1)(e): amended, on 1 February 2016, by clause 47 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

12.28 Authority may initiate review

- (1) Having regard to the statutory objective of the **Authority** in section 15 of the **Act** and to the principles for **benchmark agreements** set out in clause 12.30, the **Authority** may initiate a review of a **benchmark agreement** at any time. Reviews of the **Connection Code** must be carried out in accordance with clause 12.18.
- (2) A review of a **benchmark agreement** must follow the purpose, process and principles in clauses 12.29 to 12.33.

Compare: Electricity Governance Rules 2003 rule 7 section II part F

12.29 Purpose of benchmark agreements

The purpose of **benchmark agreements** is to—

- (a) facilitate commercial arrangements between **Transpower** and **designated transmission customers** by providing a basis for negotiating **transmission agreements** required under clause 12.8 that meet the particular requirements of **Transpower** and **designated transmission customers**; and
- (b) act as a default **transmission agreement** if **Transpower** and a **designated transmission customer** fail to enter into a **transmission agreement** by the date that is 2 months after the **participant** became a **designated transmission customer**.

Compare: Electricity Governance Rules 2003 rule 4.1 section II part F

12.30 Principles for benchmark agreements

A **benchmark agreement** should—

- (a) reflect a fair and reasonable balance between the requirements of **designated transmission customers** and the legitimate interests of **Transpower** as **asset owner**; and
- (b) reflect the interests of end use customers; and
- (c) reflect the reasonable requirements of **designated transmission customers** at the **grid injection points** and **grid exit points**, and the ability of **Transpower** to meet those requirements; and
- (d) reflect the differing needs of different classes of **designated transmission customers**; and
- (e) be appropriate to the technical requirements of services provided at the **point of connection** to the **grid**, but not duplicate requirements that are more appropriately included in the **grid reliability standards**; and
- (f) establish common standards for a common configuration based on factors such as size of connection and voltage level; and
- (g) encourage efficient and effective processes for enforcement of obligations and dispute resolution.

Compare: Electricity Governance Rules 2003 rule 4.2 section II part F

Clause 12.30(f): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Clause 12.30(f): amended, on 5 October 2017, by clause 292 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

12.31 Contents of benchmark agreements

(1) A **benchmark agreement** must include—

- (a) an obligation on the parties to design, construct, maintain and operate all relevant plant and equipment in accordance with—
 - (i) relevant laws; and
 - (ii) the requirements of this Code (including obligations on **designated transmission customers** to provide information to facilitate system planning, as set out in clause 12.54); and

- (iii) **good electricity industry practice** and applicable New Zealand technical and safety standards; and
 - (b) an obligation on **designated transmission customers** to comply with **Transpower's** reasonable technical connection and safety requirements; and
 - (c) an obligation on **designated transmission customers** to pay prices calculated in accordance with the **transmission pricing methodology** approved by the **Authority** under subpart 4; and
 - (d) arbitration or mediation processes for resolving disputes; and
 - (e) service definitions, service levels, and service measures to the extent practicable for transmission services, other than the services to which the clauses in subpart 6 apply.
- (2) A **benchmark agreement** must be consistent in all material respects with the **grid reliability standards**.

Compare: Electricity Governance Rules 2003 rule 4.3 section II part F

Clause 12.31(1)(b): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Clause 12.31(1)(b): amended, on 5 October 2017, by clause 293 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

12.32 Authority must consult on draft benchmark agreement

- (1) The **Authority** must **publish** draft **benchmark agreements**.
- (2) When the **Authority publishes** a draft **benchmark agreement**, the **Authority** must advise **registered participants** of the date (which must not be earlier than **15 business days** after the date of publication of the draft **benchmark agreement**) by which submissions on the draft **benchmark agreement** must be received by the **Authority**.
- (3) Each submission on a draft **benchmark agreement** must be made in writing to the **Authority** and received on or before the **submission expiry date**. In addition to receiving written submissions, the **Authority** may elect to hear 1 or more oral submissions.

Compare: Electricity Governance Rules 2003 rules 4.4 and 4.5 section II part F

Clause 12.32(2): amended, on 1 November 2018, by clause 75 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2018.

12.33 Decision on benchmark agreement

- (1) Within **20 business days** after the **submission expiry date** (or such longer period as the **Authority** may allow), the **Authority** must complete its consideration of all submissions it receives on the draft **benchmark agreement** and consider whether to **incorporate** the draft **benchmark agreement** by reference as the **benchmark agreement**.
- (2) If the **Authority** decides to incorporate the **benchmark agreement** by reference in this Code, the **Authority** must determine a date on which the incorporation by reference takes effect and comply with Schedule 1 of the **Act** in relation to it.

Compare: Electricity Governance Rules 2003 rule 4.6 section II part F

12.34 Incorporation of benchmark agreement by reference

- (1) The **benchmark agreement** is incorporated by reference in this Code in accordance with section 32 of the **Act**.

- (2) Subclause (1) is subject to Schedule 1 of the **Act**, which includes a requirement that the **Authority** must give notice in the *Gazette* before an amended or substituted **benchmark agreement** becomes incorporated by reference in this Code.

Clause 12.34(1): amended, on 5 October 2017, by clause 294 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Variations from benchmark agreements and grid reliability standards and enhancement and removal of connection assets

12.35 Increased service levels and reliability

- (1) This clause applies if—
- (a) a proposed **transmission agreement** is not consistent in all material respects with the **benchmark agreement** because it increases the service levels above those that would apply if the **benchmark agreement** applied in accordance with clauses 12.10 or 12.13; or
 - (b) subject to clause 12.39, a proposed **transmission agreement** or other agreement between **Transpower** and a **designated transmission customer** increases the level of reliability above the **grid reliability standards** for a particular **grid injection point** or **grid exit point**.
- (2) If this clause applies, the parties to the proposed **transmission agreement** must confirm in writing to the **Authority** that—
- (a) they have consulted with affected end use customers in relation to—
 - (i) the proposed service levels or the proposed increase in reliability; and
 - (ii) any resulting price implications; and
 - (b) there are no material unresolved issues affecting the interests of those end use customers.

Compare: Electricity Governance Rules 2003 rule 5.1 section II part F

Clause 12.35 Heading: amended, on 15 May 2014, by clause 32(a) of the Electricity Industry Participation (Minor Code Amendments) Code Amendment 2014.

Clause 12.35(1)(a): amended, on 15 May 2014, by clause 32(b) of the Electricity Industry Participation (Minor Code Amendments) Code Amendment 2014.

Clause 12.35(2): replaced, on 5 October 2017, by clause 295 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

12.36 Decreased service levels and reliability

- (1) This clause applies if—
- (a) a proposed **transmission agreement** is not consistent in all material respects with the **benchmark agreement** because it decreases the service levels below those that would apply if the **benchmark agreement** applied in accordance with clauses 12.10 or 12.13; or
 - (b) subject to clause 12.39, a proposed **transmission agreement** or other agreement between **Transpower** and a **designated transmission customer** decreases the level of reliability below the **grid reliability standards** for a particular **grid injection point** or **grid exit point**.
- (2) If this clause applies, the parties must obtain the **Authority's** approval of the proposed service levels or the lower level of reliability.
- (3) The parties must satisfy the **Authority** that the **Authority** should grant an approval under subclause (2), having regard to any potential material adverse impacts of the

proposed service levels or the lower level of reliability on—

- (a) current and future service levels or reliability for any affected **designated transmission customer** or end use customer; and
- (b) the price paid for transmission or distribution services, or **electricity**, by any affected **designated transmission customer** or end use customer.

Compare: Electricity Governance Rules 2003 rule 5.2 section II part F

Clause 12.36 Heading: amended, on 15 May 2014, by clause 33(a) of the Electricity Industry Participation (Minor Code Amendments) Code Amendment 2014.

Clause 12.36(1)(a): amended, on 15 May 2014, by clause 33(b) of the Electricity Industry Participation (Minor Code Amendments) Code Amendment 2014.

12.37 Variations that may increase or decrease reliability

If it is uncertain whether, subject to clause 12.39, a proposed **transmission agreement** or other agreement increases or decreases the service levels from those that would apply if the **benchmark agreement** applied, or whether a proposed **transmission agreement** or other agreement increases or decreases the level of reliability above or below the **grid reliability standards**, for a particular **grid injection point** or **grid exit point**, the parties must obtain the **Authority's** approval described in clause 12.36(2).

Compare: Electricity Governance Rules 2003 rule 5.3 section II part F

12.38 Other variations from terms of benchmark agreements

- (1) This clause applies if a proposed **transmission agreement** to be entered into by **Transpower** and a **designated transmission customer** under clause 12.8 is not consistent in all material aspects with the **benchmark agreement**, other than a situation to which clauses 12.35 to 12.37 apply.
- (2) If this clause applies, the parties must obtain the **Authority's** approval to the proposed variation from the **benchmark agreement**. The parties to the proposed **transmission agreement** must satisfy the **Authority** that they have consulted with any affected end use customers and **designated transmission customers** in relation to the proposed variation, and there are no material unresolved issues affecting the interests of those persons.

Compare: Electricity Governance Rules 2003 rule 5.4 section II part F

12.39 Customer specific value of expected unserved energy

- (1) *[Revoked]*
- (2) **Transpower** or a **designated transmission customer** may apply to the **Authority**—
 - (a) if permitted under a **transmission agreement**, for provisional approval to use a different **value of expected unserved energy** than the value specified in clause 4 of Schedule 12.2 for the purposes of determining whether to replace or enhance **connection assets** as provided for under that **transmission agreement**; or
 - (b) for approval to use a different **value of expected unserved energy** than the value specified in clause 4 of Schedule 12.2 for the purposes of applying the **grid reliability standards** under clauses 12.35 to 12.37 for a **grid injection point** or **grid exit point**, regardless of whether **Transpower** or the **designated transmission customer** has applied for the **Authority's** provisional approval under subclause (4).

- (3) An application under subclause (2) must be made in writing to the **Authority**—
- (a) in the case of an application under subclause (2)(a), within 20 **business days** of the **designated transmission customer** proposing that different value to **Transpower** under the **transmission agreement**; and
 - (b) in the case of an application under subclause (2)(b), within 20 **business days** of the **designated transmission customer** reaching an agreement with **Transpower** to which clauses 12.35 to 12.37 apply.
- (4) If **Transpower** or a **designated transmission customer** applies for approval of a different **value of expected unserved energy** under subclause (2)(a), the **Authority** may provisionally approve that value if the **Authority** considers that the value is a reasonable estimate of the **value of expected unserved energy** in respect of the **grid injection point** or **grid exit point** for the **designated transmission customer** concerned.
- (5) If **Transpower** or a **designated transmission customer** applies for approval of a different **value of expected unserved energy** under subclause (2)(b) the **Authority**—
- (a) may approve that value if the **Authority** considers that the value is a reasonable estimate of the **value of expected unserved energy** in respect of the **grid injection point** or **grid exit point** for the **designated transmission customer** concerned; and
 - (b) may decline to approve that value despite having provisionally approved that value under subclause (4).
- (6) If the **Authority** approves the **value of expected unserved energy** proposed by **Transpower** or the **designated transmission customer** under subclause (2)(b), that **value of expected unserved energy** applies for the purposes of applying the **grid reliability standards** under clauses 12.35 to 12.37 for the **grid injection point** or **grid exit point** instead of the **value of expected unserved energy** specified under clause 4 of Schedule 12.2.
- (7) If the **Authority** does not approve the **value of expected unserved energy** proposed by **Transpower** or the **designated transmission customer** under subclause (2)(b), the **value of expected unserved energy** under clause 4 of Schedule 12.2 applies for the purposes of applying the **grid reliability standards** under clauses 12.35 to 12.37 for the **grid injection point** or **grid exit point**.

Compare: Electricity Governance Rules 2003 rule 5.5 section II part F

Clause 12.39 Heading: amended, on 1 February 2016, by clause 48(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 12.39: amended, on 1 February 2016, by clause 48(3) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 12.39(1): revoked, on 1 February 2016, by clause 48(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 12.39(2)(b): amended, on 1 February 2016, by clause 48(4) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 12.39(4): amended, on 1 February 2016, by clause 48(5) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 12.39(6): amended, on 1 February 2016, by clause 48(6) and (7) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 12.39(7): amended, on 1 February 2016, by clause 48(8) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

12.40 Replacement and enhancement of shared connection assets

- (1) If 2 or more **designated transmission customers** are connected to a **point of connection** and **Transpower** has advised those **designated transmission customers**, in accordance with the provisions of a **transmission agreement** between **Transpower** and each of the **designated transmission customers**, that a **grid reliability report published** by **Transpower** in accordance with clause 12.76 sets out that the power system is not reasonably expected to meet the **N-1 criterion** at all times over the next 5 years because of a **connection asset** related to that **point of connection**, **Transpower** must—
 - (a) as soon as practicable after advising the **designated transmission customers**, investigate whether the **connection asset** meets the **grid reliability standards**; and
 - (b) if it finds that the **connection asset** does not meet the **grid reliability standards**, develop proposals for investment in the **grid** to ensure that the **connection asset** meets the **grid reliability standards** and propose them to the **designated transmission customers** as soon as reasonably possible after **publication** of the **grid reliability report**.
- (2) **Transpower** and the **designated transmission customers** advised under subclause (1) must attempt in good faith, within 6 months of the date on which **Transpower** makes its proposals to the **designated transmission customers** under subclause (1)(b), or such longer period as the **Authority** may allow, to reach an agreement for an investment or other solution that will have the effect of—
 - (a) maintaining the level of reliability for the **connection asset** at the level of reliability in the **grid reliability standards**; or
 - (b) increasing or decreasing the level of reliability for the **connection asset** above or below the **grid reliability standards**, so long as **Transpower** and the **designated transmission customers** have complied with clauses 12.35 to 12.37 and 12.39.
- (3) **Transpower** may undertake an investment proposed under subclause (2) only—
 - (a) if the **designated transmission customers** unanimously agree with the proposal in accordance with subclause (2); or
 - (b) if the **designated transmission customers** do not unanimously agree or none of the **designated transmission customers** agree with the proposed investment, if—
 - (i) the proposal has been approved under a grid upgrade plan requested by the Electricity Commission in accordance with rule 5.10 of section II of part F of the **rules** before this Code came into force; or
 - (ii) the proposal is approved by the Commerce Commission under an investment proposal requested by the Commerce Commission in accordance with clause 12.44(1); or
 - (iii) the proposal is permitted under an input methodology determined by the Commerce Commission under section 54S of the Commerce Act 1986.

Compare: Electricity Governance Rules 2003 rule 5.6 section II part F

Clause 12.40(1): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Clause 12.40(1): amended, on 5 October 2017, by clause 296 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 12.40(1) and (2): amended, on 1 November 2018, by clause 76(a) and (b) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2018.

12.41 Removal of shared connection assets from service

- (1) If 2 or more **designated transmission customers** are connected to a **point of connection**, and **Transpower** is required by a **transmission agreement** between **Transpower** and each of those **designated transmission customers** to provide the **connection assets** at the **point of connection**, **Transpower** may **decommission a connection asset** at that **point of connection** from service only—
- (a) if the **designated transmission customers** unanimously agree with the **decommissioning** and clauses 12.35 to 12.37 (if applicable) are complied with; or
 - (b) if the **designated transmission customers** do not unanimously agree, or none of the **designated transmission customers** agree, with the **decommissioning**, if the **decommissioning** results in a net benefit, as calculated under the test set out in clause 12.43.
- (2) To avoid doubt, this clause applies only if **Transpower** proposes to remove a **connection asset** from service and not replace the **asset** with another **connection asset**.

Compare: Electricity Governance Rules 2003 rule 5.7 section II part F

Clause 12.41(1): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Clause 12.41(1): amended, on 5 October 2017, by clause 297 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

12.42 Reconfiguration of shared connection assets

If 2 or more **designated transmission customers** are connected to a **point of connection**, and **Transpower** is required by a **transmission agreement** between **Transpower** and each of those **designated transmission customers** to provide the **connection assets** in the configuration specified in each of those **transmission agreements**, **Transpower** may only change that configuration—

- (a) if the **designated transmission customers** unanimously agree with the reconfiguration and clauses 12.35 to 12.37 (if applicable) are complied with; or
- (b) if the **designated transmission customers** do not unanimously agree, or none of the **designated transmission customers** agree with the reconfiguration, if the reconfiguration results in a net benefit, as calculated under the test set out in clause 12.43.

Compare: Electricity Governance Rules 2003 rule 5.8 section II part F

Clause 12.42: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Clause 12.42: amended, on 5 October 2017, by clause 298 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

12.43 Net benefits test

- (1) When **Transpower** is required to apply a net benefit test, **Transpower** must—
- (a) estimate the following costs:
 - (i) any additional fuel costs incurred by a **generator** in respect of any **generating units** that will be **dispatched** or are likely to be **dispatched** during or after the removal of the **connection asset** or the reconfiguration of the **connection assets**, arising as a result of the removal or reconfiguration:

- (ii) any direct labour and material costs that will be incurred by **Transpower** and the **designated transmission customers** undertaking the removal of the **connection asset** or the reconfiguration of the **connection assets**:
- (iii) any increase in the estimate of **expected unserved energy** in MWh multiplied by the value per MWh of that **expected unserved energy**, arising as a result of the removal of the **connection asset** or the reconfiguration of the **connection assets**:
- (iv) any of the following costs, if the cost is to a person that produces, transmits, retails, or consumes **electricity** in New Zealand:
 - (A) changes in fuel costs of **existing assets, committed projects and modelled projects**:
 - (B) changes in the value of involuntary **demand** curtailment:
 - (C) changes in the costs of **demand**-side management:
 - (D) changes in costs resulting from deferral of capital expenditure on **modelled projects**:
 - (E) changes in costs resulting from differences in the amount of capital expenditure on **modelled projects**:
 - (F) changes in costs resulting from differences in operations and maintenance expenditure on **existing assets, committed projects, and modelled projects**:
 - (G) changes in costs for **ancillary services**:
 - (H) changes in **losses**, including **local losses**:
 - (I) subsidies or other benefits provided under or arising pursuant to all applicable laws, regulations and administrative determinations:
 - (J) the value of the expected change in economic surplus due to a change in competition among **participants** arising as a result of the removal of the **connection asset** or the reconfiguration of the **connection assets**, excluding any expected change in economic surplus due to a change in another cost in this net benefit test:
- (v) any other relevant cost to a person that produces, transmits, retails or consumes **electricity** in New Zealand; and
- (b) estimate the following benefits:
 - (i) any reduction in maintenance costs arising as a result of the removal of the **connection asset** or the reconfiguration of the **connection assets** (including **Transpower's** and any **designated transmission customer's** costs):
 - (ii) any reduction in fuel costs incurred by a **generator** in respect of any **generating units**, arising or likely to arise during or after the removal of the **connection asset** or the reconfiguration of the **connection assets**, as a result of the removal or reconfiguration:
 - (iii) any decrease in the estimate of **expected unserved energy** in MWh multiplied by the value per MWh of that **expected unserved energy**, arising as a result of the removal of the **connection asset** or the reconfiguration of the **connection assets**:
 - (iv) any of the following benefits, if the benefit is to a person that produces,

- transmits, retails or consumes **electricity** in New Zealand:
- (A) changes in fuel costs of **existing assets, committed projects and modelled projects**:
 - (B) changes in the value of involuntary **demand** curtailment:
 - (C) changes in the costs of **demand**-side management:
 - (D) changes in costs resulting from the deferral of capital expenditure on **modelled projects**:
 - (E) changes in costs resulting from differences in the amount of capital expenditure on **modelled projects**:
 - (F) changes in costs resulting from differences in operations and maintenance expenditure on **existing assets, committed projects, and modelled projects**:
 - (G) changes in costs for **ancillary services**:
 - (H) changes in **losses**, including **local losses**:
 - (I) subsidies or other benefits provided under or arising pursuant to all applicable laws, regulations and administrative determinations:
 - (J) the value of the expected change in economic surplus due to a change in competition among **participants** arising as a result of the removal of the **connection asset** or the reconfiguration of the **connection assets**, excluding any expected change in economic surplus due to a change in another benefit in this net benefit test:
- (v) any other relevant benefit to a person that produces, transmits, retails or consumes **electricity** in New Zealand; and
- (c) deduct the costs estimated under paragraph (a) from the benefits estimated under paragraph (b) to determine the net benefit of the proposed removal of the **connection asset** or the reconfiguration of the **connection assets**.
- (2) **Transpower** may apply the test under this clause at differing levels of rigour in different circumstances, which may include taking into account the number of **assets** to be removed or reconfigured, the value of the **assets** involved, and the size of the load served by the **assets**.
- (3) **Transpower** is only required to—
- (a) make a reasonable estimate of the costs and benefits identified in subclause (1), based on information reasonably available to it at the time it undertakes the test, and taking into account the proposed number of **assets** to be removed or reconfigured, the value of the **assets** involved, and the size of the load served by the **assets**; and
 - (b) take account of events that can be reasonably foreseen.
- (4) **Transpower's** estimate of fuel costs under subclause (1) must—
- (a) in relation to thermal **generating stations**, be a reasonable estimate of the fuel costs, based on the economic value of the fuel required for the relevant thermal **generating station**, and justified by **Transpower** with reference to opinions on the economic value of the fuel, provided by 1 or more independent and suitably qualified persons; and
 - (b) in relation to hydroelectric **generating stations**—

- (i) be a reasonable estimate of the fuel costs, based on the economic value of the water stored at a hydroelectric **generating station**, provided by a suitably qualified person other than—
 - (A) **Transpower**; or
 - (B) an employee of **Transpower**; and
 - (ii) be **published**, as provided for in the **Outage Protocol**.
- (5) The direct labour costs of **Transpower** and **designated transmission customers** under subclause (1)(a) may include any amounts paid to contractors, but must not include any apportionment of the overheads or office costs of **Transpower** or **designated transmission customers**.
- (6) The material costs of **Transpower** and **designated transmission customers** under subclause (1)(a) are the costs of the materials used in carrying out the work during the removal of the **connection asset** or the reconfiguration of the **connection assets**.
- (7) In assessing costs and benefits under subclause (1), **Transpower** must consider any reasonably expected operating conditions, forecasts in the **system security forecast**, likely fuel costs, and any other reasonable assumptions.
- (8) The estimate of **expected unserved energy** in MWh multiplied by the value per MWh of that **expected unserved energy** under subclause (1) must be based on—
 - (a) the estimated amount and value of the **expected unserved energy** as agreed between **Transpower** and each affected **designated transmission customer**; or
 - (b) if **Transpower** and a **designated transmission customer** cannot agree on the amount and value of the **expected unserved energy** under paragraph (a), the **value of expected unserved energy** in clause 4 of Schedule 12.2 and **Transpower's** estimate of the **expected unserved energy** in respect of each affected **designated transmission customer** and end use customer.

Compare: Electricity Governance Rules 2003 rule 5.9 section II part F

Clause 12.43: substituted, on 16 December 2013, by clause 5 of the Electricity Industry Participation (Urgent Temporary Grid Reconfiguration) Code Amendment 2013.

Clause 12.43(8)(b): amended, on 1 February 2016, by clause 49 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 12.43(8)(b): amended, on 1 November 2018, by clause 77 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2018.

12.44 Request to the Commerce Commission to request an investment proposal be submitted

- (1) **Transpower** may request in writing that the Commerce Commission request that **Transpower** submit an investment proposal to the Commerce Commission—
 - (a) for the purposes of clause 12.40(3); or
 - (b) if permitted by a **transmission agreement**.
- (2) Unless requested to do so by the Commerce Commission, **Transpower** must not submit an investment proposal to the Commerce Commission for approval in respect of an investment that has been proposed by **Transpower** in accordance with a **transmission agreement** or clause 12.40(3).

Compare: Electricity Governance Rules 2003 rules 5.10 section II, and 12.2.2 section III part F

Resolutions of disputes

12.45 Certain disputes relating to transmission agreements may be referred to Rulings Panel

If a dispute between **Transpower** and a **designated transmission customer** concerning—

- (a) the customer specific terms of a **transmission agreement** being negotiated between those parties; or
- (b) a requested variation of any of the terms of a default **transmission agreement** (other than a variation under clause 12.12) that applies between **Transpower** and the **designated transmission customer** in accordance with clauses 12.10 to 12.13 (including a requested variation from the services described in the default **transmission agreement**); or
- (c) the schedules proposed by **Transpower** under clauses 12.10(2)(b)(v) to (viii) for a default **transmission agreement**; or
- (d) any revision to Schedule 4 or Schedule 5 of a default **transmission agreement** proposed by **Transpower** under clause 12.12; or
- (e) the schedules proposed by **Transpower** under clauses 12.13(1)(b)(v) to (viii) on the expiry or termination of a **transmission agreement**—

is not resolved within a reasonable time, either party may refer the matter to the **Rulings Panel** for determination.

Compare: Electricity Governance Rules 2003 rule 6.1 section II part F

12.46 Rulings Panel has discretion to determine dispute

- (1) The **Rulings Panel** may, in its discretion, decide whether or not to undertake the determination of a dispute under clause 12.45(a) or (b).
- (2) If the **Rulings Panel** decides not to undertake the determination of the dispute, the **Rulings Panel** must inform **Transpower** or the **designated transmission customer**—
 - (a) that the **Rulings Panel** intends to do no more in relation to the matter; and
 - (b) of the reasons for that intention.

Compare: Electricity Governance Rules 2003 rule 6.2 section II part F

12.47 Determinations by Rulings Panel

- (1) In determining a dispute under this clause, the **Rulings Panel** must take into account—
 - (a) the principles for **benchmark agreements** in clause 12.30; and
 - (b) the desirability of consistent treatment of **designated transmission customers** except if special circumstances justify a departure; and
 - (c) the potential impact of a decision on the contents of other **transmission agreements** or existing agreements as described in clauses 12.49 and 12.50.
- (2) The **Rulings Panel** must not determine disputes relating to the interpretation or enforcement of a **transmission agreement** including a **benchmark agreement**.
- (3) The **Rulings Panel** must give notice to the parties of its determination, as soon as reasonably practicable.

Compare: Electricity Governance Rules 2003 rules 6.3 and 6.4 section II part F
Clause 12.47(1)(c): amended, on 16 December 2013, by clause 6 of the Electricity Industry Participation (Revocation of Part 16) Code Amendment 2013.

12.48 Status of default transmission agreement while Rulings Panel determining dispute

Nothing in clauses 12.45 to 12.47 overrides the application of a **benchmark agreement** as a default **transmission agreement** under clause 12.10, pending a determination of the **Rulings Panel**.

Compare: Electricity Governance Rules 2003 rule 6.5 section II part F

Existing agreements not affected

12.49 Existing agreements

- (1) Except as provided for by clause 12.95, this Part does not apply to or affect the rights, powers or obligations of a **participant** or **Transpower** under a written agreement entered into between that **participant** and **Transpower** for connection to and/or use of the **grid** that is—
 - (a) entered into before 29 October 2003; or
 - (b) based on **Transpower's** standard connection contract and entered into before 28 June 2007.
- (2) The exception from this Part in subclause (1) does not apply to a right, power or obligation of a **participant** that arises because of the variation of an agreement described in subclause (1).
- (3) To avoid doubt, the posted terms and conditions of **Transpower** do not constitute a written agreement.

Compare: Electricity Governance Rules 2003 rule 8.1 section II part F

Clause 12.49(1): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Clause 12.49(1): amended, on 5 October 2017, by clause 299 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

12.50 Copies of other agreements to be provided to Authority

- (1) If requested to do so by the **Authority**, **Transpower** or a **participant** must provide a copy of any written agreement for connection to and/or use of the **grid** that **Transpower** or the **participant** is a party to and that was entered into before 28 June 2007.
- (2) The copy that is provided must be—
 - (a) a copy of the complete agreement; and
 - (b) certified by a director or the chief executive of **Transpower** or the **participant**, to the best of the director's or chief executive's knowledge and belief, to be a true and complete copy of the agreement.
- (3) An agreement must be **published** by the **Authority**, unless the parties establish to the satisfaction of the **Authority** that there is good reason for not **publishing** the agreement.

Compare: Electricity Governance Rules 2003 rule 8.2 section II part F

Clause 12.50(1): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Clause 12.50(1): amended, on 5 October 2017, by clause 300 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

12.51 Application to Rio Tinto agreements *[Revoked]*

Compare: Electricity Governance Rules 2003 rule 8.3 section II part F
Clause 12.51: revoked, on 16 December 2013, by clause 7 of the Electricity Industry Participation (Revocation of Part 16) Code Amendment 2013.

Subpart 3— Grid reliability and industry information

12.52 Contents of this subpart

This subpart relates to—

- (a) **grid reliability standards**; and
- (b) **investment contracts**; and
- (c) *[Revoked]*
- (d) grid reliability reporting.

Compare: Electricity Governance Rules 2003 rule 1 section III part F
Clause 12.52(c): revoked, on 1 February 2016, by clause 50 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

12.53 Purpose of the reliability and industry information clauses

The purposes of this subpart are to—

- (a) facilitate **Transpower's** ability to develop and implement long term plans (including timely securing of land access and resource consents) for investment in the **grid**; and
- (b) assist **participants** to identify and evaluate investments in **transmission alternatives**; and
- (c) facilitate efficient investment in generation; and
- (d) facilitate any processes pursuant to Part 4 of the Commerce Act 1986.

Compare: Electricity Governance Rules 2003 rule 2 section III part F

12.54 Obligations to provide information

- (1) Each **participant** must provide information reasonably required by the **Authority** for the purposes of this subpart and respond to requests from the **Authority** under this subpart promptly and accurately.
- (2) Each **participant** must use reasonable endeavours to provide accurate information.
- (3) The **Authority** is not liable for the accuracy of information provided by a **participant**.
- (4) Subject to the Official Information Act 1982, the **Authority** may at its discretion, or on the application of an affected party, withhold **publication** of confidential aspects of the information provided by a **participant** to the **Authority** if the **Authority** reasonably considers that there is good reason for withholding it.

Compare: Electricity Governance Rules 2003 rule 3 section III part F

Grid reliability standards

12.55 Authority determines grid reliability standards

- (1) The **Authority** must determine the most appropriate **grid reliability standards**.
- (2) The **Authority** must consider and determine **grid reliability standards**, having regard to the purposes set out in clause 12.56 and the principles set out in clause 12.57.

- (3) The **grid reliability standards** that apply at the commencement of this Code are the **grid reliability standards** in Schedule 12.2.

Compare: Electricity Governance Rules 2003 rule 4.1 section III part F

12.56 Purpose of grid reliability standards

The purpose of the **grid reliability standards** is to provide a basis for **Transpower** and other parties to appraise opportunities for transmission investments and **transmission alternatives**.

Compare: Electricity Governance Rules 2003 rule 4.2 section III part F

12.57 Principles of grid reliability standards

The **grid reliability standards** should—

- (a) take into account that transmission investments are long-lived assets and require a long-term planning perspective; and
- (b) reflect the public interest in reasonable stability in planning, having regard to the long term nature of investment in transmission assets; and
- (c) be consistent with **good electricity industry practice**; and
- (d) provide flexibility to allow the form of the standards to evolve over time, reflecting any changes in **good electricity industry practice**.

Compare: Electricity Governance Rules 2003 rule 4.3 section III part F

12.58 Content of grid reliability standards

- (1) The **grid reliability standards** must contain 1 or more standards for reliability of the **grid**, which may include without limitation a primary reliability standard and other reliability standards.
- (2) The reliability standards set out in the **grid reliability standards** may differ to reflect differing circumstances in different regions supplied by the **grid**.
- (3) The **grid reliability standards** may include 1 or more standards for reliability of the **core grid**.
- (4) The **grid reliability standards** may contain supporting information, such as information summarising economic assessments balancing different levels of reliability and the expected value of energy at risk.

Compare: Electricity Governance Rules 2003 rule 4.4 section III part F

Review of grid reliability standards

12.59 Interested parties may request review of grid reliability standards

- (1) 1 or more interested parties may request a review by the **Authority** of the **grid reliability standards**. The request must be in the form of a written submission to the **Authority** describing—
 - (a) the nature of the interest of each party seeking the review; and
 - (b) how the review might enable the **grid reliability standards** to better reflect the purpose and principles set out in clauses 12.56 and 12.57
- (2) In addition to receiving written submissions, the **Authority** may elect to hear 1 or more oral submissions.

- (3) The **Authority** must either undertake a review of the **grid reliability standards**, or decline to review the **grid reliability standards** and **publish** reasons for declining.

Compare: Electricity Governance Rules 2003 rule 5.1 section III part F

12.60 Authority review of grid reliability standards

The **Authority** may initiate a review of the **grid reliability standards** for any reason consistent with the statutory objective of the Authority in section 15 of the **Act** and the purpose and principles set out in clauses 12.56 and 12.57.

Compare: Electricity Governance Rules 2003 rule 5.2 section III part F

12.61 Authority must publish draft grid reliability standards

- (1) This clause applies if the **Authority** undertakes a review of the **grid reliability standards** under clauses 12.59 or 12.60.
- (2) The **Authority** must **publish** draft **grid reliability standards**.
- (3) At the time the **Authority** publishes the draft **grid reliability standards** the **Authority** must **publish** the date by which submissions on the draft **grid reliability standards** are to be received by the **Authority**. The date must be no earlier than 15 **business days** from the date of **publication** of the draft **grid reliability standards**.
- (4) Each submission on the draft **grid reliability standards** must be made in writing to the **Authority** and be received on or before the **submission expiry date**. In addition to receiving written submissions, the **Authority** may elect to hear 1 or more oral submissions.

Compare: Electricity Governance Rules 2003 rules 4.5 and 4.6 section III part F

Clause 12.61(3): amended, on 5 October 2017, by clause 301 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

12.62 Decision on grid reliability standards

Within 20 **business days** of the **submission expiry date** (or such longer period as the **Authority** may allow), the **Authority** must complete its consideration of all submissions it receives on the draft **grid reliability standards** and consider whether to include the **grid reliability standards** as a schedule to this Part, in accordance with the **Act**.

Compare: Electricity Governance Rules 2003 rule 4.7 section III part F

Core grid determination

12.63 Authority determines core grid determination

- (1) The **Authority** must determine the most appropriate **core grid determination**.
- (2) The **core grid** specified in the **core grid determination** must include—
- at a minimum, those **assets** that comprise the main elements of the **grid**; and
 - at most, all **assets** that form part of the **grid** and operate at nominal voltages of 66kV and above.
- (3) In determining the most appropriate **core grid determination**, and in a subsequent review of the **core grid determination**, the **Authority** must have regard to—
- the purposes set out in clause 12.64; and
 - the principles set out in clause 12.57 for the **grid reliability standards**; and

- (c) the objectives set out in clause 12.65.
- (4) In determining the most appropriate **core grid determination**, the **Authority** may engage **Transpower** or any other person to assist in the preparation of all or part of the **core grid determination**.
- (5) The **core grid determination** that applies at the commencement of this Code is the **core grid determination** in Schedule 12.3.

Compare: Electricity Governance Rules 2003 rule 5A.1 section III part F

12.64 Purpose of core grid determination

The purpose of the **core grid determination** is to provide a basis for—

- (a) the **Authority** to determine the **grid reliability standards**; and
- (b) **Transpower** and other parties to appraise opportunities for transmission investment and **transmission alternatives**.

Compare: Electricity Governance Rules 2003 rule 5A.2 section III part F

12.65 Objectives of core grid determination

The **Authority** must have regard to the following objectives in determining, and in any subsequent review of, the **core grid determination**:

- (a) avoiding the failure or removal from service of any **asset** forming part of the **core grid**, if the failure or removal from service of that **asset** may result in cascade failure;
- (b) providing flexibility to allow the **core grid** to evolve over time, reflecting any changes in the **grid**;
- (c) reflecting the public interest in reasonable stability in planning for transmission.

Compare: Electricity Governance Rules 2003 rule 5A.3 section III part F

Review of core grid determination

12.66 Interested parties may request review of core grid determination

- (1) 1 or more interested parties may request a review by the **Authority** of the **core grid determination**. The request must be in the form of a written submission to the **Authority** describing—
 - (a) the nature of the interest of each party seeking the review; and
 - (b) how the review might enable the **core grid determination** to better reflect the purpose and objectives set out in clauses 12.64 and 12.65 respectively.
- (2) In addition to receiving written submissions, the **Authority** may elect to hear 1 or more oral submissions.
- (3) The **Authority** must either undertake a review of the **core grid determination**, or decline to review the **core grid determination** and **publish** reasons for declining.

Compare: Electricity Governance Rules 2003 rule 5B.1 section III part F

12.67 Authority review of grid determination

The **Authority** may initiate a review of the **core grid determination** for any reason consistent with the statutory objective of the Authority in section 15 of the **Act** and the purpose and objectives set out in clauses 12.64 and 12.65 respectively.

Compare: Electricity Governance Rules 2003 rule 5B.2 section III part F

12.68 Authority must publish draft core grid determination

- (1) This clause applies if the **Authority** undertakes a review of the **core grid determination** in accordance with clauses 12.66 or 12.67.
- (2) The **Authority** must **publish** a draft **core grid determination**.
- (3) When the **Authority publishes** the draft **core grid determination** the **Authority** must **publish** the date by which submissions on the draft **core grid determination** are to be received by the **Authority**. The date must be no earlier than 15 **business days** from the date of publication of the draft **core grid determination**.
- (4) Each submission on the draft **core grid determination** must be made in writing to the **Authority** and be received on or before the **submission expiry date**. In addition to receiving written submissions, the **Authority** may elect to hear 1 or more oral submissions.

Compare: Electricity Governance Rules 2003 rules 5A.4 and 5A.5 section III part F

Clause 12.68(3): amended, on 5 October 2017, by clause 302 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

12.69 Decision on core grid determination

Within 20 **business days** of the **submission expiry date** (or such longer period as the **Authority** may allow), the **Authority** must complete its consideration of all submissions it receives on the draft **core grid determination** and consider whether to include the **core grid determination** in a schedule to this Part.

Compare: Electricity Governance Rules 2003 rule 5A.6 section III part F

Investment contracts

12.70 Purpose

Clause 12.71 provides for **investment contracts** to be agreed between **designated transmission customers** and **Transpower**, and establishes a process to manage any potential implications for **grid reliability standards**.

Compare: Electricity Governance Rules 2003 rule 8.1 section III part F

12.71 Investment contracts

Transpower may enter into an **investment contract** with implications for **grid reliability standards** only if—

- (a) the **investment contract** is consistent with the **grid reliability standards** or the proposed investment has been approved by the **Authority** under clause 12.36(2), and clause 12.36(2) will apply as if the **investment contract** was a **transmission agreement**; and
- (b) **Transpower** advises the **Authority** of the proposed **investment contract**.

Compare: Electricity Governance Rules 2003 rule 8.2 section III part F

Clause 12.71(b): amended, on 1 November 2018, by clause 78 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2018.

[Revoked]

Cross Heading: revoked, on 1 February 2016, by clause 51(1) of the Electricity Industry Participation Code

Amendment (Code Review Programme) 2015.

12.72 *[Revoked]*

Compare: Electricity Governance Rules 2003 rule 11.1 section III part F
Clause 12.72: revoked, on 1 February 2016, by clause 51(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

12.73 *[Revoked]*

Compare: Electricity Governance Rules 2003 rule 11.2 section III part F
Clause 12.73: revoked, on 1 February 2016, by clause 51(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

12.74 *[Revoked]*

Compare: Electricity Governance Rules 2003 rule 11.3 section III part F
Clause 12.74: revoked, on 1 February 2016, by clause 51(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

12.75 *[Revoked]*

Compare: Electricity Governance Rules 2003 rule 11.4 section III part F
Clause 12.75: revoked, on 1 February 2016, by clause 51(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Grid reliability reporting

12.76 Transpower to publish grid reliability report

- (1) **Transpower** must **publish a grid reliability report** setting out—
 - (a) a forecast of **demand** at each **grid exit point** over the next 10 years; and
 - (b) a forecast of **supply** at each **grid injection point** over the next 10 years; and
 - (c) whether the power system is reasonably expected to meet the **N-1 criterion**, including in particular whether the power system would be in a **secure state** at each **grid exit point**, at all times over the next 10 years; and
 - (d) proposals for addressing any matters identified in accordance with paragraph (c).
- (2) **Transpower** must **publish a grid reliability report** no later than 2 years after the date on which it **published** the previous **grid reliability report**, or such other date as determined by the **Authority** (having consulted with **Transpower**).
- (3) If there is a material change in the forecast **demand** at a **grid exit point** or in the forecast **supply** at a **grid injection point** in the period to which the most recent **grid reliability report** relates, **Transpower** must **publish a revised grid reliability report** as soon as reasonably practicable after the material change.

Compare: Electricity Governance Rules 2003 rule 12A section III part F
Clause 12.76(2): amended, on 21 September 2012, by clause 17 of the Electricity Industry Participation (Minor Amendments) Code Amendment 2012.
Clause 12.76(1): amended, on 5 October 2017, by clause 303 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Subpart 4—Transmission pricing methodology

12.77 Recovery of investment costs by Transpower

The costs incurred by **Transpower** (irrespective of when they are incurred) in relation to an **approved investment** are recoverable by **Transpower** from **designated transmission customers** on the basis of the **transmission pricing methodology** and must be paid by **designated transmission customers** accordingly.

Compare: Electricity Governance Rules 2003 rule 17.1 section III part F

12.78 Purpose for establishing transmission pricing methodology

The purpose of the **transmission pricing methodology** is to ensure that, subject to Part 4 of the Commerce Act 1986, the full economic costs of **Transpower's** services are allocated in accordance with the **Authority's** objective in section 15 of the **Act**.

Compare: Electricity Governance Rules 2003 rule 1 section IV part F

Clause 12.78: amended, on 1 June 2011, by clause 4 of the Electricity Industry Participation (Transmission Pricing) Code Amendment 2011.

12.79 Statutory objective

Transpower, in developing the **transmission pricing methodology**, and the **Authority**, in approving the **transmission pricing methodology**, must assess the **transmission pricing methodology** against the **Authority's** objective in section 15 of the **Act**.

Compare: Electricity Governance Rules 2003 rule 2 section IV part F

Clause 12.79: substituted, on 1 June 2011, by clause 5 of the Electricity Industry Participation (Transmission Pricing) Code Amendment 2011.

12.80 Application and interpretation of pricing principles

[Revoked]

Compare: Electricity Governance Rules 2003 rule 3 section IV part F

Clause 12.80: revoked, on 1 June 2011, by clause 6 of the Electricity Industry Participation (Transmission Pricing) Code Amendment 2011.

12.81 Authority must prepare an issues paper

- (1) The **Authority** must prepare an issues paper on—
 - (a) the process for development and approval of the **transmission pricing methodology**; and
 - (b) the guidelines to be followed by **Transpower** in preparing a methodology for allocating **Transpower's** revenues to **designated transmission customers**.
- (2) The process and guidelines must be developed in accordance with the **Authority's** objective in section 15 of the **Act**.

Compare: Electricity Governance Rules 2003 rule 4 section IV part F

Clause 12.81: substituted, on 1 June 2011, by clause 7 of the Electricity Industry Participation (Transmission Pricing) Code Amendment 2011.

12.82 Authority must consult on issues paper

- (1) When the **Authority publishes** the issues paper, the **Authority** must **publish** of the date by which submissions are to be received by the **Authority**. The date must be no earlier than 15 **business days** from the date of **publication** of the issues paper.

- (2) Each submission on the issues paper must be made in writing to the **Authority** and received on or before the **submission expiry date**. In addition to receiving written submissions, the **Authority** may elect to hear one or more oral submissions.
- (3) Within 20 **business days** of the **submission expiry date** (or such longer period as the **Authority** may allow), the **Authority** must complete its consideration of all submissions it receives on the issues paper.

Compare: Electricity Governance Rules 2003 rule 5 section IV part F
Clause 12.82(1): amended, on 5 October 2017, by clause 304 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

12.83 Authority must publish process and guidelines for development of transmission pricing methodology

After consideration of submissions in clause 12.82(3), the **Authority** must, as soon as reasonably practicable, **publish**—

- (a) the process for the development of the **transmission pricing methodology**; and
- (b) any guidelines that **Transpower** must follow in developing the **transmission pricing methodology**.

Compare: Electricity Governance Rules 2003 rule 6 section IV part F
Clause 12.83: heading amended, on 1 June 2011, by clause 8(1) of the Electricity Industry Participation (Transmission Pricing) Code Amendment 2011.
Clause 12.83(b): amended, on 1 June 2011, by clause 8(2) of the Electricity Industry Participation (Transmission Pricing) Code Amendment 2011.

Development of transmission pricing methodology by Transpower

12.84 A Transmission pricing methodology

The **transmission pricing methodology** that applies at the commencement of this Code is the **transmission pricing methodology** in Schedule 12.4.

Review of an approved transmission pricing methodology

Heading: amended, on 1 June 2011, by clause 9 of the Electricity Industry Participation (Transmission Pricing) Code Amendment 2011.

12.85 Review by Transpower

At any time, **Transpower** may submit to the **Authority** a proposed variation of its **transmission pricing methodology**, provided that the submission is made at least 12 months after the last **Authority** approval of the **transmission pricing methodology**.

Compare: Electricity Governance Rules 2003 rule 11.1 section IV part F

12.86 Review by the Authority

The **Authority** may review an approved **transmission pricing methodology** if it considers that there has been a material change in circumstances.

Compare: Electricity Governance Rules 2003 rule 11.2 section IV part F

12.87 Process for review

A review of the **transmission pricing methodology** must take into account the requirements of clauses 12.79 and 12.89(1). The **Authority** must follow the processes

outlined in clauses 12.91 to 12.94 when reviewing a **transmission pricing methodology**.

Compare: Electricity Governance Rules 2003 rule 11.3 section IV part F

12.88 Transpower to submit methodology

- (1) **Transpower** must submit a proposed **transmission pricing methodology** to the **Authority** within 90 days (or such longer period as the **Authority** may allow) of receipt of a written request from the **Authority**.
- (2) The **Authority** may, after **publishing** the process described in clause 12.83(a) and the guidelines described in clause 12.83(b), issue such a request.

Compare: Electricity Governance Rules 2003 rule 7.1 section IV part F

12.89 Form of proposed transmission pricing methodology

- (1) **Transpower** must develop its proposed **transmission pricing methodology** consistent with—
 - (a) any determination made under Part 4 of the Commerce Act 1986; and
 - (b) the **Authority's** objective in section 15 of the **Act**; and
 - (c) any guidelines **published** under clause 12.83(b).
- (2) **Transpower's** proposed **transmission pricing methodology** must include indicative prices to allow the **Authority** and interested parties to understand the impact of the methodology on **designated transmission customers**.

Compare: Electricity Governance Rules 2003 rule 7.2 section IV part F

Clause 12.89 (1)(b): substituted, on 1 June 2011, by clause 10 of the Electricity Industry Participation (Transmission Pricing) Code Amendment 2011.

12.90 Authority may decline to consider proposed transmission pricing methodology

- (1) The **Authority** may decline to consider the proposed **Transpower transmission pricing methodology** if, in the **Authority's** view, **Transpower** has not provided sufficient information for the **Authority** to make an informed assessment of the matters referred to in clauses 12.91 to 12.94.
- (2) If the **Authority** so declines, the **Authority** must advise **Transpower** of the extra information required, and **Transpower** must provide a revised **transmission pricing methodology** by a date specified by the **Authority**.

Compare: Electricity Governance Rules 2003 rule 7.3 section IV part F

Process for determination of transmission pricing methodology

12.91 Authority may approve proposed transmission pricing methodology or refer back to Transpower

- (1) After consideration of **Transpower's** proposed **transmission pricing methodology**, the **Authority** may either—
 - (a) approve the proposed **transmission pricing methodology** having regard to the requirements of clause 12.89(1); or
 - (b) refer the proposed **transmission pricing methodology** back to **Transpower** if in the **Authority's** view the proposed **transmission pricing methodology** does not adequately conform to the requirements of clause 12.89(1) and **Transpower** will

have 20 **business days** to consider the **Authority's** concerns and to resubmit its proposed **transmission pricing methodology** for consideration by the **Authority**.

- (2) If the **Authority** considers that the **transmission pricing methodology** resubmitted by **Transpower** under subclause (1)(b) does not conform to the requirements of clause 12.89(1), the **Authority** may make any amendments it considers necessary to ensure that the proposed **transmission pricing methodology** adequately conforms to the requirements of clause 12.89(1).

Compare: Electricity Governance Rules 2003 rule 8.1 section IV part F

12.92 Authority must publish proposed transmission pricing methodology

- (1) The **Authority** must **publish** the proposed **transmission pricing methodology** as soon as practicable.
- (2) At the time the **Authority publishes** the proposed **transmission pricing methodology** the **Authority** must **publish** the date by which submissions are to be received by the **Authority**. The date must be no earlier than 15 **business days** from the date of **publication** of the proposed **transmission pricing methodology**.
- (3) Each submission on the proposed **transmission pricing methodology** must be made in writing to the **Authority** and received on or before the **submission expiry date**. In addition to receiving written submissions, the **Authority** may elect to hear 1 or more oral submissions.

Compare: Electricity Governance Rules 2003 rules 8.2 and 8.3 section IV part F

Clause 12.92(2): amended, on 5 October 2017, by clause 305 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

12.93 Decision on transmission pricing methodology

Within 40 **business days** of the **submission expiry date** (or such longer period as the **Authority** may allow), the **Authority** must complete its consideration of all submissions it receives on a proposed **transmission pricing methodology** and consider whether to include the **transmission pricing methodology** in a schedule to this Part and, if so, the date that the **transmission pricing methodology** will take effect.

Compare: Electricity Governance Rules 2003 rule 8.4 section IV part F

12.94 Authority to determine commencement date

In determining a date on which the **transmission pricing methodology** must take effect, the **Authority** must consult with **Transpower**.

Compare: Electricity Governance Rules 2003 rule 8.5 section IV part F

Application of approved transmission pricing methodology

12.95 Charges to comply with approved transmission methodology

- (1) Except for the **input connection contracts, new investment agreement contracts, and notional embedding contracts**, **Transpower** must charge for those transmission services affected only in accordance with the approved **transmission pricing methodology**.
- (2) *[Revoked]*

Compare: Electricity Governance Rules 2003 rule 9.1 section IV part F

Clause 12.95(1): amended, on 16 December 2013, by clause 8(1) of the Electricity Industry Participation (Revocation of Part 16) Code Amendment 2013.

Clause 12.95(2): revoked, on 16 December 2013, by clause 8(2) of the Electricity Industry Participation (Revocation of Part 16) Code Amendment 2013.

12.96 Development of transmission prices

After approval of the **transmission pricing methodology**, **Transpower** must—

- (a) develop and **publish** transmission prices consistent with the **transmission pricing methodology** based on its total revenue requirement for connection to or use of the **grid**; and
- (b) demonstrate to the **Authority** that the prices are consistent with the **transmission pricing methodology**.

Compare: Electricity Governance Rules 2003 rule 9.2 section IV part F

Clause 12.96(a): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Clause 12.96(a): amended, on 5 October 2017, by clause 306 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Audit of transmission prices

12.97 Audit of transmission prices

- (1) The **Authority** may appoint an **auditor** to confirm whether **Transpower's** transmission prices have been calculated in accordance with the **transmission pricing methodology**.
- (2) **Transpower** must ensure that the **auditor's** report includes the **auditor's** view on whether the application of the **transmission pricing methodology** by **Transpower** contains errors or inconsistencies that may have a material impact on the prices of any individual **designated transmission customers**, or **designated transmission customers** in general.
- (3) **Transpower** must provide the **auditor** with all relevant information required by the **auditor** to complete its review.

Compare: Electricity Governance Rules 2003 rule 9.3 section IV part F

Clause 12.97(2): amended, on 1 February 2016, by clause 52 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

12.98 Transpower may respond to auditor's report

Transpower must ensure that the **auditor's** report includes any comments that **Transpower** provided to the **auditor** within 15 **business days** of **Transpower** receiving a draft of the report.

Compare: Electricity Governance Rules 2003 rule 9.4 section IV part F

Clause 12.98: substituted, on 1 February 2016, by clause 53 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

12.99 Final auditor report to the Authority

- (1) **Transpower** must ensure that, within 10 **business days** after the **auditor** receives **Transpower's** response under clause 12.98, the **auditor** provides a report to the **Authority** certifying that either—
 - (a) **Transpower** had applied correctly the approved **transmission pricing methodology**; or

- (b) material errors remained in **Transpower's** application of the **transmission pricing methodology**.
- (2) Within 5 **business days** of receiving the report, the **Authority** must **publish** the **auditor's** report.

Compare: Electricity Governance Rules 2003 rules 9.5 and 9.6 section IV part F
Clause 12.99(1): amended, on 1 February 2016, by clause 54 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

12.100 Transpower to redetermine transmission prices

If the **auditor** concludes that there are material errors in **Transpower's** application of the **transmission pricing methodology**, **Transpower** must recalculate and **publish** revised transmission prices to correct identified errors.

Compare: Electricity Governance Rules 2003 rule 9.7 section IV part F

12.101 Auditor's costs

Transpower must meet the actual and reasonable expenses of the **auditor**.

Compare: Electricity Governance Rules 2003 rule 9.8 section IV part F

12.102 Enforcement of transmission charges

- (1) The approved **transmission pricing methodology** must be incorporated in **transmission agreements** between **Transpower** and **designated transmission customers**.
- (2) The amount payable by a **designated transmission customer** under a **transmission agreement** under subclause (1)—
- (a) is recoverable in any court of competent jurisdiction as a debt due to **Transpower**; and
 - (b) may be challenged in any proceedings to recover the debt on the ground that **Transpower** has incorrectly applied the **transmission pricing methodology** in a manner that is adverse to the **designated transmission customer** but the **transmission pricing methodology** itself may not be challenged.

Compare: Electricity Governance Rules 2003 rule 10 section IV part F

Subpart 5—Financial transmission rights *[Revoked]*

Subpart 5: revoked, on 1 October 2011, by clause 6 of the Electricity Industry Participation (Financial Transmission Rights) Code Amendment 2011.

12.103 Contents of this subpart

[Revoked]

Compare: Electricity Governance Rules 2003 rule 1 section V part F
Clause 12.103: revoked, on 1 October 2011, by clause 6 of the Electricity Industry Participation (Financial Transmission Rights) Code Amendment 2011.

12.104 Design

[Revoked]

Compare: Electricity Governance Rules 2003 rule 2 section V part F
Clause 12.104: revoked, on 1 October 2011, by clause 6 of the Electricity Industry Participation (Financial Transmission Rights) Code Amendment 2011.

Subpart 6—Interconnection asset services

12.105 Purpose of this subpart

The purpose of this subpart is to—

- (a) create incentives on **Transpower**, through enforceable service measures, to provide **interconnection assets** at the capacity ratings required by **designated transmission customers** and other **grid** users; and
- (b) ensure that **Transpower** provides information on the capacity of **interconnection assets**, and their reliability and availability, to enable **grid** users to monitor the capacity and performance of **interconnection assets**; and
- (c) establish processes for the identification of investments in the **grid**, and alternatives to such investments, to ensure efficient decision-making on the use of and upgrades to the **grid**; and
- (d) specify the circumstances in which **Transpower** may permanently or temporarily remove **interconnection assets** from service or reconfigure the **grid**.

Compare: Electricity Governance Rules 2003 rule 1 section VI part F

Clause 12.105(d): amended, from 2 March 2012 to 3 December 2012, by clause 4 of the Electricity Industry Participation (Temporary Grid Reconfiguration) Code Amendment 2012.

Clause 12.105(d): amended, from 15 March 2013 to 15 December 2013, by clause 4 of the Electricity Industry Participation (Temporary Grid Reconfiguration) Code Amendment 2013.

Clause 12.105(d): amended, 16 December 2013, by clause 6 of the Electricity Industry Participation (Urgent Temporary Grid Reconfiguration) Code Amendment 2013.

12.106 Interconnection asset capacity and grid configuration

- (1) The interconnection asset capacity and grid configuration set out in schedule F6 of section VI of part F of the **rules** immediately before this Code came into force, continues in force and is deemed to be the interconnection asset capacity and grid configuration that applies at the commencement of this Code.
- (2) Clause 12.110 applies to the interconnection asset capacity and grid configuration.

12.107 Transpower to identify interconnection branches, and propose service measures and levels

- (1) **Transpower** must provide the **Authority** with the information set out in subclause (4) and a diagram showing the configuration of the **grid**, other than **connection assets**.
- (2) **Transpower** must provide the information and diagram referred to in subclause (1) to the **Authority** in the form specified by the **Authority**.
- (3) The interconnection asset capacity and grid configuration referred to in subclause (1) must be provided within 3 months of the date on which the **Authority**, in accordance with subclause (2), sets the form in which the interconnection asset capacity and grid configuration must be provided.
- (4) The information required under subclause (1) is—
 - (a) for each **interconnection circuit branch**, the following service measures and service levels:
 - (i) the overall continuous capacity rating of the **interconnection circuit branch**, for both summer and winter periods in MVA and amperes:
 - (ii) the level of impedance of the interconnection **circuit branch** both **resistive**

- and **reactive** and for **assets** arranged in both **shunt** and **series** in PU, using a base of 100 MVA, provided the impedance of the **interconnection circuit branch** is equal to or more than 0.0001 PU, using 100 MVA as the base:
- (iii) the nominal high voltage rating of each interconnection **circuit branch** in kV:
 - (iv) the high voltage range that each **interconnection circuit branch** can be operated over in kV, specified as a maximum and a minimum; and
- (b) for each **interconnection transformer branch**, the following information:
- (i) the overall 24 hour post contingency capacity rating of the **interconnection transformer branch**, for both the summer and winter period, in amperes and MVA as follows:
 - (A) for 2 Winding **interconnection transformer branches**, the overall 24 hour post contingency capacity rating:
 - (B) for 3 Winding **interconnection transformer branches**, the overall 24 hour post contingency capacity rating, at HV, MV, and LV:
 - (ii) the continuous capacity rating of the **interconnection transformer branch** in amperes and MVA as follows:
 - (A) for 2 Winding **interconnection transformer branches**, the continuous capacity rating:
 - (B) for 3 Winding **interconnection transformer branches**, the continuous capacity rating, at HV, MV, and LV:
 - (iii) the level of impedance of the **interconnection transformer branch**, both **resistive** and **reactive** and for **assets** arranged in both **shunt** and in **series** in PU, using a base of 100 MVA, as follows:
 - (A) for 2 Winding **interconnection transformer branches**, the level of impedance of the **interconnection transformer branch**:
 - (B) for 3 Winding **interconnection transformer branches**, the level of impedance of the **interconnection transformer branch**, at HV, MV, and LV:
 - (iv) the nominal high voltage rating of the interconnection **transformer branch** in kV:
 - (v) the high voltage range that the interconnection **transformer branch** can be operated over in kV, specified as a maximum, and a minimum:
 - (vi) in respect of the tapping steps and ranges of the **interconnection transformer branch**:
 - (A) the tap voltage range in volts, specified as a maximum and a minimum:
 - (B) the **number** of tapping steps:
 - (C) the size of each tapping step as a percentage of the operational voltage range:
 - (D) whether the tapping step is on-load or off-load:
 - (E) whether on-load tapping capacity is automatic or manual;
 - (F) if on-load tapping capacity is automatic, whether it is auto-selected:
 - (G) if on-load tapping capacity is manual, the tap step it is normally set to,

- which for the purposes of this clause is the actual or expected position at winter peak demand; and
- (c) the **transfer** capacity in the North and South transfer for each **configuration** of the **HVDC link** expressed as follows:
 - (i) DC sent in **MW**;
 - (ii) AC received in **MW**; and
 - (d) for each **shunt asset**, the following service measures and service levels:
 - (i) the overall capacity rating, in **MVAr**, in terms of both absorption or provision;
 - (ii) the nominal voltage rating of the **shunt asset** in **kV**;
 - (iii) the maximum and minimum voltage range in **kV** that the **shunt asset** can operate over; and
 - (e) in addition to the information required under paragraph (d) in relation to **shunt assets**:
 - (i) whether each **shunt asset** is dynamic or static;
 - (ii) if the **shunt asset** is dynamic, whether it is an **SVC** or synchronous compensator;
 - (iii) any **shunt assets** that may directly affect the capacity of the **HVDC link** as set out in paragraph (c) and the likely magnitude of such effect; and
 - (f) the dates for the summer and winter periods or other such defined periods as may apply for the purposes of paragraphs (a) and (b).
- (5) The information provided under subclause (4) must,—
- (a) in the case of information provided under subclause (4)(a), (c) and (d), be consistent with the information disclosed by **Transpower** in the most recent **asset capability statement** provided by **Transpower** under clause 2(5) of **Technical Code A** of Schedule 8.3; and
 - (b) in the case of information provided under subclause (4)(b), be consistent with the **manufacturer's specification** for the component **assets** and the information disclosed by **Transpower** in the most recent **asset capability statement** provided under clause 2(5) of **Technical Code A** of Schedule 8.3, if this differs from the **manufacturer's specifications**;
 - (c) in the case of information provided under subclause (4)(a), be consistent with the thermal design rating of each **interconnection branch**; and
 - (d) cover every **interconnection asset**, either as part of an **interconnection circuit branch**, **interconnection transformer branch**, the **HVDC link** or as a **shunt asset**.
- (6) After reviewing the interconnection asset capacity and grid configuration provided under subclause (1), the **Authority** may request **Transpower** to reconsider whether any of the interconnection asset capacity and grid configuration, is accurate, and require **Transpower** to resubmit the interconnection asset capacity and grid configuration to the **Authority** for reconsideration.

Compare: Electricity Governance Rules 2003 rules 2.1 to 2.6 section VI part F
Clause 12.107(2): replaced, on 5 October 2017, by clause 307(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.
Clause 12.107(4): amended, on 5 October 2017, by clause 307(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 12.107(5): amended, on 5 October 2017, by clause 307(3) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

12.108 Consultation on proposed interconnection asset capacity and grid configuration

- (1) If the **Authority** is provisionally satisfied that the interconnection asset capacity and grid configuration provided under clause 12.107(1) or resubmitted under clause 12.107(6) are correct, the **Authority** must **publish** the proposed interconnection asset capacity and grid configuration as soon as practicable for consultation with any person that the **Authority** thinks is likely to be materially affected by the incorporation of the proposed interconnection asset capacity and grid configuration by reference in this Code.
- (2) As well as the consultation required under subclause (1), the **Authority** may undertake any other consultation it considers necessary.

Compare: Electricity Governance Rules 2003 rules 2.7 and 2.8 section VI part F

12.109 Decision on interconnection asset capacity and grid configuration

- (1) When the **Authority** has completed its consultation on the proposed interconnection asset capacity and grid configuration, it must consider whether to incorporate the proposed interconnection asset capacity and grid configuration by reference in this Code.
- (2) If the **Authority** decides to incorporate the interconnection asset capacity and grid configuration by reference in this Code, the **Authority** must determine a date on which the incorporation by reference takes effect and comply with Schedule 1 of the **Act** in relation to it.

Compare: Electricity Governance Rules 2003 rule 2.9 section VI part F

12.110 Incorporation of interconnection asset capacity and grid configuration by reference

- (1) The interconnection asset capacity and grid configuration is incorporated by reference in this Code in accordance with section 32 of the **Act**.
- (2) Subclause (1) is subject to Schedule 1 of the **Act**, which includes a requirement that the **Authority** must give notice in the *Gazette* before an amended or substituted interconnection asset capacity and grid configuration becomes incorporated by reference in this Code.

Clause 12.110(1): amended, on 5 October 2017, by clause 308 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

12.111 Transpower to make interconnection branches and other assets available and keep grid configuration

- (1) **Transpower** must make each **interconnection circuit branch**, **interconnection transformer branch**, the **HVDC link**, and each **shunt asset** identified in the interconnection asset capacity and grid configuration available for use by the **system operator** for the conveyance of **electricity**—
 - (a) at least at the service levels specified in the interconnection asset capacity and grid configuration in accordance with clause 12.107(4); and
 - (b) in accordance with **good electricity industry practice** and relevant health and

safety standards.

- (2) **Transpower** must keep the **grid** in the configuration set out in the interconnection asset capacity and grid configuration.
- (3) **Transpower** is not required to comply with subclauses (1)(a) or (2) if clause 12.112(1) applies.

Compare: Electricity Governance Rules 2003 rule 3 section VI part F

12.112 Exceptions to clause 12.111

- (1) **Transpower** is not required to comply with clause 12.111(1)(a) or (2) if—
 - (a) permitted under the **Outage Protocol** made under subpart 7; or
 - (b) an **interconnection asset** that forms part of an interconnection **branch** or the **HVDC link**, or a **shunt asset**—
 - (i) is permanently removed from service, the **grid** is permanently reconfigured, or the transmission capacity of such an **asset** is reduced, and the decision to remove the **asset** from service or reconfigure the **grid** or reduce the transmission capacity of the **asset** takes into account the effect of the removal of the **asset**, reconfiguration of the **grid**, or the reduction in transmission capacity of the **asset**, on other materially affected parties, and is undertaken—
 - (A) in order to maintain the health and safety of any person; or
 - (B) in order to maintain the safety and integrity of equipment; or
 - (C) in accordance with demonstrably prudent economic criteria; or
 - (iaa) has been temporarily removed from service, or the **grid** has been temporarily reconfigured, in accordance with clause 12.116AA; or
 - (ia) *[Expired]*
 - (ii) has been permanently removed from service, or the **grid** has been permanently reconfigured, in accordance with clause 12.117; or
 - (c) a modification to an **interconnection branch**, the **HVDC link**, a **shunt asset** or to the configuration of the **grid**, has been made as a result of an investment in the **grid**; or
 - (d) a modification to an **interconnection branch**, the **HVDC link**, a **shunt asset** or to the configuration of the **grid** has been made as a result of an investment made under an **investment contract** entered into in accordance with clauses 12.70 and 12.71; or
 - (e) the voltage range specified in the **AOPOs** for an **interconnection asset** that forms part of an **interconnection branch** is modified, or any **equivalence arrangement** is approved or **dispensation** is granted under clauses 8.29 to 8.31 in respect of the **asset**; or
 - (ea) in relation to the **HVDC link**—
 - (i) the **HVDC owner** is operating the **HVDC link** in accordance with—
 - (A) a **commissioning** plan agreed with the **system operator** under clause 2(6) to (9) of **Technical Code A** of Schedule 8.3; or
 - (B) a test plan provided to the **system operator** under clause 2(6) to (9) of **Technical Code A** of Schedule 8.3; and

- (ii) the **configuration** of the **HVDC link** is—
 - (A) Pole 3 and Pole 2 bipole **round power**; or
 - (B) Pole 3 and Pole 2 bipole not **round power**; or
 - (f) **Transpower** and a **designated transmission customer** have agreed otherwise in accordance with clause 12.128.
- (2) If subclause (1)(c) to (e) applies, or the **grid** is reconfigured under subclause (1)(b)(i) or (ii), **Transpower** must—
 - (a) make the **interconnection branch**, the **HVDC link** or the **shunt asset** available to the **system operator** at least at its modified capacity rating, and at its modified service levels; and
 - (b) keep the **grid** in its modified configuration.
- (2AA) Subclause (2AB) applies—
 - (a) if subclause (1)(b)(iaa) applies; and
 - (b) while—
 - (i) an **interconnection asset** that forms part of an **interconnection branch** or the **HVDC link**, or a **shunt asset**, has been temporarily removed; or
 - (ii) the **grid** has been temporarily reconfigured.
- (2AB) **Transpower** must make the **interconnection branch**, the **HVDC link** or the **shunt asset** available to the **system operator** at least at its modified capacity rating, and at its modified service levels.
- (2A) *[Expired]*
- (2B) *[Expired]*
- (3) If a decision to remove an **asset**, or reconfigure the **grid**, or reduce the transmission capacity of an **asset** has been made under subclause (1)(b)(i) or (ii), **Transpower** must as soon as reasonably possible **publish** the analysis it undertook in accordance with subclause (1)(b)(i) or (ii), or a summary of that analysis.

Compare: Electricity Governance Rules 2003 rule 4 section VI part F
Clause 12.112(1)(b): amended, from 2 March 2012 to 3 December 2012, by clause 5(1) of the Electricity Industry Participation (Temporary Grid Reconfiguration) Code Amendment 2012.
Clause 12.112(1)(b)(i): amended, from 15 March 2013 to 15 December 2013, by clause 5(1)(a) of the Electricity Industry Participation (Temporary Grid Reconfiguration) Code Amendment 2013.
Clause 12.112(1)(b)(i): amended, on 16 December 2013, by clause 7(1) of the Electricity Industry Participation (Urgent Temporary Grid Reconfiguration) Code Amendment 2013.
Clause 12.112(1)(b)(iaa): inserted, from 15 March 2013 to 15 December 2013, by clause 5(1)(b) of the Electricity Industry Participation (Temporary Grid Reconfiguration) Code Amendment 2013.
Clause 12.112(1)(b)(iaa): inserted, on 16 December 2013, by clause 7(2) of the Electricity Industry Participation (Urgent Temporary Grid Reconfiguration) Code Amendment 2013.
Clause 12.112(1)(b)(ii): amended, from 15 March 2013 to 15 December 2013, by clause 5(1)(c) of the Electricity Industry Participation (Temporary Grid Reconfiguration) Code Amendment 2013.
Clause 12.112(1)(b)(ii): amended, on 16 December 2013, by clause 7(3) of the Electricity Industry Participation (Urgent Temporary Grid Reconfiguration) Code Amendment 2013.
Clause 12.112(1)(ea): inserted, on 26 September 2013, by clause 4 of the Electricity Industry Participation (HVDC Link Bipole Control System Testing) Code Amendment 2013.
Clause 12.112(1)(ea)(i)(A): amended, on 5 October 2017, by clause 309(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.
Clause 12.112(2): amended, from 2 March 2012 to 3 December 2012, by clause 5(2) of the Electricity Industry Participation (Temporary Grid Reconfiguration) Code Amendment 2012.
Clause 12.112(2): amended, from 15 March 2013 to 15 December 2013, by clause 5(2) of the Electricity Industry Participation (Temporary Grid Reconfiguration) Code Amendment 2013.
Clause 12.112(2): amended, on 16 December 2013, by clause 7(4) of the Electricity Industry Participation (Urgent Temporary Grid Reconfiguration) Code Amendment 2013.
Clause 12.112(2): amended, on 5 October 2017, by clause 309(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 12.112(2AA) and (2AB): inserted, from 15 March 2013 to 15 December 2013, by clause 5(3) of the Electricity Industry Participation (Temporary Grid Reconfiguration) Code Amendment 2013.

Clause 12.112(2AA) and (2AB): inserted, on 16 December 2013, by clause 7(5) of the Electricity Industry Participation (Urgent Temporary Grid Reconfiguration) Code Amendment 2013.

Clause 12.112(2A) and (2B): inserted, from 2 March 2012 to 3 December 2012, by clause 5(3) of the Electricity Industry Participation (Temporary Grid Reconfiguration) Code Amendment 2012.

Clause 12.112(3): amended, from 15 March 2013 to 15 December 2013, by clause 5(4) of the Electricity Industry Participation (Temporary Grid Reconfiguration) Code Amendment 2013.

Clause 12.112(3): amended, on 16 December 2013, by clause 7(6) of the Electricity Industry Participation (Urgent Temporary Grid Reconfiguration) Code Amendment 2013.

Clause 12.112(3): amended, on 5 October 2017, by clause 309(3) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

12.113 Transpower to maintain interconnection assets

Transpower must design, construct, maintain and operate all **interconnection assets** in accordance with **good electricity industry practice**.

Compare: Electricity Governance Rules 2003 rule 5 section VI part F

Transpower to propose investments

12.114 Investments to meet the grid reliability standards

- (1) If a **grid reliability report** identifies, in accordance with clause 12.76(1)(c), that the power system is not reasonably expected to meet the **N-1 criterion** at a **grid exit point** at all times over the 5 years following the date on which the report is **published** and that this is due to an **interconnection asset**, **Transpower** must—
 - (a) as soon as practicable, investigate whether the **interconnection asset** meets the **grid reliability standards**; and
 - (b) if the **interconnection asset** does not **meet** the **grid reliability standards**, consider reasonably practicable options for ensuring that the **grid reliability standards** can be met in respect of that asset; and
 - (c) if **Transpower** considers that 1 or more investments are required in respect of that **interconnection asset** in order to meet the **grid reliability standards**, submit an investment proposal to the Commerce Commission—
 - (i) in sufficient time to avoid a breach of the **grid reliability standards**; or
 - (ii) if the **grid reliability standards** have already been breached, within 6 months, or such longer period as the **Authority** may allow, after the publication of the **grid reliability report** that sets out the investment or investments that **Transpower** proposes to make; and
 - (d) if it considers that an investment is not necessary, **publish** the reasons for this and any alternative measures that **Transpower** proposes to undertake.
- (2) If an investment proposal submitted under this clause is approved by the Commerce Commission under section 54R of the Commerce Act 1986 or permitted under an input methodology determined under section 54S of that Act, **Transpower** must undertake the investment—
 - (a) before the **grid** falls below the **grid reliability standards** for the reason referred to in subclause (1); or
 - (b) if the **grid** had already fallen below the **grid reliability standards**, or if it is not reasonably practicable to undertake the investment as provided in paragraph (a), as

soon as reasonably practicable.

- (3) **Transpower** does not need to submit an investment proposal under subclause (1)(c) if the investment to which the proposal relates has previously been included in an investment proposal submitted to, and considered—
- (a) before this Code came into force, by the Electricity Commission under section III of part F of the **rules**; or
 - (b) after this Code came into force, by the Commerce Commission under section 54R or section 54S of the Commerce Act 1986.

Compare: Electricity Governance Rules 2003 rule 6.1 section VI part F

12.115 Other investments

- (1) **Transpower** must publish a **grid economic investment report** on whether there are investments that it considers, other than the investments identified under clause 12.114, could be made in respect of the **interconnection assets**.
- (2) **Transpower** must publish a **grid economic investment report** no later than 2 years after the date on which it published the previous **grid economic investment report**, or such other date as determined by the **Authority**.
- (3) If a **grid economic investment report** identifies that there are investments that could be made, **Transpower** must **publish** within 6 months a report setting out a proposed timetable for **Transpower** to consider whether to submit 1 or more investment proposals to the Commerce Commission in respect of those possible investments.
- (4) The **grid economic investment report** does not need to report on possible investments that have been previously included in an investment proposal submitted to, and considered,—
 - (a) before this Code came into force, by the Electricity Commission under section III of part F of the **rules**; or
 - (b) after this Code came into force, by the Commerce Commission under section 54R or section 54S of Part 4 of the Commerce Act 1986.

Compare: Electricity Governance Rules 2003 rule 6.2 section VI part F

12.116 Information on capacities of individual interconnection assets

- (1) **Transpower** must **publish** the following information in respect of each **interconnection asset**:
 - (a) for each transformer that is an **interconnection asset**, the overall 24 hour post contingency capacity rating of the **asset** in amperes and MVA, for both the summer and winter periods:
 - (b) for all other **interconnection assets**, the overall capacity rating of the **asset** in amperes and MVA and, if the **interconnection assets** are circuits, for both the summer and winter periods.
- (2) The information required under subclause (1)—
 - (a) must be consistent with the **manufacturer's specification** for the **asset** or with the most recent **asset capability statement** provided by **Transpower** under clause 2(5) of **Technical Code A** of Schedule 8.3, if this differs from the **manufacturer's specification**; and
 - (b) must be in a form that allows the **branch** to which each **asset** belongs to be easily

identified; and

- (c) must be **published** in the form determined by the **Authority** as soon as reasonably practicable after the **Authority** has determined the form.

Compare: Electricity Governance Rules 2003 rule 7 section VI part F

Clause 12.116(1): amended, on 5 October 2017, by clause 310(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 12.116(2)(b): amended, on 5 October 2017, by clause 310(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 12.116(2)(c): substituted, on 1 February 2016, by clause 55 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

12.116AA Temporary removal of interconnection assets from service or temporary grid reconfiguration

- (1) **Transpower** must temporarily remove 1 or more **interconnection assets** from service, or temporarily reconfigure the **grid** as permitted under clause 12.112(1)(b)(iaa), if—
- (a) the removal or reconfiguration is requested by the **system operator** in accordance with clause 9.13B; and
- (b) the removal or reconfiguration will result in a net benefit, as calculated under the test set out in clause 12.117.
- (2) If **Transpower** temporarily removes **interconnection assets** from service or temporarily reconfigures the **grid** in response to a notice given under clause 9.13B, **Transpower** must, as soon as is reasonably practicable after the circumstances specified in that notice cease to exist—
- (a) restore the **interconnection assets** to service; or
- (b) restore the **grid** to its original configuration.

Clause 12.116AA: inserted, from 15 March 2013 to 15 December 2013, by clause 6 of the Electricity Industry Participation (Temporary Grid Reconfiguration) Code Amendment 2013.

Clause 12.116AA: inserted, on 16 December 2013, by clause 8 of the Electricity Industry Participation (Urgent Temporary Grid Reconfiguration) Code Amendment 2013.

Clause 12.116AA(1): amended, on 5 October 2017, by clause 311 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

12.116AB *[Expired]*

Clause 12.116AB: inserted, from 15 March 2013 to 15 December 2013, by clause 6 of the Electricity Industry Participation (Temporary Grid Reconfiguration) Code Amendment 2013.

12.116AC Information to be published

If **Transpower** receives a notice given in accordance with clause 9.13B, **Transpower** must **publish**,—

- (a) as soon as practical, a copy of the notice; and
- (b) by no later than 5 **business days** after receiving the notice, a summary of **Transpower's** application of the net benefit test that relates to the exceptional circumstances stated in the notice.

Clause 12.116AC Heading: amended, on 5 October 2017, by clause 312(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 12.116AC: inserted, from 15 March 2013 to 15 December 2013, by clause 6 of the Electricity Industry Participation (Temporary Grid Reconfiguration) Code Amendment 2013.

Clause 12.116AC: inserted, on 16 December 2013, by clause 8 of the Electricity Industry Participation (Urgent Temporary Grid Reconfiguration) Code Amendment 2013.

Clause 12.116AC: amended, on 5 October 2017, by clause 312(2) of the Electricity Industry Participation Code

Amendment (Code Review Programme) 2017.

12.116A [*Expired*]

Clause 12.116A: inserted, from 2 March 2012 to 3 December 2012, by clause 6 of the Electricity Industry Participation (Temporary Grid Reconfiguration) Code Amendment 2012.

12.116B [*Expired*]

Clause 12.116B: inserted, from 2 March 2012 to 3 December 2012, by clause 6 of the Electricity Industry Participation (Temporary Grid Reconfiguration) Code Amendment 2012.

12.116C [*Expired*]

Clause 12.116C: inserted, from 2 March 2012 to 3 December 2012, by clause 6 of the Electricity Industry Participation (Temporary Grid Reconfiguration) Code Amendment 2012.

12.117 Permanent removal of interconnection assets from service or permanent grid reconfiguration

- (1) **Transpower** may permanently remove **interconnection assets** from service or permanently reconfigure the **grid** as permitted under clause 12.112(1)(b) only if removal of the **asset** or reconfiguration of the **grid** results in a net benefit, as calculated under the test set out in subclause (2).
- (2) When **Transpower** is required to apply a net benefit test, **Transpower** must—
 - (a) estimate the following costs:
 - (i) any additional fuel costs incurred by a **generator** in respect of any **generating units** that will be **dispatched** or are likely to be **dispatched** during or after the removal of the **interconnection asset** or the reconfiguration of the **grid**, arising as a result of the removal or reconfiguration:
 - (ii) any direct labour and material costs that will be incurred by **Transpower** and the **designated transmission customers** undertaking the removal of the **interconnection asset** or the reconfiguration of the **grid**:
 - (iii) any increase in the estimate of **expected unserved energy** in MWh multiplied by the value per MWh of that **expected unserved energy**, arising as a result of the removal of the **interconnection asset** or the reconfiguration of the **grid**:
 - (iv) any relevant cost specified in clause 12.43(1)(a)(iv):
 - (v) any other relevant cost to a person that produces, transmits, retails or consumes **electricity** in New Zealand; and
 - (b) estimate the following benefits:
 - (i) any reduction in maintenance costs arising as a result of the removal of the **interconnection asset** or the reconfiguration of the **grid** (including **Transpower's** and any **designated transmission customer's** costs):
 - (ii) any reduction in fuel costs incurred by a **generator** in respect of any **generating units**, arising or likely to arise during or after the removal

- of the **interconnection asset** or the reconfiguration of the **grid**, as a result of the removal or reconfiguration:
- (iii) any decrease in the estimate of **expected unserved energy** in MWh multiplied by the value per MWh of that **expected unserved energy**, arising as a result of the removal of the **interconnection asset** or the reconfiguration of the **grid**;
 - (iv) any relevant benefit specified in clause 12.43(1)(b)(iv);
 - (v) any other relevant benefit to a person that produces, transmits, retails or consumes **electricity** in New Zealand; and
- (c) deduct the costs estimated under paragraph (a) from the benefits estimated under paragraph (b) to determine the net benefit of the proposed removal of the **interconnection asset** or the reconfiguration of the **grid**.
- (3) **Transpower** may apply the test under this clause at differing levels of rigour in different circumstances, which may include taking into account the number of **assets** to be removed or reconfigured, the value of the **assets** involved, and the size of the load served by the **assets**.
- (4) **Transpower** is only required to—
- (a) make a reasonable estimate of the costs and benefits identified in subclause (2), based on information reasonably available to it at the time it undertakes the test, and taking into account the proposed number of **assets** to be removed or reconfigured, the value of the **assets** involved, and the size of the load served by the **assets**; and
 - (b) take account of events that can be reasonably foreseen.
- (5) **Transpower's** estimate of fuel costs under subclause (2) must—
- (a) in relation to thermal **generating stations**, be a reasonable estimate of the fuel costs, based on the economic value of the fuel required for the relevant thermal **generating station**, and justified by **Transpower** with reference to opinions on the economic value of the fuel, provided by 1 or more independent and suitably qualified persons; and
 - (b) in relation to hydroelectric **generating stations**—
 - (i) be a reasonable estimate of the fuel costs, based on the economic value of the water stored at a hydroelectric **generating station**, provided by a suitably qualified person other than—
 - (A) **Transpower**; or
 - (B) an employee of **Transpower**; and
 - (ii) be **published**, as provided for in the **Outage Protocol**.
- (6) The direct labour costs of **Transpower** and **designated transmission customers** under subclause (2)(a) may include any amounts paid to contractors, but must not include any apportionment of the overheads or office costs of **Transpower** or **designated transmission customers**.
- (7) The material costs of **Transpower** and **designated transmission customers** under subclause (2)(a) are the costs of the materials used in carrying out the work during the removal of the **interconnection asset** or the reconfiguration of the **grid**.

- (8) In assessing the costs and benefits under subclause (2), **Transpower** must consider any reasonably expected operating conditions, forecasts in the **system security forecast**, likely fuel costs, and any other reasonable assumptions.
- (9) The estimate of **expected unserved energy** in MWh multiplied by the value per MWh of that **expected unserved energy** under subclause (2) must be based on the **value of expected unserved energy** in clause 4 of Schedule 12.2 and **Transpower's** estimate of the **expected unserved energy** in respect of each affected **designated transmission customer** and end use customer.
- (10) To avoid doubt, this clause applies to the removal of **interconnection assets** from service if **Transpower** does not propose to replace those **assets** with another **asset**.

Compare: Electricity Governance Rules 2003 rule 8 section VI part F

Clause 12.117 Heading: amended, on 5 October 2017, by clause 313(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 12.117: substituted, on 16 December 2013, by clause 9 of the Electricity Industry Participation (Urgent Temporary Grid Reconfiguration) Code Amendment 2013.

Clause 12.117(1): amended, from 2 March 2012 to 3 December 2012, by clause 7 of the Electricity Industry Participation (Temporary Grid Reconfiguration) Code Amendment 2012.

Clause 12.117(1): amended, from 15 March 2013 to 15 December 2013, by clause 7 of the Electricity Industry Participation (Temporary Grid Reconfiguration) Code Amendment 2013.

Clause 12.117(1): amended, on 5 October 2017, by clause 313(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 12.117(9): amended, on 1 February 2016, by clause 56 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 12.117(9): amended, on 1 November 2018, by clause 79 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2018.

12.118 Transpower to provide and publish annual report on interconnection asset capacity and grid configuration

- (1) **Transpower** must provide the **Authority** with and **publish** an annual report including—
 - (a) any matter required to be reported on for the purposes of this clause by the **Outage Protocol**; and
 - (b) the extent to which, in the preceding year ending 30 June, it has complied with the requirements of clause 12.111(1)(a) and (2); and
 - (c) any specific instances in which **Transpower** has not complied with clause 12.111(1)(a) and (2); and
 - (d) to the extent practicable, the circumstances that have given rise to any failure to comply with clause 12.111(1)(a) and (2); and
 - (e) to the extent practicable, any steps that it intends to take or other options to reduce the likelihood of failing to comply with clause 12.111(1)(a) and (2) in the future; and
 - (f) any modifications made to **interconnection circuit branches**, the **HVDC link**, and each **shunt asset** under clause 12.112(c) to (e) in the preceding year ending 30 June and the extent to which it has complied with clause 12.112(2) in respect of those modifications, including any specific instances in which **Transpower** has not complied; and
 - (g) any **interconnection assets** that have been removed from service, or any reconfigurations to the **grid** made, in accordance with clause 12.116AA or clause

- 12.117; and
- (h) copies of any agreements made under clause 12.128 or, in respect of **interconnection assets** only, clause 12.151 in the preceding year ending 30 June; and
 - (i) an update of the interconnection asset capacity and grid configuration required under clause 12.107(1), as at the end of the preceding year ending 30 June.
- (2) **Transpower** must provide to the **Authority** and **publish**, the report referred to in subclause (1) by 30 November each year.
- (3) The **Authority** may incorporate by reference in this Code the updated interconnection asset capacity and grid configuration referred to in subclause (1)(i) in accordance with clause 12.110. The **Authority** may consult with any person the **Authority** considers is likely to be materially affected by the proposed amendments to the interconnection asset capacity and grid configuration, as it sees fit. **Transpower** must comply with the interconnection asset capacity and grid configuration incorporated by reference in this Code in accordance with clause 12.110.

Compare: Electricity Governance Rules 2003 rule 9 section VI part F

Clause 12.118(1)(g): amended, from 2 March 2012 to 3 December 2012, by clause 8 of the Electricity Industry Participation (Temporary Grid Reconfiguration) Code Amendment 2012.

Clause 12.118(1)(g): amended, from 15 March 2013 to 15 December 2013, by clause 8 of the Electricity Industry Participation (Temporary Grid Reconfiguration) Code Amendment 2013.

Clause 12.118(1)(g): amended, on 16 December 2013, by clause 10 of the Electricity Industry Participation (Urgent Temporary Grid Reconfiguration) Code Amendment 2013.

Clause 12.118(1): amended, on 5 October 2017, by clause 314(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 12.118(2): amended, on 5 October 2017, by clause 314(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Reporting on availability and reliability

12.119 Index measures for availability and reliability

The index measures for availability and reliability for each **interconnection branch**, **shunt asset** and the **HVDC link** are the index measures for reliability for each **interconnection branch**, **shunt asset** and the **HVDC link** in Schedule 12.5.

12.120 Updating of availability and reliability index measures

- (1) This clause applies if **interconnection assets**—
 - (a) are modified or replaced as permitted under clause 12.112(1); or
 - (b) have been damaged or degraded but, after conducting the investigation required under clause 12.114(1), **Transpower** considers that they still meet the **grid reliability standards**.
- (2) If this clause applies, if, after the availability and the reliability or availability index measures for an **interconnection branch**, **shunt asset** and the **HVDC link** or aggregated **interconnection branches** or **shunt assets** no longer meet the requirements of clause 12.122, the availability and reliability index measures in Schedule 12.5 must be updated following the procedure specified in clauses 12.121 to 12.127.
- (3) **Transpower** must propose the revised index measures under clause 12.121 within 20 **business days** of the modification or replacement, or such longer period as the **Authority** may allow.

Compare: Electricity Governance Rules 2003 rule 10.9 section VI part F

12.121 Transpower to submit draft index measures for availability and reliability

- (1) **Transpower** must provide the **Authority** with proposed index measures for availability and reliability for each **interconnection branch**, **shunt asset** and the **HVDC link**, in accordance with this clause.
- (2) For the purposes of subclause (1), **Transpower** must categorise **interconnection branches** and **shunt assets** into groups of **interconnection branches** and **shunt assets** comprising similar **assets**.
- (3) The index measures to be provided under subclause (1) are—
 - (a) annual unavailability of each **interconnection branch**, **shunt asset** and the **HVDC link** due to **planned outages** of 1 minute or longer in hours per year ending 30 June, expressed as a percentage; and
 - (b) annual unavailability of each **interconnection branch**, **shunt asset** and the **HVDC link** due to **unplanned outages** of 1 minute or longer in hours per year ending 30 June, expressed as a percentage; and
 - (c) annual number of **planned interruptions** of 1 minute or longer caused by **planned outages** of 1 minute or longer of each **interconnection branch**, **shunt asset** and the **HVDC link**; and
 - (d) annual number of **unplanned interruptions** of 1 minute or longer caused by **unplanned outages** of 1 minute or longer of each **interconnection branch**, **shunt asset** and the **HVDC link**;
 - (e) total unserved energy per year ending 30 June in **MWh** resulting from **planned interruptions** of 1 minute or longer caused by **planned outages** of 1 minute or longer of each **interconnection branch**, **shunt asset** and the **HVDC link**; and
 - (f) total unserved energy per year ending 30 June in **MWh** resulting from **unplanned interruptions** of 1 minute or longer caused by **unplanned outages** of 1 minute or longer of each **interconnection branch**, **shunt asset** and the **HVDC link**.
- (4) At the same time, **Transpower** must propose availability and reliability index measures for aggregated **interconnection branches** and **shunt assets**, such as by **asset** class or for all of the **grid**.

Compare: Electricity Governance Rules 2003 rule 10.1 section VI part F

Clause 12.121(2): amended, on 5 October 2017, by clause 315(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 12.121(3): amended, on 5 October 2017, by clause 315(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

12.122 Requirements for index measures

- (1) The proposed availability and reliability index measures under clause 12.121(3) must be based on the average annual availability and reliability of each category of **interconnection branch**, or **shunt asset** and of the **HVDC link** over the 5 year period (ending 30 June) immediately before this clause came into force.
- (2) The proposed index measures under clause 12.121(3) must be accompanied by an explanation showing how the requirements of subclause (1) were applied.
- (3) The index measure for unserved energy under clause 12.121(3)(e) and (f) must be determined in accordance with the methodology for determining **expected unserved**

- energy** relating to **outages** of **interconnection assets** specified in the **Outage Protocol**.
- (4) In proposing the availability and reliability index measures under clause 12.121(4), **Transpower** must specify its reasons for proposing those measures.

Compare: Electricity Governance Rules 2003 rule 10.2 section VI part F

Clause 12.122(1): amended, on 5 October 2017, by clause 316 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

12.123 Authority may initially approve proposed index measures or refer back to Transpower

After considering **Transpower's** proposed availability and reliability index measures and accompanying reasons the **Authority** may either—

- (a) provisionally approve the proposed availability and reliability index measures; or
- (b) refer the proposed availability and reliability index measures and accompanying explanation back to **Transpower** if in the **Authority's** view—
 - (i) the proposed availability and reliability index measures under clause 12.121 are not consistent with the requirements of clause 12.122(1) or the methodology referred to in clause 12.122(3); or
 - (ii) the proposed availability and reliability index measures under clause 12.121 do not provide sufficient information to meet the reasonable needs of **grid** users; or
 - (iii) the reasons provided with the availability and reliability targets in accordance with clause 12.122 are inadequate—

and **Transpower** must within **20 business days** (or such longer period as the **Authority** may allow) consider the **Authority's** concerns and resubmit the proposed availability and reliability index measures and accompanying explanations for consideration by the **Authority**.

Compare: Electricity Governance Rules 2003 rule 10.3 section VI part F

12.124 Amendment of proposed index measures by the Authority

If the **Authority** considers that the availability and reliability index measures resubmitted by **Transpower** under clause 12.123(b) are not consistent with the requirements of clause 12.122(1) or the methodology referred to in clause 12.122(3), or do not provide relevant information to **grid** users, the **Authority** may make any amendments to the index measures it considers necessary.

Compare: Electricity Governance Rules 2003 rule 10.4 section VI part F

12.125 Authority must consult on proposed index measures

- (1) The **Authority** must **publish** the proposed availability and reliability index measures, either as provisionally approved by the **Authority** or as amended by the **Authority**, as soon as is practicable, for consultation with any person that the **Authority** thinks is likely to be materially affected by the proposed index measures.
- (2) As well as the consultation required under subclause (1), the **Authority** may undertake any other consultation it considers necessary.

Compare: Electricity Governance Rules 2003 rules 10.5 and 10.6 section VI part F

12.126 Decision on index measures

When the **Authority** has completed its consultation on the proposed availability and reliability measures it must consider whether to include the index measures as a schedule to this Part.

Compare: Electricity Governance Rules 2003 rule 10.7 section VI part F

12.127 Transpower to report on availability and reliability

- (1) By 30 November in each year, **Transpower** must **publish** and provide to the **Authority** information on availability and reliability of **interconnection assets** including—
 - (a) annual unavailability of each **interconnection branch, shunt asset** and the **HVDC link** due to **planned outages** of 1 minute or longer in the preceding year ending 30 June in hours per year expressed as a percentage; and
 - (b) annual unavailability of each **interconnection branch, shunt asset** and the **HVDC link** due to **unplanned outages** of 1 minute or longer in the preceding year ending 30 June in hours per year, expressed as a percentage; and
 - (c) annual number of **planned interruptions** of 1 minute or longer caused by **planned outages** of one minute or longer of each **interconnection branch, shunt asset** and the **HVDC link** in the preceding year ending 30 June; and
 - (d) annual number of **unplanned interruptions** of 1 minute or longer caused by **unplanned outages** of 1 minute or longer of each **interconnection branch, shunt asset** and the **HVDC link** in the preceding year ending 30 June; and
 - (e) total unserved energy in the preceding year ending 30 June resulting from **planned interruptions** of 1 minute or longer caused by **planned outages** of 1 minute or longer of **interconnection branches, shunt assets** and the **HVDC link**; and
 - (f) total unserved energy in the preceding year ending 30 June resulting from **unplanned interruptions** of 1 minute or longer caused by **unplanned outages** of 1 minute or longer of **interconnection branches, shunt assets** and the **HVDC link**; and
 - (g) annual number of **outages** of each **interconnection branch, shunt asset** and the **HVDC link** that are shorter than 1 minute in the preceding year ending 30 June; and
 - (h) the annual number of **interruptions** shorter than 1 minute caused by **outages** that are shorter than 1 minute of each **interconnection branch, shunt asset** and the **HVDC link**, in the preceding year ending 30 June; and
 - (i) a comparison of the information required by paragraphs (a) to (f) against the availability and reliability index measures for **interconnection branches, shunt assets** and the **HVDC link** included in a schedule to this Part under clause 12.126;
 - (j) to the extent practicable, an explanation of the reasons for not meeting the reliability and availability index measures for **interconnection branches, shunt assets** and the **HVDC link** included in a schedule to this Part under clause 12.126 and any steps or other options it intends to take in future to meet the index measures; and

- (k) information on its performance against the reliability and availability index measures for aggregated **interconnection branches** included in a schedule to this Part under clause 12.126.
- (2) The information **published** under subclause (1) must be specified in the same units of measurement as the corresponding index measures included in a schedule to this Part under clause 12.126.
- (3) **Transpower** does not breach this Code by reason of a failure to meet the index measures included in a schedule to this Part under clause 12.126.
Compare: Electricity Governance Rules 2003 rule 10.8 section VI part F
Clause 12.127(1): amended, on 5 October 2017, by clause 317 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

12.128 Transpower and designated transmission customers may agree on other requirements

- (1) **Transpower** and each **designated transmission customer** must comply with this Part, unless agreed otherwise by **Transpower** and the **designated transmission customer** in respect of specified **interconnection circuit branches**, the **HVDC link**, **shunt assets** or **interconnection assets**, or the **designated transmission customer** in accordance with subclause (2).
- (2) An agreement between **Transpower** and a **designated transmission customer** under this clause must not exclude the application of subclause (3)(b) and must be conditional in all respects on—
 - (a) obtaining agreement from all other potentially affected **designated transmission customers** that this Part does not apply to the specified **interconnection circuit branches**, the **HVDC link**, **shunt assets** or **interconnection assets**, or the **designated transmission customer**; and
 - (b) **Transpower** and the **designated transmission customer** confirming in writing to the **Authority** that they have consulted with all potentially affected end use customers on this Part not applying to the specified **interconnection branches**, **circuit branches**, the **HVDC link**, **shunt assets** or **interconnection assets** or the **designated transmission customer**, and that there are no material unresolved issues affecting the interests of those end use customers.
- (3) **Transpower** must—
 - (a) give written notice to the **Authority** as soon as practicable if **Transpower** enters into an agreement with a **designated transmission customer** under this clause; and
 - (b) **publish** the agreement no later than 20 **business days** after entering into the agreement.

Compare: Electricity Governance Rules 2003 rule 11 section VI part F
Clause 12.128(2): amended, on 5 October 2017, by clause 318(a) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.
Clause 12.128(3): replaced, on 5 October 2017, by clause 318(b) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Subpart 7—Preparation of Outage Protocol

12.129 Purpose of this subpart

The purpose of this subpart is to provide for the making of an **Outage Protocol**, with input from **Transpower** and in consultation with other interested parties, that—

- (a) specifies the circumstances in which **Transpower** may temporarily remove any **assets** forming part of the **grid** from service or reduce the capacity of assets to efficiently manage the operation of the **grid**; and
- (b) specifies procedures and policies for **Transpower** to plan for **outages** and for carrying out such **outages** to—
 - (i) ensure **Transpower** involves **designated transmission customers** in making decisions on **planned outages** as much as possible; and
 - (ii) ensure coordination between **Transpower** and **designated transmission customers**; and
 - (iii) enable **Transpower** to efficiently manage the operation of the **grid**; and
- (c) specifies procedures and policies for dealing with **unplanned outages** of the **grid**.

Compare: Electricity Governance Rules 2003 rule 1 section VII part F

12.130 Definition of outage

- (1) An **outage** exists when **interconnection assets** or **connection assets** are temporarily not provided in accordance with—
 - (a) the requirements of a **transmission agreement**; or
 - (b) the requirements of subpart 6.
- (2) Without limiting subclause (1), an **outage** includes any situation in which—
 - (a) **Transpower** removes **assets** from service temporarily; or
 - (b) **assets** are not able to be provided due to **grid emergencies**, in order to deal with health and safety issues, or due to circumstances beyond **Transpower's** reasonable control; or
 - (c) **Transpower** reduces the capacity of **branches** below the capacity required by a **transmission agreement** or clause 12.111; or
 - (d) **Transpower** changes the configuration of the **grid**; or
 - (e) **Transpower** is required by law to carry out an **outage**.

Compare: Electricity Governance Rules 2003 rule 2 section VII part F

12.131 Outage Protocol

- (1) The **Outage Protocol** set out in schedule F7 of section VII of part F of the **rules** immediately before this Code came into force, continues in force and is deemed to be the **Outage Protocol** that applies at the commencement of this Code, with the following amendments:
 - (a) every reference to the Board must be read as a reference to the **Authority**;
 - (b) every reference to the **rules** must be read as a reference to the Code;
 - (c) every reference to a provision of the **rules** must be read as a reference to the corresponding provision of the Code;

- (d) the reference in clause 3.1.2(d), clause 3.3.5(c), and clause 3.3.8(a) to a reliability investment or an economic investment approved by the Board must be read as a reference to an **approved investment**;
 - (e) the reference in clause 10.2.1(a) and (b) to the **benchmark agreement** in schedule F2 must be read as a reference to the **benchmark agreement** incorporated by reference into this Code under clause 12.34;
 - (f) the reference in clauses A1.1(a)(ii), A7.2(a)(ii), and A7.2(b)(i) to the value of unserved energy in clause 8.3.4 of schedule F4 of section III must be read as a reference to the **value of expected unserved energy** in clause 4 of Schedule 12.2;
 - (g) the reference in clauses A6.1(f) and A6.2(e) to the matters specified in clauses 27.1 to 27.9 of schedule F4 of section III must be read as the matters specified in clause 12.43(1)(a)(iv) and (b)(iv);
 - (h) the reference in clause A8.1(a)(i) to fuel costs specified in the statement of opportunities must be read as a reference to fuel costs calculated in accordance with clause 12.141(3)(a)(i).
- (2) The **Authority** must as soon as practicable after this Code comes into force, publish a version of the **Outage Protocol** in which the provisions of this Code that correspond to the provisions of the **rules** referred to in the **Outage Protocol** are shown.
- (3) Clause 12.150 applies to the **Outage Protocol**.

Review of Outage Protocol

12.132 Review of Outage Protocol

The **Authority** may review the **Outage Protocol** at any time, in accordance with the requirements of clauses 12.133 and 12.145 to 12.149.

Compare: Electricity Governance Rules 2003 rule 14 section VII part F

12.133 Transpower to submit proposed Outage Protocol

- (1) **Transpower** must submit a proposed **Outage Protocol** to the **Authority** within 3 months (or such longer period as the **Authority** may allow) of receipt of a written request from the **Authority**. The **Authority** may issue such a request at any time.
- (2) The proposed **Outage Protocol** must give effect to or promote the principles set out in clause 12.134 and provide for the matters set out in clauses 12.135 to 12.144.
- (3) With its proposed **Outage Protocol**, **Transpower** must submit to the **Authority** an explanation of the proposed **Outage Protocol** and a **statement of proposal** for the proposed **Outage Protocol**.

Compare: Electricity Governance Rules 2003 rule 8 section VII part F

Principles and required content of Outage Protocol

12.134 Principles for developing Outage Protocol

The **Outage Protocol** must give effect to the following principles:

- (a) the matters in clause 12.129;
- (b) the need for a fair and reasonable balance of interests between the **grid owner** and **designated transmission customers**;

- (c) the need to ensure that the **grid owner** can meet all obligations placed on it by the **system operator** for the purpose of meeting common security and power quality requirements under Part 8 of this Code;
- (d) the need to ensure that the safety of all personnel is maintained;
- (e) the need to ensure that the safety and integrity of equipment is maintained;
- (f) the desirability of the **Outage Protocol** and Part 8 operating in an integrated and consistent manner, if possible.

Compare: Electricity Governance Rules 2003 rule 3 section VII part F

12.135 Required content of Outage Protocol

- (1) The **Outage Protocol** must—
 - (a) require **Transpower** to plan for **outages**, other than **outages** that are not reasonably foreseeable, in accordance with clause 12.136; and
 - (b) require **Transpower** and **designated transmission customers** to act reasonably and in good faith in planning for **outages**, in accordance with clause 12.137; and
 - (c) set out the situations and times at which **Transpower** must reconsider the timing of proposed **planned outages**, as specified in clause 12.138; and
 - (d) permit **Transpower** to vary a proposed **planned outage**, as specified in clause 12.139;
 - (e) set out the requirements for **Transpower** to consider when planning for **outages**, in order to give effect to the net benefit principle, as specified in clause 12.140; and
 - (f) permit **Transpower** to undertake **outages** in order to give effect to an **approved investment**, and to undertake **outages** that are required by the Electricity Act 1992, as specified in clause 12.142; and
 - (g) permit **Transpower** to undertake **outages**, or take such other steps, as the **system operator** may reasonably require.
- (2) The **Outage Protocol** must require **Transpower** to set out the procedures and policies for dealing with **unplanned outages**, as specified in clause 12.143.
- (3) The **Outage Protocol** must require **Transpower** to report on compliance with the **Outage Protocol**, in accordance with clause 12.144.
- (4) The **Outage Protocol** must set out—
 - (a) processes for **Transpower** to consult with **designated transmission customers** and to determine an **outage plan** setting out **planned outages** for each year ending 30 June, and processes for the **outage plan** to be updated; and
 - (b) requirements on **Transpower** to keep **designated transmission customers** informed about **planned outages**, including minimum notice periods for **Transpower** to advise affected **designated transmission customers** of **planned outages** not set out in the **outage plan**; and
 - (c) procedures for **outage** co-ordination by **Transpower** and between **Transpower** and **designated transmission customers**; and
 - (d) requirements on **Transpower** to provide information to **designated transmission customers** about **unplanned outages**.

- (5) The **Outage Protocol** is not limited to the matters referred to in this clause, and may provide for any other matters related to **outages**.

Compare: Electricity Governance Rules 2003 rule 4 section VII part F
Clause 12.135(4)(a): amended, on 5 October 2017, by clause 319 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

12.136 Planning for outages

The **Outage Protocol** must require **Transpower** to plan for **outages**, other than **outages** that are not reasonably foreseeable—

- (a) in respect of **interconnection assets**, in accordance with the requirements of the **Outage Protocol** specified under clause 12.140(1); and
- (b) in respect of **connection assets**, by agreeing with each affected **designated transmission customer** on the timing and duration of the **outage** or, failing agreement, in accordance with the requirements of the **Outage Protocol** specified under clause 12.140(1); and
- (c) in respect of outages of both **interconnection assets** and **connection assets** that are required in order to give effect to an **approved investment** or are required by the Electricity Act 1992, in accordance with the requirements of the **Outage Protocol** specified under clause 12.142.

Compare: Electricity Governance Rules 2003 rule 5.1 section VII part F

12.137 Transpower and designated transmission customers to act reasonably and in good faith

- (1) The **Outage Protocol** must require **Transpower**, in planning for **outages** in accordance with clauses 12.136, 12.140, and 12.142, reconsidering the timing of proposed **planned outages** in accordance with clause 12.138 or varying proposed **planned outages** in accordance with clause 12.139, to act reasonably and in good faith, taking into account the information reasonably known at the time or that can be reasonably forecast.
- (2) The **Outage Protocol** must require **designated transmission customers**, in exercising rights or undertaking obligations under the **Outage Protocol**, to act reasonably and in good faith.

Compare: Electricity Governance Rules 2003 rule 5.2 section VII part F

12.138 Reconsideration of planned outages

The **Outage Protocol** must set out the situations and the times at which **Transpower** must reconsider the timing of proposed **planned outages**, and the extent to which the proposed timing of **planned outages** needs to be reconsidered, which may include—

- (a) whenever material new information has been provided to **Transpower** about the likely effect of a proposed **planned outage**; and
- (b) whenever circumstances relating to a proposed **planned outage** have changed sufficiently to justify reconsideration of the requirements specified under clauses 12.140 or 12.142, and **Transpower** is aware or has been made aware of the change in circumstances.

Compare: Electricity Governance Rules 2003 rule 5.3 section VII part F

12.139 Variations to planned outages

- (1) The **Outage Protocol** may permit **Transpower** to vary a proposed **planned outage** only if—
 - (a) in respect of a proposed **planned outage** of **interconnection assets**, the variation of the proposed **planned outage** is permitted in accordance with the requirements of the **Outage Protocol** specified under clauses 12.140 or 12.142; or
 - (b) in respect of a proposed **planned outage** of **connection assets**, **Transpower** and each affected **designated transmission customer** agree on the variation as provided for in the **Outage Protocol** or, failing agreement, the variation of the proposed **planned outage** is permitted in accordance with the requirements of the **Outage Protocol** specified under clauses 12.140 or 12.142; or
 - (c) the variation is necessary as a result of a **grid emergency**, in order to deal with health and safety issues, in order to comply with the **Act** or due to other circumstances beyond **Transpower's** reasonable control; or
 - (d) the variation is required to meet a request of the **system operator** that **Transpower** vary a proposed **planned outage**.
- (2) The **Outage Protocol** must require **Transpower**, if possible, to give notice of a variation before the proposed **planned outage**, and if prior notice is not possible, to advise of the variation to the proposed **planned outage** as soon as possible after the variation occurs.

Compare: Electricity Governance Rules 2003 rule 5.4 section VII part F

12.140 Net benefit principle, requirements and methodologies

- (1) The requirements of the **Outage Protocol** relating to planning for **outages** under clause 12.136(a) or (b), or for varying proposed **planned outages** under clause 12.139(1)(a) or (b)—
 - (a) must give effect to the net benefit principle specified in subclause (2), in determining the timing and duration of a **planned outage**, and whether to undertake a **planned outage**, either by including the particular requirements set out in clause 12.141(2), or by some other means; and
 - (b) may include methodologies and processes for **Transpower** to apply when planning for **outages**; and
 - (c) may include other requirements that may apply in different situations.
- (2) The net benefit principle is that, in planning and varying a **planned outage**, **Transpower** must ensure that the **planned outage** is likely to result in net benefits to persons who produce, transmit, distribute, retail or consume **electricity**—
 - (a) in respect of **interconnection assets**, to the extent those persons are affected by an **outage**; and
 - (b) in respect of **connection assets**, if **Transpower** has not agreed the timing and duration of the **outage** with the relevant **designated transmission customer** in accordance with the **Outage Protocol**, to the extent those persons are affected by an **outage**.

Compare: Electricity Governance Rules 2003 rule 5.5 section VII part F

12.141 Consideration of the likely effects of planned outages

- (1) The **Outage Protocol** may require **Transpower** to determine the likely effect of a proposed **planned outage** on the power system, **generators** and **consumers**, and—
 - (a) if a proposed **outage** is not reasonably expected to—
 - (i) result in the power system failing to meet the **grid reliability standards**; and/or
 - (ii) give rise to **binding constraints**; and/or
 - (iii) result in loss of supply to **consumers**,
may permit **Transpower** to undertake the **outage**; and
 - (b) if a proposed **outage** is likely to result in, or give rise to, the matters referred to in paragraph (a), the **Outage Protocol** may require **Transpower** to comply with the particular requirements specified in subclause (2).
- (2) The requirements in subclause (1) that the **Outage Protocol** may provide are—
 - (a) if a proposed **planned outage** is likely to result in the power system failing to meet the **grid reliability standards**, but is not expected to give rise to **binding constraints** or result in loss of **supply** to **consumers**, **Transpower** must—
 - (i) estimate the following costs:
 - (A) any direct labour and material costs that **Transpower** will incur in undertaking the **outage**;
 - (B) any direct labour and material costs that **designated transmission customers** will incur as a result of **Transpower** undertaking the **outage**;
 - (C) if the **outage** will result in an increased risk of loss of **supply**, any increase in the estimate of **expected unserved energy** in MWh multiplied by the value per MWh of that **expected unserved energy**;
 - (D) any relevant cost specified in clause 12.43(1)(a)(iv);
 - (E) any other relevant cost to a person that produces, transmits, retails or consumes **electricity** in New Zealand; and
 - (ii) estimate the following benefits:
 - (A) if the **outage** will result in a decreased risk of loss of **supply**, any decrease in the estimate of **expected unserved energy** in MWh multiplied by the value per MWh of that **expected unserved energy**;
 - (B) any reduction in maintenance costs arising as a result of the **outage** (including **Transpower's** and any **designated transmission customer's** costs);
 - (C) any relevant benefit specified in clause 12.43(1)(b)(iv);
 - (D) any other relevant benefit to a person that produces, transmits, retails or consumes **electricity** in New Zealand; and
 - (iii) carry out the **outage** only if the costs estimated under subparagraph (i) are less than the benefits estimated under subparagraph (ii); and
 - (b) if a proposed **planned outage** is likely to give rise to **binding constraints**, whether or not the **outage** is also likely to result in a loss of **supply** to **consumers**, **Transpower** must—

- (i) estimate the following costs:
 - (A) any direct labour and material costs that **Transpower** will incur in undertaking the **outage**:
 - (B) any direct labour and material costs that **designated transmission customers** will incur as a result of **Transpower** undertaking the **outage**:
 - (C) if the **outage** will result in an increased risk of loss of **supply**, any increase in the estimate of **expected unserved energy** in MWh multiplied by the value per MWh of that **expected unserved energy**:
 - (D) any additional fuel costs incurred by a **generator** in respect of any **generating units** that will be **dispatched** or are likely to be **dispatched** during or after the **outage** and as a result of the **outage**:
 - (E) any relevant cost specified in clause 12.43(1)(a)(iv):
 - (F) any other relevant costs to a person that produces, transmits, retails or consumes **electricity** in New Zealand; and
 - (ii) estimate the following benefits:
 - (A) any reduction in maintenance costs resulting from the **outage** (including **Transpower's** and any **designated transmission customer's** costs):
 - (B) any reduction in fuel costs incurred by a **generator** in respect of any **generating units**, arising or likely to arise during or after the **outage** and as a result of the **outage**:
 - (BA) if the **outage** will result in a decreased risk of loss of **supply**, any decrease in the estimate of **expected unserved energy** in MWh multiplied by the value per MWh of that **expected unserved energy**:
 - (C) any relevant benefit specified in clause 12.43(1)(b)(iv):
 - (D) any other relevant benefit to a person that produces, transmits, retails or consumes **electricity** in New Zealand; and
 - (iii) carry out the **outage** only if the costs estimated under subparagraph (i) are less than the benefits estimated under subparagraph (ii); and
- (c) if a proposed planned **outage** is likely to lead to loss of **supply** to **consumers**, whether or not the **outage** is also likely to give rise to **binding constraints**, **Transpower** must—
- (i) estimate the following costs:
 - (A) any direct labour and material costs that **Transpower** will incur in undertaking the **outage**:
 - (B) any direct labour and material costs that **designated transmission customers** will incur as a result of **Transpower** undertaking the **outage**:
 - (C) any increase in the estimate of **expected unserved energy** in MWh multiplied by the value per MWh of that **expected unserved energy**, arising from the loss of **supply** during the **outage**:

- (CA) any additional fuel costs incurred by a **generator** in respect of any **generating units** that will be **dispatched** or are likely to be **dispatched** during or after the **outage** and as a result of the **outage**;
 - (D) any relevant cost specified in clause 12.43(1)(a)(iv);
 - (E) any other relevant cost to a person that produces, transmits, retails or consumes **electricity** in New Zealand; and
 - (ii) estimate the following benefits:
 - (A) any reduction in maintenance costs resulting from the **outage** (including **Transpower's** and any **designated transmission customer's** costs);
 - (B) if the **outage** will result in a decreased risk of loss of **supply**, any decrease in the estimate of **expected unserved energy** in MWh multiplied by the value per MWh of that **expected unserved energy**;
 - (C) any reduction in fuel costs incurred by a **generator** in respect of any **generating units**, arising or likely to arise during or after the **outage** and as a result of the **outage**;
 - (D) any relevant benefit specified in clause 12.43(1)(b)(iv);
 - (E) any other relevant benefit to a person that produces, transmits, retails or consumes **electricity** in New Zealand; and
 - (iii) carry out the **outage** only if the costs estimated under subparagraph (i) are less than the benefits estimated under subparagraph (ii).
- (3) In providing for the matters referred to in subclause (2), the **Outage Protocol** must include the following requirements:
- (a) **Transpower's** estimate of the fuel costs under subclause (2)(b) and (c) must—
 - (i) in relation to thermal **generating stations**, be a reasonable estimate of the fuel costs, based on the economic value of the fuel required for the relevant thermal **generating station**, and justified by **Transpower** with reference to opinions on the economic value of the fuel, provided by 1 or more independent and suitably qualified persons; and
 - (ii) in relation to hydroelectric **generating stations**—
 - (A) be a reasonable estimate of the fuel costs, based on the economic value of the water stored at a hydroelectric **generating station**, provided by a suitably qualified person other than—
 - (1) **Transpower**; or
 - (2) an employee of **Transpower**; and
 - (B) be **published**, as provided for in the **Outage Protocol**:
 - (b) the direct labour costs of **Transpower** and **designated transmission customers** under subclause (2) may include any amounts paid to contractors, but must not include any apportionment of the overheads or office costs of **Transpower** or **designated transmission customers**;
 - (c) the material costs of **Transpower** and **designated transmission customers** under subclause (2) are the costs of the materials used in carrying out the work during the **outage**;

- (d) the estimate of **expected unserved energy** in MWh multiplied by the value per MWh of that **expected unserved energy** under subclause (2) must—
- (i) in the case of **connection assets**, be based on—
 - (A) the estimated amount and value of the **expected unserved energy** as agreed between **Transpower** and each affected **designated transmission customer**; or
 - (B) if **Transpower** and a **designated transmission customer** cannot agree on the amount and value of the **expected unserved energy** under subparagraph (A), the **value of expected unserved energy** in clause 4 of Schedule 12.2 and **Transpower's** estimate of the **expected unserved energy** in respect of each affected **designated transmission customer** and end use customer; and
 - (ii) in the case of **interconnection assets**, be based on—
 - (A) the **value of expected unserved energy** in clause 4 of Schedule 12.2; and
 - (B) **Transpower's** estimate of the **expected unserved energy** in respect of each affected **designated transmission customer** and end use customer.
- (4) In addition to the requirements in subclause (3), the **Outage Protocol** must require **Transpower**, in planning for **outages**, to consider any reasonably expected operating conditions, forecasts in the **system security forecast**, likely fuel costs, and any other reasonable assumptions.
- (5) The **Outage Protocol** must include a methodology for determining **expected unserved energy** for the purposes of subclause (2)(a) to (c) that complies with subclauses (3)(d) and (4).
- (6) The **Outage Protocol** may permit **Transpower** to—
- (a) make only a reasonable estimate of the matters specified in subclauses (2) to (4) based on information reasonably available to it at the time **Transpower** considers whether to carry out a **planned outage**, and taking into account the number of **assets** to which the proposed **outage** applies, the value of the **assets** involved, the size of the load served by the **assets**, the proposed duration of the **outage**; and
 - (b) apply differing levels of rigour in different circumstances, which may include taking into account the number of **assets** to which a proposed **outage** applies, the value of the **assets** involved, the size of the load served by the **assets**, the proposed duration of the **outage**, and any other relevant matters.

Compare: Electricity Governance Rules 2003 rule 5.6 section VII part F

Clause 12.141(2) to (4): substituted, on 16 December 2013, by clause 11 of the Electricity Industry Participation (Urgent Temporary Grid Reconfiguration) Code Amendment 2013.

Clause 12.141(3)(d)(i)(B): amended, on 1 February 2016, by clause 57(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 12.141(3)(d)(i)(B): amended, on 1 November 2018, by clause 80 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2018.

Clause 12.141(3)(d)(ii)(A): amended, on 1 February 2016, by clause 57(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Clause 12.141(3)(d)(ii)(B): amended, on 1 November 2018, by clause 80 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2018.

12.142 Planned outages required in order to give effect to an investment or required by the Act

- (1) The **Outage Protocol** must set out requirements for **Transpower** to consider when determining the timing of **planned outages** that are required in order to give effect to an **approved investment** or that are required by the Electricity Act 1992.
- (2) The requirements specified under subclause (1) must require **Transpower** to give effect to the net benefit principle in clause 12.140(2) in determining the timing and duration of **outages** subject to this clause, and may require **Transpower** to consider some or all of the costs and benefits specified in clause 12.141.

Compare: Electricity Governance Rules 2003 rule 5.7 section VII part F

12.143 Required content of Outage Protocol in relation to unplanned outages

- (1) The **Outage Protocol** must—
 - (a) set out procedures and policies for dealing with **unplanned outages**, so as to minimise the costs and, if relevant, maximise the benefits arising from an **unplanned outage**; and
 - (b) set out the reasonable steps and measures that **Transpower** must take in order to be prepared for **unplanned outages**, so as to ensure that it is readily able to deal with **unplanned outages** in a way that minimises the costs and, if relevant, maximises the benefits arising from an **unplanned outage**; and
 - (c) require **Transpower** to deal with **unplanned outages** as quickly as reasonably possible, in accordance with the procedures specified in the **Outage Protocol**.
- (2) The costs and benefits under subclause (1) are the costs and benefits of the **outage** to persons who produce, transmit, distribute, retail, or consume **electricity**.

Compare: Electricity Governance Rules 2003 rule 6 section VII part F

12.144 Reporting on compliance with Outage Protocol

The **Outage Protocol** must require **Transpower** to publish and report to **designated transmission customers** and the **Authority**, whether in the report provided under clause 12.118 or otherwise, on its compliance with the requirements of the **Outage Protocol**, including the requirements specified in clause 12.140(1) for giving effect to the net benefit principle specified in clause 12.140(2) and the requirements of the **Outage Protocol** relating to **unplanned outages** specified in clause 12.143.

Compare: Electricity Governance Rules 2003 rule 7 section VII part F

Decisions on Outage Protocol

12.145 Authority may initially approve the proposed Outage Protocol or refer back to Transpower

After consideration of **Transpower's** proposed **Outage Protocol** and accompanying explanation and **statement of proposal**, the **Authority** may—

- (a) provisionally approve the proposed **Outage Protocol** having regard to the principles in clause 12.134 and the matters set out in clauses 12.135 to 12.144; or

- (b) refer the proposed **Outage Protocol** and accompanying explanation and regulatory statement back to **Transpower**, if in the **Authority's** view—
- (i) the proposed **Outage Protocol** does not adequately give effect to or promote the principles in clause 12.134; or
 - (ii) the proposed **Outage Protocol** does not adequately provide for the matters set out in clauses 12.135 to 12.144; or
 - (iii) the explanation or **statement of proposal** provided with the **Outage Protocol** in accordance with clause 12.133(3) is not adequate—
- and **Transpower** must, within 20 **business days** (or such longer period as the **Authority** may allow), consider the **Authority's** concerns and resubmit its proposed **Outage Protocol** and accompanying explanation and **statement of proposal** for reconsideration by the **Authority**.

Compare: Electricity Governance Rules 2003 rule 9 section VII part F

12.146 Reconsideration of revised Outage Protocol by the Authority

After reconsideration of **Transpower's** proposed **Outage Protocol**, and accompanying explanation and **statement of proposal**, as revised under clause 12.145(b), the **Authority** may either—

- (a) provisionally approve the proposed **Outage Protocol**, as revised, having regard to the principles in clause 12.134 and the matters set out in clauses 12.135 to 12.144; or
- (b) if the **Authority** considers that the **Outage Protocol** resubmitted by **Transpower** under clause 12.145(b) does not adequately give effect to or promote the principles in clause 12.134, or adequately provide for the matters set out in clauses 12.135 to 12.144, the **Authority** may make any amendments to the proposed **Outage Protocol**, as revised, that it considers necessary.

Compare: Electricity Governance Rules 2003 rule 10 section VII part F

12.147 Authority must consult on the proposed Outage Protocol

The **Authority** must **publish** the proposed **Outage Protocol**, either as provisionally approved by the **Authority** or as amended by the **Authority**, as soon as is practicable, for consultation with any person that the **Authority** thinks is likely to be materially affected by the proposed **Outage Protocol**.

Compare: Electricity Governance Rules 2003 rule 11 section VII part F

12.148 Authority may undertake additional consultation

As well as the consultation required under clause 12.147, the **Authority** may undertake any other consultation it considers necessary.

Compare: Electricity Governance Rules 2003 rule 12 section VII part F

12.149 Decision on Outage Protocol

- (1) When the **Authority** has completed its consultation on the proposed **Outage Protocol**, it must consider whether to incorporate the proposed **Outage Protocol** by reference as the **Outage Protocol**.

- (2) If the **Authority** decides to incorporate the **Outage Protocol** by reference in this Code, the Authority must determine a date on which the incorporation by reference takes effect and comply with Schedule 1 of the Act in relation to it.

Compare: Electricity Governance Rules 2003 rule 13 section VII part F

12.150 Incorporation of Outage Protocol by reference

- (1) The **Outage Protocol** is incorporated by reference in this Code in accordance with section 32 of the Act.
- (2) Subclause (1) is subject to Schedule 1 of the Act, which includes a requirement that the **Authority** must give notice in the *Gazette* before an amendment or substituted **Outage Protocol** becomes incorporated by reference in this Code.

Clause 12.150(1): amended, on 5 October 2017, by clause 320(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 12.150(2): amended, on 5 October 2017, by clause 320(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Complying with Outage Protocol

12.151 Compliance with Outage Protocol

- (1) **Transpower** and each **designated transmission customer** must comply with the **Outage Protocol**, unless agreed otherwise by **Transpower** and a **designated transmission customer** in respect of specified **assets** or the **designated transmission customer** in accordance with subclause (2).
- (2) An agreement between **Transpower** and a **designated transmission customer** to which the **Outage Protocol** does not apply in respect of specified **assets** must not exclude the application of subclause (3)(b) and must be conditional in all respects on—
- (a) obtaining agreement from all other potentially affected **designated transmission customers** that the **Outage Protocol** does not apply in respect of the specified **assets** or the **designated transmission customer**; and
- (b) **Transpower** and the **designated transmission customer** satisfying the **Authority** that they have consulted with all potentially affected end use customers on the **Outage Protocol** not applying in respect of the specified **assets** or the **designated transmission customer** and that there are no material unresolved issues affecting the interests of those end use customers.
- (3) **Transpower** must—
- (a) give written notice to the **Authority** as soon as practicable if **Transpower** enters into an agreement with a **designated transmission customer** under this clause; and
- (b) **publish** the agreement no later than 20 **business days** after entering into the agreement.

Compare: Electricity Governance Rules 2003 rule 15 section VII part F

Clause 12.151(2): amended, on 5 October 2017, by clause 321(a) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Clause 12.151(3): replaced, on 5 October 2017, by clause 321(b) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Schedule 12.1

Categories of designated transmission customers

cl 12.7

1 Categories of designated transmission customers required to enter into transmission agreements with Transpower

- (1) The categories of **designated transmission customers** required to enter into **transmission agreements** with **Transpower** are—
 - (a) **connected asset owners**; and
 - (b) *[Revoked]*
 - (c) **generators** that are directly connected to the **grid**.
- (2) *[Revoked]*
- (3) *[Revoked]*
- (4) *[Revoked]*
- (5) *[Revoked]*

Compare: Electricity Governance Rules 2003 schedule F1 part F

Schedule 12.1, clause 1(1): amended, on 16 December 2013, by clause 9(1) of the Electricity Industry Participation (Revocation of Part 16) Code Amendment 2013.

Schedule 12.1, clause 1(1)(a): amended, on 1 February 2016, by clause 58(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Schedule 12.1, clause 1(1)(b): revoked, on 1 February 2016, by clause 58(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Schedule 12.1, clause 1(1)(c): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Schedule 12.1, clause 1(1)(c): amended, on 5 October 2017, by clause 322 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Schedule 12.1, clause 1(2) to (5): revoked, on 16 December 2013, by clause 9(2) of the Electricity Industry Participation (Revocation of Part 16) Code Amendment 2013.

Schedule 12.2

Grid reliability standards

1 Preamble

Clause 12.55 of this Code, requires the **Authority** to determine the most appropriate **grid reliability standards** and in so doing must have regard to the purposes in clause 12.56 and the principles set out in clause 12.57, as required by clause 12.55.

Compare: Electricity Governance Rules 2003 clause 2 schedule F3 part F

2 The grid reliability standards

- (1) The purpose of the **grid reliability standards** is to provide a basis for **Transpower** and other parties to appraise opportunities for transmission investments and **transmission alternatives**.
- (2) For the purpose of subclause (1), the **grid** satisfies the **grid reliability standards** if—
 - (a) the power system is reasonably expected to achieve a level of reliability at or above the level that would be achieved if all **economic reliability investments** were to be implemented; and
 - (b) with all **assets** that are reasonably expected to be in service, the power system would remain in a **satisfactory state** during and following a **single credible contingency event** occurring on the **core grid**.
- (3) For the purpose of subclause (2)(a), the expected level of reliability of the power system must be assessed at each and every **grid exit point** and **grid injection point** (wherever located on the **grid**).
- (4) For the purpose of subclause (2)(a) and (b), the expected level of reliability, and state, of the power system must be assessed using the range of relevant operating conditions that could reasonably be expected to occur.

Compare: Electricity Governance Rules 2003 clauses 3 to 6 schedule F3 part F

3 Interpretation and definitions

- (1) For the purposes of these **grid reliability standards**, unless the context calls for another interpretation—
 - (a) the terms defined in Part 1 of this Code take that defined meaning; and
 - (b) the term defined in subclause (2) takes that defined meaning; and
 - (c) a reference—
 - (i) to the singular includes the plural and conversely; and
 - (ii) to a person includes an individual, company, other body corporate, association, partnership, firm, joint venture, trust, or Government Agency; and
 - (d) the word including or includes means including, but not limited to, or includes, without limitation; and
 - (e) the other grammatical forms of the term defined in subclause (2) have a corresponding meaning.
- (2) **Economic reliability investments** means investments in the **grid** and **transmission**

alternatives that would satisfy the economic test for an investment proposal applied by the Commerce Commission under Part 4 of the Commerce Act 1986—

- (a) assuming that the economic test was applied to both investments in the **grid and transmission alternatives**; and
- (b) having regard to Parts 7 and 8 (including the **policy statement**).

Compare: Electricity Governance Rules 2003 clauses 7 and 8 schedule F3 part F

4 Value of expected unserved energy

- (1) The value of any **expected unserved energy** is—
 - (a) \$20,000 per **MWh**; or
 - (b) such other value as the **Authority** may determine.
- (2) The **Authority** may determine different **values of expected unserved energy** under this clause for different purposes and for different times.
- (3) If the **Authority** determines a **value of expected unserved energy** under this clause, the **Authority** must **publish** its determination.

Schedule 12.2, clause 4(1): amended, on 1 February 2016, by clause 59(1) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Schedule 12.2, clause 4(2): amended, on 1 February 2016, by clause 59(2) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Schedule 12.2, clause 4(3): amended, on 1 February 2016, by clause 59(3) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Schedule 12.3 Core grid determination

cl 12.63

1 Background

Clause 12.63 of this Code, requires the **Authority** to determine the most appropriate **core grid determination** and in so doing to have regard to the purposes set out in clause 12.64, the principles set out in clause 12.57 for the **grid reliability standards** and the objectives set out in clause 12.65.

Compare: Electricity Governance Rules 2003 clause 2 schedule F3A part F

2 The core grid determination

- (1) The purpose of this **core grid determination** is to define the **core grid** for the purposes of the **grid reliability standards** and so provide a basis for—
 - (a) the **Authority** to determine the **grid reliability standards**; and
 - (b) **Transpower** and other parties to appraise opportunities for transmission investment and **transmission alternatives**.
- (2) The **core grid** consists of those assets that comprise the transmission links listed in Table 1 below:

Table 1

North Island core grid links	South Island core grid links
220kV Huapai-Marsden	220kV Islington-Kikiwa
220kV Huapai-Bream Bay	220kV Kikiwa-Stoke
220kV Bream Bay-Marsden	220kV Twizel-Tekapo B
110kV Marsden-Maungatapere	220kV Tekapo B-Islington
220 kV Henderson-Huapai	220kV Twizel-Opihi-Timaru-Ashburton
220 kV Albany-Huapai	220kV Ashburton-Bromley
220 kV Albany-Henderson	220kV Bromley-Islington
110kV Albany-Henderson	220kV Twizel-Opihi-Timaru-Islington
110kV Henderson-Hepburn Rd	220kV Livingstone-Islington
220kV Otahuhu-Henderson	220kV Benmore-Ohau B
220kV Otahuhu-Southdown	220kV Ohau B-Twizel
220kV Southdown-Henderson	220kV Benmore-Twizel
220kV Otahuhu-Penrose	220kV Benmore-Ohau C
110kV Mangere-Roskill	220kV Ohau C-Twizel
110kV Otahuhu-Roskill	220kV Benmore-Aviemore
110kV Otahuhu-Pakuranga	220kV Clyde-Cromwell
110kV Otahuhu-Wiri	220kV Cromwell-Twizel
220kV Otahuhu-Takanini	220kV Roxburgh-Clyde
220kV Huntly-Takanini	220kV Naseby-Livingstone
110kV Wiri-Bombay	220kV Roxburgh-Naseby
220kV Huntly-Glenbrook	220kV Roxburgh-Three Mile Hill

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Schedule 12.3

North Island core grid links	South Island core grid links
220kV Glenbrook-Takanini	220kV Three Mile Hill-Half Way Bush
220kV Otahuhu-Whakamaru	220kV Three Mile Hill-Sth Dunedin
220kV Otahuhu-Huntly	220kV Sth Dunedin-Half Way Bush
220kV Huntly-Hamilton	220kV Manapouri-Invercargill
110kV Mt Maunganui-Tarukenga	220kV Manapouri-Nth Makarewa
110kV Tarukenga-Tauranga	220kV Nth Makarewa-Invercargill
220kV Tarukenga-Edgecumbe	220kV Invercargill-Roxburgh
220kV Edgecumbe-Kawerau	220kV Invercargill-Tiwai Pt
220kV Kawerau-Ohakuri	220kV Nth Makarewa-Tiwai Pt
220kV Wairakei-Ohakuri	220/66kV interconnection Islington
220kV Ohakuri-Atiamuri	66kV Islington-Addington
220kV Atiamuri-Tarukenga	220/66kV interconnection Bromley
220kV Atiamuri-Whakamaru	
220kV Wairakei-Redclyffe	
220kV Wairakei-Whirinaki	
220kV Whirinaki-Redclyffe	
220kV Hamilton-Whakamaru	
220kV Tokaanu-Whakamaru	
220kV Bunnythorpe-Tokaanu	
220kV Bunnythorpe-Tangiwai	
220kV Rangipo-Tangiwai	
220kV Rangipo-Wairakei	
220kV Wairakei-Poihipi	
220kV Poihipi-Whakamaru	
220kV Stratford-New Plymouth	
110kV New Plymouth-Carrington St	
220kV Bunnythorpe-Haywards	
220kV Haywards-Wilton	
220kV Haywards- Linton	
220kV Wilton-Linton	
220kV Bunnythorpe-Linton	
110kV Wilton-Central Park	
110kV Takapu Rd-Wilton	
220kV Bunnythorpe-Brunswick	
220kV Brunswick-Stratford	
110kV Otahuhu-Mangere	
110kV Haywards-Takapu Rd	
220/110kV interconnection Marsden	
220/110kV interconnection Albany	
220/110kV interconnection Henderson	
220/110kV interconnection Penrose	
220/110kV interconnection Otahuhu	
220/110kV interconnection Hamilton	

North Island core grid links	South Island core grid links
220/110kV interconnection Tarukenga 220/110kV interconnection New Plymouth 220/110kV interconnection Stratford 220/110kV interconnection Redclyffe 220/110kV interconnection Bunnythorpe 220/110kV interconnection Haywards 220/110kV interconnection Wilton	

Compare: Electricity Governance Rules 2003 clauses 3 and 4 schedule F3A part F

3 Interpretation

For the purposes of this **core grid determination**, unless the context calls for another interpretation, a term has the meaning given to that term in the **grid reliability standards**.

Compare: Electricity Governance Rules 2003 clause 5 schedule F3A part F

Schedule 12.4 Transmission Pricing Methodology

cl 12.84

1 Introduction

The **transmission pricing methodology** is used to recover the full economic costs of **Transpower's** services, with the exception of investment contracts entered into under clauses 12.70 and 12.71 of this Code, existing new investment contracts and other contracts of the kind referred to in clause 12.95 of this Code. The full economic costs of **Transpower's** services include costs relating to investments which are not subject to approval by the Commerce Commission under section 54R of the Commerce Act 1986 or to which the input methodology under section 54S of that Act applies.

Compare: Electricity Governance Rules 2003 clause 1 schedule F5 part F

2 Overview of the Pricing Methodology—

- (1) **Transpower's** principal objective as a State Owned Enterprise is to operate as a successful business. To this end **Transpower's** pricing must, subject to Part 4 of the Commerce Act 1986, recover the costs of providing its transmission services, which include capital, maintenance, operating and overhead costs. Before the start of each **pricing year**, **Transpower's** Board approves forecasts of—
 - (a) the revenue required to recover the costs of providing AC transmission services during the **pricing year**. This forecast is referred to as the **AC revenue** for that **pricing year**; and
 - (b) the revenue required to recover the costs of providing the **HVDC assets** during the **pricing year**. This forecast is referred to as the **HVDC revenue** for that **pricing year**.
- (2) The **transmission pricing methodology** comprises—
 - (a) **connection** charges, which recover part of **Transpower's AC revenue** by reference to the cost of providing **connection assets**. Clauses 8 to 26 describe how **connection** charges are calculated;
 - (b) interconnection charges, which recover the remainder of **Transpower's AC revenue**. Clauses 27 to 30 describe how interconnection charges are calculated; and
 - (c) HVDC charges, which recover **Transpower's HVDC revenue**. Clauses 31 to 33D describe how HVDC charges are calculated.
- (3) An overview of how **Transpower's AC revenue** and **HVDC revenue** are recovered through these charges is shown in diagrammatic form in Appendix A.
- (4) The **transmission pricing methodology** also describes—
 - (a) how the costs of **transmission alternative** services are charged and recovered, if and when **transmission alternatives services** are provided and/or funded by **Transpower** (clause 35); and
 - (b) practical ways to facilitate greater transparency in relation to **Transpower's** prudent discount policy, which helps to ensure that the **transmission pricing**

methodology does not provide incentives for inefficient by-pass of the existing grid (clauses 36 to 42).

Compare: Electricity Governance Rules 2003 clause 2 schedule F5 part F
Schedule 12.4, clause 2(2)(a): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.
Schedule 12.4, clause 2(2)(c): amended, on 1 April 2017, by clause 4 of the Electricity Industry Participation Code Amendment (Transmission Pricing) 2015.

3 Definitions and interpretation

Unless the context otherwise requires—

AC asset means a **grid asset** other than an **HVDC asset**

AC revenue has the meaning set out in clause 2(1)

AC switch means a switch that is an **AC asset**

alternative project means an investment proposed by a **customer**, which if implemented, would bypass existing **grid assets**, but does not include proposed new generation

annual charges means any or all of the **annual connection charge**, **annual interconnection charge** and **annual HVDC charge** for a **customer** at a **connection location** for a **pricing year**

Schedule 12.4, clause 3, **annual charges**: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

annual connection charge has the meaning set out in clause 8(2)

annual HVDC charge has the meaning set out in clause 31

annual interconnection charge has the meaning set out in clause 27

anytime maximum demand or **AMD** for a **customer** at a **connection location** means the average of the 12 highest **offtake** quantities for that **customer** at that **connection location** during the **capacity measurement period** for the relevant **pricing year**. This definition is subject to clause 34 of this **transmission pricing methodology** and any prudent discount agreement

anytime maximum injection or **AMI** for a **customer** at a **connection location** means the average of the 12 highest **injection** quantities for that **customer** at that **connection location** during the **capacity measurement period** for the relevant **pricing year**. This definition is subject to clause 34 of this **transmission pricing methodology** and any prudent discount agreement

capacity measurement period means, for a **pricing year**—

- (a) for every purpose other than determining **regional peak demand periods** for the Lower South Island, Lower North Island and Upper North Island, the 12 month period commencing 1 September and ending with the close of 31 August, immediately before the commencement of the **pricing year**:
- (b) for the purpose of determining **regional peak demand periods** for the Lower South Island, Lower North Island, and Upper North Island, the period specified in

paragraph (a), excluding within that period the period commencing 1 November and ending with the close of 30 April

Schedule 12.4, clause 3, **capacity measurement period**: replaced, on 1 April 2017, by clause 5(1)(a) of the Electricity Industry Participation Code Amendment (Transmission Pricing) 2015.

connection asset has the meaning set out in clause 6(1)

connection link has the meaning set out in clause 5(c)

connection location means the **substation** or other location at which a **customer's assets** are directly **connected to the grid**

Schedule 12.4, clause 3, **connection location**: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

connection node has the meaning set out in clause 5(b)

customer means a person who has or controls **assets** directly **connected to the grid** and, in relation to a **connection location**, means a person who has or controls **assets** directly **connected to the grid** at that **connection location**. A **customer** may be both an **offtake customer** and an **injection customer** at the same **connection location**

Schedule 12.4, clause 3, **customer**: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

customer allocation has the meaning set out in clause 25(1)

financial year means the financial year adopted by **Transpower** from time to time, being a 12 month period or such other period as **Transpower** determines.

Transpower's current financial year is a 12 month period from 1 July to 30 June

grid assets means assets and other works (including **land and buildings**) owned or operated by **Transpower**, which form part of the **grid** or are required to support the **grid**

GXP tie means a situation in which **GXPs** are simultaneously **connected to the grid** at more than 1 **point of connection**

Schedule 12.4, clause 3, **GXP tie**: inserted, on 1 April 2017, by clause 5(2) of the Electricity Industry Participation Code Amendment (Transmission Pricing) 2015.

historical anytime maximum injection or **HAMI** is the value calculated under clauses 33D and 34

Schedule 12.4, clause 3, **historical anytime maximum injection** or **HAMI**: replaced, on 1 April 2017, by clause 5(1)(b) of the Electricity Industry Participation Code Amendment (Transmission Pricing) 2015.

HVDC assets means the **HVDC link** and all **land and buildings** associated with the **HVDC link**

HVDC customer means a **customer** who is, from time to time, the owner or operator of—

- (a) **South Island generation** which is directly **connected to the grid assets**; or
- (b) a **local network** to which **South Island generation** is **connected**, either directly or indirectly;

Schedule 12.4, clause 3, **HVDC customer**: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

HVDC revenue has the meaning set out in clause 2(1)

independent expert means an independent person who is a recognised technical expert in the matter that has been referred to him or her. In appointing an **independent expert** the party referring the matter to the **independent expert** must nominate 3 persons and the other party may agree that any one of them be appointed. Failing agreement between the parties, the **independent expert** will be appointed by the **Authority**

injection means the net quantity of **electricity** flow into the **grid** at a **connection location** from a **customer's assets** during a **half hour** determined from **metering information**. This definition is subject to clause 34 of this **transmission pricing methodology** and any prudent discount agreement

injection customer means, subject to clause 34, in relation to a **connection location**, a **customer** who has or controls assets from which electricity flowed into the **grid** at that **connection location** in any **half hour** during the **capacity measurement period** for the relevant **pricing year** or, if the **connection location** is a **South Island generation connection location**, an **HVDC customer** who has or controls assets from which electricity flowed into the **grid** at the **South Island generation connection location** in any **half hour** during the **capacity measurement period** for the relevant **pricing year** or a **capacity measurement period** for any of the 4 immediately preceding **capacity measurement periods**

interconnection asset has the meaning set out in clause 6(2)

interconnection link has the meaning set out in clause 5(d)

interconnection node has the meaning set out in clause 5(a)

land and buildings means any and all land or interest in land (including easements) acquired by **Transpower** for the purposes of establishing a **connection location** or **substation**, or for supporting **grid assets**, together with all buildings, oil containment facilities and the capitalised cost of establishing a **connection location** or **substation** or other **grid asset** (as the case may be)

link has the meaning set out in clause 4(3)

monthly charges means any or all of the **monthly connection charge**, **monthly interconnection charge** and **monthly HVDC charge** for a **customer** at a **connection location**

monthly connection charge has the meaning set out in clause 8(2)

monthly HVDC charge has the meaning set out in clause 31

monthly interconnection charge has the meaning set out in clause 27

new investment contract means a contract entered into at any time between **Transpower** and a **customer** of **Transpower**, under which **Transpower** agrees to provide any new or upgraded **grid assets** and the **customer** agrees to pay charges based on **Transpower's** cost of providing the new or upgraded **grid assets**. It includes, but is not limited to a **new investment agreement contract** as defined in Part 1 of this Code

node has the meaning set out in clause 4(1)

offtake means the net quantity of **electricity** flow out of the **grid** at a **connection location** into **customer assets** during a **half hour** determined from **metering information**. This definition is subject to clause 34 of this transmission pricing methodology and any prudent discount agreement

offtake customer means, subject to clause 34, in relation to a **connection location**, a **customer** who has or controls assets into which electricity flowed from the **grid** at that **connection location** in any **half hour** during the **capacity measurement period** for the relevant **pricing year**

optimised replacement cost means, for any assets or group of assets, the optimised replacement cost of that asset or group of assets recorded in a Transpower asset register as at the **transition date**

point of injection means a **connection location** at which an **injection customer** has assets **connected** to the **grid**

Schedule 12.4, clause 3, **point of injection**: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

pricing year means the period from April 1 to March 31, in respect of which **Transpower** calculates its prices

region means a group of **connection locations**, being one of the groups described in Appendix B as—

- (a) Upper North Island; and
- (b) Lower North Island; and
- (c) Upper South Island; and
- (d) Lower South Island

Schedule 12.4, clause 3, **region**: amended, on 1 April 2017, by clause 5(3) of the Electricity Industry Participation Code Amendment (Transmission Pricing) 2015.

regional coincident peak demand or **RCPD** for a **customer** at a **connection location** means the **customer's offtake** at that **connection location** during a **regional peak demand period**. This definition is subject to clause 34 of this **transmission pricing methodology** and any prudent discount agreement

Schedule 12.4, clause 3 **regional coincident peak demand**: inserted, on 15 May 2014, by clause 34(b) of the Electricity Industry Participation (Minor Code Amendments) Code Amendment 2014.

regional demand means, in any **half hour**, the sum over all **customers** at all **connection locations** in a **region** of all **offtake** quantities at those **connection locations**

regional peak demand period means, for each **region**, a **half hour** in which any of the 100 highest **regional demands** occur in the **region** during a **capacity measurement period** for the relevant **pricing year**. This definition is subject to clause 34 of this **transmission pricing methodology** and any prudent discount agreement

Schedule 12.4, clause 3, **regional peak demand period**: replaced, on 1 April 2017, by clause 5(1)(c) of the Electricity Industry Participation Code Amendment (Transmission Pricing) 2015.

regional coincident peak [*Revoked*]

Schedule 12.4, clause 3 **regional coincident peak**: revoked, on 15 May 2014, by clause 34(a) of the Electricity Industry Participation (Minor Code Amendments) Code Amendment 2014.

replacement cost means—

- (a) for a **connection asset** commissioned before the **transition date**, the cost of replacing that asset (either separately or as part of a group of assets) with a modern equivalent asset with the same service potential, multiplied by the **replacement cost adjustment factor**; and
- (b) for any other **grid asset**, the cost of replacing that asset (either separately or as part of a group of assets) with a modern equivalent asset with the same service potential,

as determined by **Transpower** and (unless stated otherwise) recorded in a **Transpower** asset register;

replacement cost adjustment factor means for any asset (or group of assets) the percentage which is the **optimised replacement cost** divided by the cost, as at (or about) the **transition date**, of replacing that asset (or group of assets) with the then modern equivalent asset with the same service potential

reverse flow means **electricity** exiting the **grid** at a **GXP** and entering the **grid** at another **GXP** as a result of a **GXP tie**

Schedule 12.4, clause 3, **reverse flow**: inserted, on 1 April 2017, by clause 5(2) of the Electricity Industry Participation Code Amendment (Transmission Pricing) 2015.

South Island generation means, subject to clause 34, any **generating unit** or **generating station** located in the South Island, which:

- (a) is directly **connected** to the **grid** or is **connected** to a **local network** which is **connected** (directly or indirectly) to the **grid**; and
- (b) has (directly or indirectly) injected electricity into the **grid** at any time during any **capacity measurement period** for all or any of the previous **5 pricing years**

Schedule 12.4, clause 3, **South Island generation**: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Schedule 12.4, clause 3, **South Island generation**: amended, on 1 April 2017, by clause 5(4) of the Electricity Industry Participation Code Amendment (Transmission Pricing) 2015.

South Island generation connection location means any **connection location** at which **South Island generation** is **connected** to the **grid** either directly, or indirectly via **connection** of a **local network**, to which **South Island generation** is in turn either directly or indirectly **connected** **substation** means a substation, including all **land and buildings**, switches, transformers, revenue meters and all other assets comprising or located at that substation

Schedule 12.4, clause 3, **South Island generation connection location**: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

South Island mean injection or **SIMI** is the value calculated under clauses 33B and 34

Schedule 12.4, clause 3, **South Island mean injection or SIMI**: inserted, on 1 April 2017, by clause 5(2) of the Electricity Industry Participation Code Amendment (Transmission Pricing) 2015.

transition date means the date of the last ODV report **published** by **Transpower** before the date on which this **transmission pricing methodology** takes effect

Schedule 12.4, clause 3, **transition date**: amended, on 5 October 2017, by clause 323 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

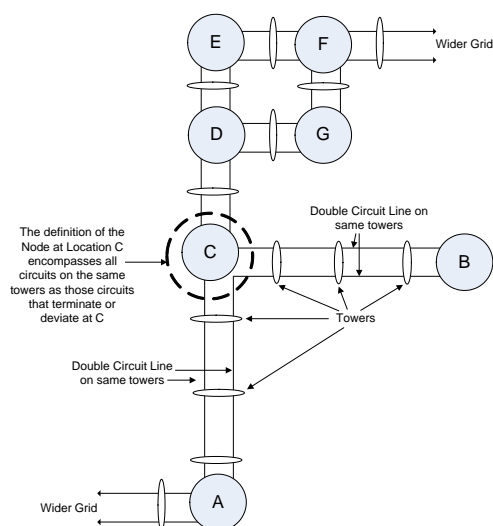
weighted average cost of capital means, for any **pricing year**, the pre-tax nominal weighted average cost of capital used by **Transpower** to determine **AC revenue** or **HVDC revenue** (as the case may be) for that **pricing year**.

Compare: Electricity Governance Rules 2003 clauses 3.1 to 3.53 schedule F5 part F

4 Definition of Nodes and Links

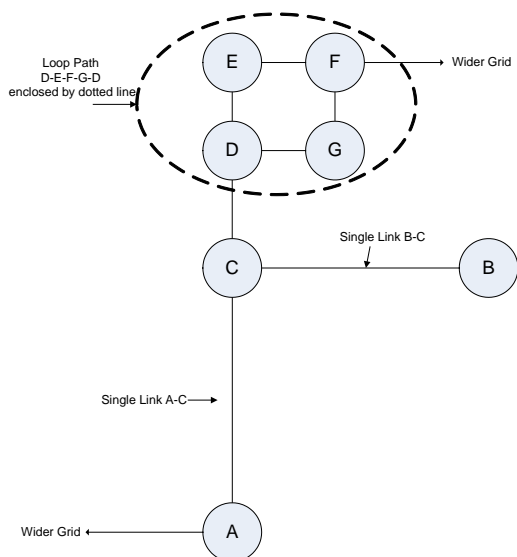
- (1) A **node** is any of the following:
 - (a) a **connection location**:
 - (b) a location where a circuit, which is **connected** to 2 or more other **nodes**, diverges or terminates (such as a “tee” point or a deviation):
 - (c) any **substation** or switching station.
- (2) Any **node** which connects with 1 or more multiple circuits on the same towers or poles where at least 1 of those circuits deviates or terminates at that **node** is treated as a single **node** encompassing all of those circuits at that location.

Figure 1: Illustration of definition of a node



- (3) A **link** is either a single circuit or multiple parallel circuits (of the same voltage) **connecting 2 nodes** (and includes any **grid assets**, such as circuit breakers, that are required to **connect the link** at either **node**).
- (4) Figures 1 and 2 illustrate how **nodes** and **links** are identified. In Figure 1, A, B, C, D, E, F and G are all **nodes**. C is a single **node**, because 1 of the circuits of the **link** AC terminates at C. AC, CD (and DE, EF, FG and GD) and BC are separate **links**, although AB may be recorded as a single line in a Transpower asset register. Figure 2 shows the same configuration as Figure 1 but describes the circuits by way of **links**.

Figure 2 – Illustration of links and loop path



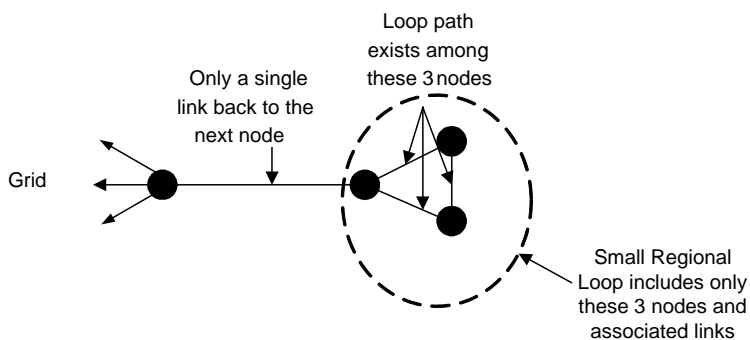
Compare: Electricity Governance Rules 2003 clauses 3.54 to 3.57 schedule F5 part F
Schedule 12.4, clause 4(1)(b): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.
Schedule 12.4, clause 4(3): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

5 Identification of Nodes and Links as Connection or Interconnection

Nodes and **links** are identified as **connection nodes** or **connection links** or **interconnection nodes** or **interconnection links** according to the following:

- (a) an **interconnection node** is any **node connected** to 2 or more **nodes** in a “loop”, other than a “small regional loop”. A loop is a continuous path of **nodes** and **links** with the same start and end **node**. A “small regional loop” is where a loop path exists between any group of **nodes** (excluding the **nodes** at Benmore and Haywards) with only a single **link** from the loop back to the next **node** that is outside the loop (see Figure 3 below):
- (b) a **connection node** is any **node** that is not an **interconnection node**:

Figure 3 – Example of a small regional loop



- (c) a **connection link** is a **link** with a **connection node** at one or more of its ends;
- (d) an **interconnection link** is a **link** that connects 2 **interconnection nodes**;
- (e) **links** and **nodes** that comprise a “small regional loop” are **connection links** and **connection nodes**.

Compare: Electricity Governance Rules 2003 clause 3.58 schedule F5 part F
Schedule 12.4, clause 5: amended, on 5 October 2017, by clause 324 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.
Schedule 12.4, clause 5(a): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

6 Definition of Connection Assets and Interconnection Assets

(1) A **connection asset** is—

- (a) any **grid asset** at a **connection node** other than **voltage support** equipment that is for **grid voltage support** purposes and has not been installed at a **customer's** request; and
- (b) at an **interconnection node** that is a **connection location**,—
 - (i) any **grid asset** that is specifically required to **connect a customer**, including a supply transformer, feeder bay or supply transformer high voltage or low voltage breaker. Low voltage breakers, low voltage bus section breakers, voltage transformers, revenue meters and other equipment where they are on the same bus as the feeders are also **connection assets**; and
 - (ii) any **grid asset** that is used both to **connect a customer** (whether injection or offtake) and for **grid** operation generally; and
 - (iii) a proportion of the **land and buildings** at that **connection location**. The proportion of **land and buildings** defined as a **connection asset** is that proportion which the **replacement cost** of the **connection assets** identified in subparagraph (i) but excluding **land and buildings**, bears to the **replacement cost** of all **grid assets** (excluding **land and buildings**) at the **connection location**; and
- (c) any **grid asset** that is a **connection link**. A single line, recorded as such in a **Transpower** asset register, may form part of more than 1 **link**, so that a portion of a line may be identified as a **connection asset** with the remaining portion identified as an **interconnection asset**. For example, in Figure 1, if a line AB were recorded in a **Transpower** asset register, it would form part of a **connection link** BC and an **interconnection link** AC. If part of a line is, or forms part of, a **connection link**, the value and costs ascribed to the **connection link** for the purposes of calculating **connection** charges is the same proportion that the ratio of the length of the **connection link** bears to the total length of the line.

(2) An **interconnection asset** is any **grid asset** that is not a **connection asset**, or an **HVDC asset**.

(3) A **connection asset** which connects a **customer's assets** at a **connection location** to the **interconnection assets** is referred to as a **connection asset** "for" or "which connects" (or other grammatical form of that phrase) that **connection location** or **customer's assets** (as the case may be).

Compare: Electricity Governance Rules 2003 clauses 3.59 to 3.61 schedule F5 part F

Schedule 12.4, clause 6(1)(b)(i) and (ii): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Schedule 12.4, clause 6(1)(c): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

7 Interpretation

Unless the context otherwise requires—

- (a) all defined terms are shown in bold text; and
- (b) terms defined in Part 1 of this Code have that defined meaning;
- (c) terms defined below and elsewhere in the text of this **transmission pricing methodology** take that defined meaning, and any other grammatical form of that term has a corresponding meaning; and
- (d) if there is any inconsistency between the text description of a calculation for which there is formula and the particular formula, the formula takes precedence; and
- (e) diagrams are for information only and do not form a binding part of this **transmission pricing methodology**; and
- (f) a reference—
 - (i) to the singular includes the plural and conversely; and
 - (ii) to a person includes an individual, company, other body corporate, association, partnership, firm, joint venture, trust or Government agency; and
- (g) the word "including" is to be read as "including, but not limited to", and the word "includes" is to be read as "includes, without limitation"; and
- (h) if any matter is to be determined by **Transpower** or **Transpower's** Board, it is to be determined in **Transpower's** or **Transpower's** Board (as the case may be) sole discretion while acting at all times reasonably; and
- (i) a reference to a preceding **financial year** is a reference to the first complete **financial year** that precedes the start of the **pricing year** in respect of which the relevant calculation is undertaken; and
- (j) a reference to a prudent discount agreement includes any agreement entered into under the prudent discount policy in clauses 36 to 42 and any agreement which has the same or similar purpose as the prudent discount policy (including a **notional embedding contract**) entered into between **Transpower** and a **customer** whether before or after commencement of this **transmission pricing methodology**.

Compare: Electricity Governance Rules 2003 clauses 3.62 to 3.71 schedule F5 part F

Connection Charges

8 Calculation of the Connection Charges

- (1) A **connection** charge for each **connection asset** for a **connection location** is calculated for each **pricing year** for each **customer** at that **connection location** by multiplying the sum of the asset, maintenance, operating and (for **injection customers**) overhead cost components for a **connection asset** by the relevant **customer allocation**, as follows:

$$\text{connection charge} = (A_{\text{conn}} + M_{\text{conn}} + O_{\text{conn}} + IO_{\text{conn}}) \times CA_{\text{conn}}$$

where

A_{conn} is the asset component for the **connection asset** calculated in accordance with clauses 10 to 12

M_{conn} is the maintenance component for the **connection asset** calculated in accordance with clauses 13 to 17 and is $M_{\text{conn sub}}$ or $M_{\text{conn line type}}$ depending on the nature of the **connection asset**

O_{conn} is the operating component for the **connection asset** calculated in accordance with clauses 18 to 20

IO_{conn} is the injection overhead component for the **connection asset** calculated in accordance with clauses 21 to 24

CA_{conn} is the customer allocation for the **connection asset** for the **connection location** in respect of which the **connection charge** is being calculated, calculated in accordance with clause 25(1) and (2)(a) to (c).

- (2) The sum of all **connection charges** calculated for a **customer** for all **connection assets** for a **connection location** in accordance with subclause (1) is the **annual connection charge** for that **customer** at that **connection location** in that **pricing year**. The **customer's monthly connection charge** at that **connection location** for that **pricing year** is (subject to clause 34 of this **transmission pricing methodology**) calculated as 1/12 of the **annual connection charge**. The example **connection charge** report at clause 25(3) illustrates how a **customer's annual connection charge** for a **connection location** is calculated. (3) If a **customer** is both an **offtake customer** and an **injection customer** at a **connection location**, **connection charges** for that **connection location** are calculated separately for that **customer** as an **offtake customer** and an **injection customer**.

Compare: Electricity Governance Rules 2003 clauses 4.1 to 4.3 schedule F5 part F
Schedule 12.4, clause 8: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.
Schedule 12.4, clause 8(2): amended, on 1 April 2017, by clause 6 of the Electricity Industry Participation Code Amendment (Transmission Pricing) 2015.

9 Calculation of Connection Charge Components

- (1) Each of the asset, maintenance, operating and overhead cost components of the **connection charge** is calculated by reference to a rate set for that component which is then applied to the particular **connection asset**. Different rates may be set for different types of **connection assets**; for example, different rates are used to calculate the **maintenance component** depending on whether the **connection asset** is located at a **substation** or is a line. Different types of **lines** have different rates. Clauses 10 to 26 describe how the rates are set and applied to determine each component of the **connection charge**.

- (2) The rates for each component of the **connection** charge are recalculated for each **pricing year**.

Compare: Electricity Governance Rules 2003 clauses 4.4 and 4.5 schedule F5 part F
Schedule 12.4, clause 9: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.
Schedule 12.4, clause 9(1): amended, on 1 February 2016, by clause 60 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

10 Asset Component

The asset component of the **connection** charge allocates a portion of the cost of funding all **connection assets** plus their depreciation to the **connection asset** for which the **connection** charge is being calculated.

Compare: Electricity Governance Rules 2003 clause 4.6 schedule F5 part F
Schedule 12.4, clause 10: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

11 Asset Return Rate

The asset return rate used to calculate the asset component is referred to as ARR_{conn} and is expressed as a proportion. ARR_{conn} is calculated by dividing the product of the **weighted average cost of capital** and the regulatory asset value of all **connection assets** plus the annual depreciation of those assets by the **replacement cost** of all **connection assets** as follows:

$$ARR_{\text{conn}} = \frac{WACC \times RAV_{\text{conn}} + D_{\text{conn}}}{\sum_{\text{conn}} RC_{\text{conn}}}$$

where

WACC is the **weighted average cost of capital** (expressed as a percentage)

RAV_{conn} is the regulatory asset value of all **connection assets**, as determined by **Transpower** and recorded in a **Transpower** asset register (expressed in dollars)

D_{conn} is total annual depreciation of all **connection assets** in the preceding **financial year** as determined by **Transpower** and recorded in a **Transpower** asset register (expressed in dollars)

$\sum_{\text{conn}} RC_{\text{conn}}$ is the total **replacement cost** of all **connection assets**.

Compare: Electricity Governance Rules 2003 clause 4.7 schedule F5 part F

12 Calculation of Asset Component

The **asset component** of a **connection** charge is calculated by multiplying ARR_{conn} by the **replacement cost** of the **connection asset** for which the **connection** charge is being calculated as follows:

$$A_{\text{conn}} = \text{ARR}_{\text{conn}} \times \text{RC}_{\text{conn}}$$

where

RC_{conn} is the **replacement cost** of the **connection asset** for which the **connection charge** is being calculated (expressed in dollars).

Compare: Electricity Governance Rules 2003 clause 4.8 schedule F5 part F
Schedule 12.4, clause 12: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

13 Maintenance component

- (1) The maintenance component of the **connection charge** allocates a portion of **Transpower's** total maintenance costs for all **connection assets** to the **connection asset** for which the **connection charge** is being calculated.
- (2) Maintenance recovery rates are set separately for **connection assets** located at **substations** and for the different types of **lines**. The different line types (all AC) used are—
 - (a) 220kV or higher voltage towerlines;
 - (b) other towerlines; and
 - (c) pole lines.

Compare: Electricity Governance Rules 2003 clauses 4.9 and 4.10 schedule F5 part F
Schedule 12.4, clause 13(1): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.
Schedule 12.4, clause 13(2): amended, on 1 February 2016, by clause 61 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

14 Substation Maintenance Recovery Rate

The maintenance recovery rate used to calculate the maintenance component of the **connection charge** for **connection assets** located at **substations** is referred to as $\text{MRR}_{\text{conn subs}}$ and is expressed as a proportion. $\text{MRR}_{\text{conn subs}}$ is calculated as the average of the annual maintenance costs incurred by **Transpower** for all **connection assets** located at all **substations** in each of the 4 immediately preceding **financial years** divided by the sum of the **replacement costs** of all **connection assets** located at all **substations** as follows:

$$\text{MRR}_{\text{conn subs}} = \frac{\text{MC}_{\text{conn subs}}}{\sum_{\text{subs conn}} \text{RC}_{\text{conn subs}}}$$

where

$\text{MC}_{\text{conn subs}}$ is the average of the annual maintenance costs incurred by **Transpower** for all **connection assets** located at all **substations** in each of the 4 immediately preceding **financial years**, as determined by **Transpower** and recorded in **Transpower's** Maintenance Management System accounts for each of those **financial years** (expressed in dollars)

$\sum_{\text{subs conn}} \sum \text{RC}_{\text{conn subs}}$ is the sum of the **replacement costs** of all **connection assets** located at all **substations**.

Compare: Electricity Governance Rules 2003 clause 4.11 schedule F5 part F
Schedule 12.4, clause 14: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

15 Calculation of Maintenance Component for a Connection Asset Located at a Substation

The maintenance component of the **connection** charge for a **connection asset** located at a **substation** is calculated by multiplying $\text{MRR}_{\text{conn subs}}$ by the **replacement cost** of the **connection asset** for which the **connection** charge is being calculated as follows:

$$M_{\text{conn subs}} = \text{MRR}_{\text{conn subs}} \times \text{RC}_{\text{conn subs}}$$

where

$\text{RC}_{\text{conn subs}}$ is the **replacement cost** of the **connection asset** for which the **connection** charge is being calculated (expressed in dollars).

Compare: Electricity Governance Rules 2003 clause 4.12 schedule F5 part F
Schedule 12.4, clause 15: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

16 Line Maintenance Recovery Rate

The maintenance recovery rate used to calculate the maintenance component of the **connection** charge for **connection assets** which are **lines** is referred to as $\text{MRR}_{\text{conn line type}}$ and is expressed as a dollar cost per length (expressed in km) of line for each line type. $\text{MRR}_{\text{conn line type}}$ is calculated for each of the 3 types of line referred to in clause 13(2) and is the average of annual maintenance costs incurred by **Transpower** for all **lines** of the type for which $\text{MRR}_{\text{conn line type}}$ is being calculated in each of the preceding 4 **financial years** divided by the total line length of line of that type as follows:

$$\text{MRR}_{\text{conn line type}} = \frac{\text{MC}_{\text{conn line type}}}{\text{TL}_{\text{conn line type}}}$$

where

$\text{MC}_{\text{conn line type}}$ is the average of the annual maintenance costs incurred by **Transpower** for all **lines** of the type for which the maintenance recovery rate is being calculated in each of the 4 immediately preceding **financial years**, as determined by **Transpower** and recorded in **Transpower's** Maintenance Management System accounts for each of those **financial years** (expressed in dollars)

$\text{TL}_{\text{conn line type}}$ is the total length of line of the type for which the maintenance recovery rate is being calculated forming part of the **grid assets** (other than **HVDC assets**), as determined by **Transpower** and

recorded in a **Transpower** asset register at the end of the immediately preceding **financial year** (expressed in km).

Compare: Electricity Governance Rules 2003 clause 4.13 schedule F5 part F
Schedule 12.4, clause 16: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.
Schedule 12.4, clause 16: amended, on 1 February 2016, by clause 62 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

17 Calculation of the Maintenance Component for Line Connection Assets

The maintenance component of the **connection** charge for a **connection asset** which is a line is calculated by multiplying $MRR_{\text{conn line type}}$ by the length of the line which is the **connection asset** for which the **connection** charge is being calculated as follows:

$$M_{\text{conn line type}} = MRR_{\text{conn line type}} \times L_{\text{conn line}}$$

where

$L_{\text{conn line}}$ is the length of the line which is the **connection asset** for which the **connection** charge is being calculated, as determined by **Transpower** and recorded in a **Transpower** asset register (expressed in km).

Compare: Electricity Governance Rules 2003 clause 4.14 schedule F5 part F
Schedule 12.4, clause 17: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

18 Operating Component

The operating component of the **connection** charge allocates a portion of **Transpower's** total operating cost for all **AC assets** to the **connection asset** for which the **connection** charge is being calculated.

Compare: Electricity Governance Rules 2003 clause 4.15 Schedule F5 part F
Schedule 12.4, clause 18: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

19 Operating Recovery Rate

The operating recovery rate used to calculate the operating component of the **connection** charge is referred to as **ORR** and is expressed as a dollar cost per switch. **ORR** is calculated by dividing the cost of operating all **AC switches** incurred by **Transpower** in the preceding **financial year** by the total number of **AC switches** less the product of 0.1 multiplied by the total number of **AC switches** operated by **customers** as follows:

$$ORR = \frac{OC}{TS}$$

where

OC is the cost associated with operating all **AC switches** incurred by **Transpower** in the immediately preceding **financial year**, as determined by **Transpower** and recorded in its Maintenance

Management System accounts for that **financial year** (expressed in dollars)

TS is the total number of **AC switches**, based on the number of switching devices in a **substation** or switching station, (as determined by **Transpower** and recorded in a **Transpower** asset register as at the end of the immediately preceding **financial year**) less the product of 0.1 multiplied by the total number of **AC switches** operated by **customers**.

Compare: Electricity Governance Rules 2003 clause 4.16 schedule F5 part F
Schedule 12.4, clause 19: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

20 Calculation of the Operating Component of the Connection Charge for a Connection Asset

The operating component of the **connection** charge for a **connection asset** is calculated by multiplying **ORR** by the number of **AC switches** that form part of the **connection asset** for which the **connection** charge is being calculated less the product of 0.1 multiplied by the number of **AC switches** within the **connection asset** that are operated by **customers** as follows:

$$O_{\text{conn}} = \text{ORR} \times S_{\text{conn}}$$

where

S_{conn} is the number of switches that form part of the **connection asset** for which the **connection** charge is being calculated, (as determined by **Transpower** and recorded in a **Transpower** asset register) less the product of 0.1 multiplied by the number of **AC switches** within the **connection asset** that are operated by **customers**.

Compare: Electricity Governance Rules 2003 clause 4.17 schedule F5 part F
Schedule 12.4, clause 20: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

21 Injection Overhead Component

Offtake customers pay a portion of **AC revenue** overhead costs through the interconnection charge. **Injection customers** are not charged an interconnection charge, so a share of **AC revenue** overhead cost is allocated through their **connection** charges. The injection overhead component of the **connection** charge is calculated only for **connection assets** that **connect a customer's assets** at a **point of injection** to the **interconnection assets** and therefore applies only to **injection customers**.

Compare: Electricity Governance Rules 2003 clause 4.18 schedule F5 part F
Schedule 12.4, clause 21: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

22 Injection Overhead Revenue

The portion of AC overhead cost to be recovered from **injection customers** is referred to as OHC_{inj} . OHC_{inj} is calculated by reference to the proportion that the sum of the

maintenance components for all **connection assets** for all **points of injection** bears to total maintenance costs of **AC assets** as follows:

$$OHC_{inj} = OHC_{AC} \times \frac{MC_{inj}}{MC_{AC}}$$

where

OHC_{AC} is the overhead cost component of **Transpower's AC revenue** for the relevant **pricing year**, as determined by Transpower when setting the **AC revenue**

MC_{inj} is the sum of the maintenance cost of the **connection assets** for all **points of injection** in the preceding **financial year**, as determined by **Transpower** and recorded in **Transpower's** Maintenance Management System accounts for that **financial year**

MC_{AC} is the sum of the maintenance cost of the **AC assets** in the preceding **financial year**, as determined by **Transpower** and recorded in **Transpower's** Maintenance Management System accounts for that **financial year**.

Compare: Electricity Governance Rules 2003 clause 4.19 schedule F5 part F

23 Injection Overhead Rate

The injection overhead rate used to calculate the injection overhead component of the **connection** charge is referred to as **IOR**. **IOR** is calculated by dividing OHC_{inj} by the sum of the proportion of the **replacement cost** of each **connection asset connecting injection customer** assets at all **points of injection** to the **interconnection assets** as follows:

$$IOR = \frac{OHC_{inj}}{\sum_{conn\ inj} RC_{conn\ inj} \times CA_{conn\ inj}}$$

where

$RC_{conn\ inj}$ is the **replacement cost** of a **connection asset connecting injection customer assets** at a point of injection to the **interconnection assets**

$CA_{conn\ inj}$ is the **customer allocation** of the relevant **connection asset** for the relevant **injection customer** at the relevant **connection location**

$\sum_{conn\ inj} RC_{conn\ inj} \times CA_{conn\ inj}$ is the sum of all amounts calculated as $RC_{conn\ inj} \times CA_{conn\ inj}$ for all **injection customers' connection assets** for all **points of injection**.

Compare: Electricity Governance Rules 2003 clause 4.20 schedule F5 part F

Schedule 12.4, clause 23: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

24 Injection Overhead Component

The injection overhead component of the **connection** charge is calculated for a **connection asset** for a **point of injection** by multiplying the **IOR** by the **replacement cost** of that **connection asset** for which the **connection** charge is being calculated as follows:

$$IO_{\text{conn}} = \text{IOR} \times RC_{\text{conn inj}}$$

Compare: Electricity Governance Rules 2003 clause 4.21 schedule F5 part F
Schedule 12.4, clause 24: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

25 Customer Allocation

- (1) Each **customer** at a **connection location** is allocated a proportion (expressed as a percentage) of each **connection asset** for that **connection location**. This percentage is referred to as the **customer allocation** for that **connection asset** at that **connection location**. The **customer allocation** is calculated in accordance with subclause (2). If a **customer** is both an **offtake customer** and an **injection customer** at a **connection location**, a **customer allocation** for each **connection asset** for that **connection location** will be calculated for that **customer** as both an **offtake customer** and as an **injection customer**.
- (2) The **customer allocation** is calculated as follows:
 - (a) for a **connection asset** which connects only 1 **connection location** to **interconnection assets**, except for a **connection asset** of the kind referred to in clause (6)(1)(b)(ii), the **customer allocation** is the proportion that the **customer's anytime maximum demand** or **anytime maximum injection** (as the case may be) at that **connection location** bears to the sum of all **customers' anytime maximum demands** and **anytime maximum injections** at that **connection location**:
 - (b) for a **connection asset** which connects more than 1 **connection location** to **interconnection assets**, except for a **connection asset** of the kind referred to in clause (6)(1)(b)(ii), the **customer allocation** is the proportion that the **customer's anytime maximum demand** or **anytime maximum injection** (as the case may be) at that **connection location** bears to the sum of all **customers' anytime maximum demands** and **anytime maximum injections** at all **connection locations** for that **connection asset**:
 - (c) for a **connection asset** of the kind referred in clause (6)(1)(b)(ii), the **customer allocation** is the proportion that the **customer's anytime maximum demand** or **anytime maximum injection** (as the case may be) at the **connection location** bears to the total capacity of that **connection asset**, as specified in a **Transpower** asset register.
- (3) The following table illustrates the calculation of an **offtake customer's annual connection** charge at a particular **connection location**. It lists all **connection assets** for that **connection location** and the proportion of the **connection** charge for each of those **connection assets** (including the amount of each of the asset, maintenance, and

operating components of the **connection** charge) included in the **annual connection charge** together with the **customer allocation** for the relevant **connection asset**). The column headed "Recovery" is provided for information only and indicates whether the asset, maintenance and operating components (respectively) are recovered under this **transmission pricing methodology (TPM)** or under a **new investment contract (NIC)**.

Connection charge report											
2007 - Connection Charge Components											
Customer		Southern Electric									
Substation:		Johnsto		Load Type:		OF					
Asse	Asset	Physical Location	Recover			Asse Value	Asse t Component	Maintenance Component	Operating Component	Customer Allocation	Connection Charge
			A	M	O						
					\$	\$	\$	\$	%	\$	
LIN	JTN-PVL		TPM -			4,513,794	393,151	187,603	0	4.27	24,798
LAND/BLDG	JTN	JTN	TPM -			1,343,443	117,014	14,106	0	100.00	131,120
TRA	T1	JTN	NIC -			694,012	0	7,287	0	100.00	7,287
SWIT	1	JTN	TPM -TPM-			113,644	9,898	1,193	1,104	100.00	12,195
SWIT	2	JTN	TPM -TPM-			113,664	9,898	1,193	1,104	100.00	12,195
SWIT	3	JTN	NIC -TPM-			113,664	0	1,193	1,104	100.00	2,297
SWIT	92	PV	TPM -TPM-			344,087	29,970	3,613	2,208	100.00	35,791
Annual Connection Charge										225,683	

Example figures only

Compare: Electricity Governance Rules 2003 clauses 4.22 to 4.24 schedule F5 part F
Schedule 12.4, clause 25(3): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

26 Exceptions to the Application of the Connection Charge

- (1) If a **connection asset** is provided by **Transpower** under a **new investment contract**, in which the capital costs of that **connection asset** are recovered, calculation of the **connection charge** for that **connection asset** for the **customer** who is a party to that **new investment contract** (irrespective of when that agreement was entered into) is as follows:
 - (a) for the purposes of calculating the **connection charge** for that **connection asset** under clause 8(1), the asset component A_{conn} is \$0. Recovery of the amount that would otherwise be recovered as the asset component for that **connection asset** is determined by, and recovered under, the **new investment contract**, in accordance with the provisions of the **new investment contract**;
 - (b) the maintenance component and operating component of the **connection charge** are calculated as per clauses 15, 17, and 20; and
 - (c) if the **connection asset** connects more than 1 **connection location** or it connects a **connection location** at which there is more than 1 **customer**, the **customer allocation** is determined in accordance with the relevant **new investment contract**, rather than in accordance with clause 25(2) of this **transmission pricing methodology**.
- (2) If **Transpower** has entered into a prudent discount agreement in which it is agreed that notional **connection assets** that form part of the **alternative project** specified in the prudent discount agreement substitute for **connection assets** at a **connection location**, then for the purposes of clause 8(1) the **customer's customer allocation** for the **connection assets** so substituted is deemed to be 0.

- (3) If a **customer** is **connected** at a **connection location** subject to an **input connection contract**, the following apply:
- (a) those assets that the **customer** uses to **connect** at that **connection location** will not be included in the calculation of the total **connection charge** for that **connection location**;
 - (b) the **customer** will be charged in accordance with the terms of the applicable **input connection contract**.

Compare: Electricity Governance Rules 2003 clauses 4.25 to 4.27 schedule F5 part F
Schedule 12.4, clause 26: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Interconnection Charge

27 Interconnection Charge

The purpose of the interconnection charge is to recover the remainder of **Transpower's AC revenue** that is not recovered via **connection charges**. **Monthly interconnection charges** are paid by **offtake customers** in respect of each **connection location** at which they have **assets connected** to the **grid**. An **annual interconnection charge** is calculated for each **customer** at a **connection location** in accordance with clauses 28 to 30. A **customer's monthly interconnection charge** at that **connection location** is $\frac{1}{12}$ of the **annual interconnection charge**, subject to clause 34 of this **transmission pricing methodology**.

Compare: Electricity Governance Rules 2003 clause 5.1 schedule F5 part F
Schedule 12.4, clause 27: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

28 Interconnection Revenue

The portion of **AC revenue** to be recovered by interconnection charges is calculated as the difference between **Transpower's AC revenue** and the amounts recovered by the **connection charges** for that **pricing year** as follows:

$$R_{IC} = \text{AC revenue} - \sum \text{connection charges}$$

where

AC revenue is **Transpower's AC revenue** for the relevant **pricing year**

\sum connection charges is the sum of all **connection charges** calculated for the relevant **pricing year**.

Compare: Electricity Governance Rules 2003 clause 5.2 schedule F5 part F
Schedule 12.4, clause 28: amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

29 Interconnection Rate

The interconnection rate used to determine the **annual interconnection charge** is referred to as **IR** and is the same for all **offtake customers** at all **connection locations** in all **regions**. The **IR** is calculated by dividing the interconnection revenue by the sum

of the average of the **RCPDs** for each **customer** at a **connection location** for all **customers** at all **connection locations** for all **regions** as follows:

$$IR = \frac{R_{IC}}{\sum_{\text{regions}} \sum_{\text{cust}} \sum_{\text{loc}} \frac{1}{N_{\text{reg}}} \sum_{i=1}^{N_{\text{reg}}} RCPD_i}$$

where

R_{IC} is the interconnection revenue calculated in accordance with clause 28

$\sum_{\text{regions}} \sum_{\text{cust}} \sum_{\text{loc}} \frac{1}{N_{\text{reg}}} \sum_{i=1}^{N_{\text{reg}}} RCPD_i$ is the sum of the average **RCPDs** for each **customer** at a **connection location** for all **customers** at all **connection locations** for all **regions**.

Compare: Electricity Governance Rules 2003 clause 5.3 schedule F5 part F

30 Calculating the Interconnection Charge

An **annual interconnection charge** is calculated for each **offtake customer** at a **connection location** by multiplying the interconnection rate by the sum of the **customer's RCPD** at a **connection location** as follows:

$$\text{interconnection charge} = IR \times \frac{1}{N_{\text{reg}}} \sum_{i=1}^{N_{\text{reg}}} RCPD_i$$

where

IR is IR

$\frac{1}{N_{\text{reg}}} \sum_{i=1}^{N_{\text{reg}}} RCPD_i$ the average **RCPD** for the **offtake customer** in respect of whom the interconnection charge is being calculated at the relevant **connection locations**.

Compare: Electricity Governance Rules 2003 clause 5.4 schedule F5 part F

HVDC charge

31 HVDC Charge

The purpose of the HVDC charge is to recover **Transpower's HVDC revenue**. HVDC charges are paid by all **HVDC customers**. An **annual HVDC charge** is calculated for each **HVDC customer** at each **South Island generation connection location**. The **monthly HVDC charge** is $\frac{1}{12}$ of the **annual HVDC charge** subject to clause 34 of this **transmission pricing methodology**.

Compare: Electricity Governance Rules 2003 clause 6.1 schedule F5 part F

32 HVDC Rate

[Revoked]

Compare: Electricity Governance Rules 2003 clause 6.2 schedule F5 part F

Schedule 12.4, clause 32: revoked, on 1 April 2017, by clause 7 of the Electricity Industry Participation Code

Amendment (Transmission Pricing) 2015.

33 Calculating the HVDC charge

The **annual HVDC charge** is calculated for each **HVDC customer** at each **South Island generation connection location** as follows:

$$\text{HVDC charge} = (\text{DCR}_{\text{SIMI}} \times \text{SIMI}) + (\text{DCR}_{\text{HAMI}} \times \text{HAMI})$$

where

DCR_{SIMI} is the **SIMI-based rate** calculated in accordance with clause 33A, in \$/MWh

SIMI is the **South Island mean injection** for the **HVDC customer** at the **South Island generation connection location** calculated in accordance with clause 33B, in MWh

DCR_{HAMI} is the **HAMI-based rate** calculated in accordance with clause 33C, in \$/kW

HAMI is the **historical anytime maximum injection** for the **HVDC customer** at the **South Island generation connection location** as calculated in accordance with clause 33D, in kW.

Compare: Electricity Governance Rules 2003 clause 6.3 schedule F5 part F
Schedule 12.4, clause 33: replaced, on 1 April 2017, by clause 8 of the Electricity Industry Participation Code Amendment (Transmission Pricing) 2015.

33A SIMI-based rate

The **SIMI-based rate** is calculated for each **pricing year** by dividing **HVDC revenue** by the sum of the **SIMI** of all **HVDC customers** at all **South Island generation connection locations**, as follows:

$$\text{DCR}_{\text{SIMI}} = \left(\frac{i}{4}\right) \frac{R_{\text{HVDC}}}{\sum \text{SIMI}}$$

Where

DCR_{SIMI} is the **SIMI-based rate** for the relevant **pricing year**, in \$/MWh

I	for the pricing year 2017/18	$i=1$
	for the pricing year 2018/19	$i=2$
	for the pricing year 2019/20	$i=3$
	for each subsequent pricing year	$i=4$

R_{HVDC} is **HVDC revenue** for the relevant **pricing year**, in dollars

$\sum \text{SIMI}$ is the sum of the **SIMI** of all **HVDC customers** at all **South Island generation connection locations** for the relevant **pricing year**, in MWh.

Schedule 12.4, clause 33A: inserted, on 1 April 2017, by clause 8 of the Electricity Industry Participation Code Amendment (Transmission Pricing) 2015.

33B Calculation of South Island mean injection

South Island mean injection or **SIMI** is calculated for each **HVDC customer** at each **South Island generation connection location** for a **pricing year**, and is the average of the total **injection** from the **HVDC customer's assets** at the **South Island generation connection location** in the **capacity measurement period** for the **pricing year** and the **capacity measurement periods** for previous **pricing years**, as follows:

$$\text{SIMI} = \frac{\sum \text{injection}}{1 + p}$$

Where

SIMI is the **HVDC customer's South Island mean injection** for the relevant **pricing year**, in **MWh**

$\sum \text{injection}$ is the total **injection** from the **HVDC customer's assets** at the **South Island generation connection location** in the **capacity measurement period** for the **pricing year** for which **SIMI** is being calculated and the **capacity measurement periods** for the p immediately preceding **pricing years**, in **MWh**

P	for the pricing year 2017/18	$p=0$
	for the pricing year 2018/19	$p=1$
	for the pricing year 2019/20	$p=2$
	for the pricing year 2020/21	$p=3$
	for each subsequent pricing year	$p=4$.

Schedule 12.4, clause 33B: inserted, on 1 April 2017, by clause 8 of the Electricity Industry Participation Code Amendment (Transmission Pricing) 2015.

33C HAMI-based rate

The **HAMI-based rate** is calculated for each **pricing year** by dividing **HVDC revenue** by the sum of the **HAMI** for all **HVDC customers** at all **South Island generation connection locations** for the relevant **pricing year**, as follows:

$$\text{DCR}_{\text{HAMI}} = \left(\frac{4-i}{4}\right) \frac{R_{\text{HVDC}}}{\sum \text{HAMI}}$$

Where

DCR_{HAMI} is the **HAMI-based rate** for the relevant **pricing year**, in **\$/kW**

I	for the pricing year 2017/18	$i=1$
	for the pricing year 2018/19	$i=2$
	for the pricing year 2019/20	$i=3$

for each subsequent **pricing year** $i=4$

R_{HVDC} is **HVDC revenue** for the relevant **pricing year**, in dollars

$\sum \text{HAMI}$ is the sum of the **HAMI** of all **HVDC customers** at all **South Island generation connection locations** for the relevant **pricing year**, in kW.

Schedule 12.4, clause 33C: inserted, on 1 April 2017, by clause 8 of the Electricity Industry Participation Code Amendment (Transmission Pricing) 2015.

33D Calculation of historical anytime maximum injection

Historical anytime maximum injection or **HAMI** is calculated for each **HVDC customer** at each **South Island generation connection location** for a **pricing year**, and is—

- (a) for the **pricing year** 2017/18, the greater of the following:
 - (i) the average of the **customer's** 12 highest **injections** at the **connection location** during the **pricing year** 2013/14:
 - (ii) the average of the **customer's** 12 highest **injections** at the **connection location** during the **pricing year** 2014/15:
 - (iii) the average of the **customer's** 12 highest **injections** at the **connection location** during the period commencing on 1 April 2015 and ending with the close of 31 August 2015:
 - (iv) the average of the **customer's** 12 highest **injections** at the **connection location** during the **capacity measurement period** for the **pricing year** 2016/17; and
- (b) for the pricing year 2018/19, the greater of the following:
 - (i) the average of the **customer's** 12 highest **injections** at the **connection location** during the **pricing year** 2014/15:
 - (ii) the average of the **customer's** 12 highest **injections** at the **connection location** during the period commencing on 1 April 2015 and ending with the close of 31 August 2015:
 - (iii) the average of the **customer's** 12 highest **injections** at the **connection location** during the **capacity measurement period** for the **pricing year** 2016/17; and
- (c) for the pricing year 2019/20, the greater of the following:
 - (i) the average of the **customer's** 12 highest **injections** at the **connection location** during the period commencing on 1 April 2015 and ending with the close of 31 August 2015:
 - (ii) the average of the **customer's** 12 highest **injections** at the **connection location** during the **capacity measurement period** for the **pricing year** 2016/17.

Schedule 12.4, clause 33D: inserted, on 1 April 2017, by clause 8 of the Electricity Industry Participation Code Amendment (Transmission Pricing) 2015.

34 Adjustments to AMD, AMI, HAMI, SIMI and RCPD and calculation of customer charges

(1) Before the start of a **pricing year**, and otherwise during a **pricing year** as provided in this clause, **Transpower** will calculate—

- (a) **AMD AMI, HAMI, SIMI and RCPD** quantities (for each **regional peak demand period**); and
- (b) **annual charges**; and
- (c) **monthly charges**—

in each case for every **customer** at every **connection location** for that **pricing year**.

When a **monthly charge** is recalculated for part of a **pricing year**, all inputs used in the calculation will be the same as those used to calculate that **monthly charge** before the start of the **pricing year** except for the adjustments specifically provided in this clause.

(2) If, when calculating **AMD, AMI, HAMI, SIMI and RCPD** quantities before the start of a **pricing year**, **Transpower**, in its sole discretion, considers that exceptional operating circumstances during the relevant **capacity measurement period(s)** have resulted in—

- (a) abnormal **regional demand** resulting in an exceptional **regional peak demand period** for that **pricing year**; and/or
- (b) distortions to a **customer's AMD, AMI, HAMI, SIMI** and/or any **RCPD** quantity at a **connection location** for that **pricing year**—

Transpower may, but is under no obligation to—

- (c) determine that the exceptional **regional peak demand period** is to be ignored when assessing the **regional peak demand periods** for that **pricing year**; and/or
- (d) adjust the **customer's AMD, AMI, HAMI, SIMI** and/or any **RCPD** for the quantity at the relevant **connection location** to minimise the impact of such distortion, as assessed by **Transpower** acting reasonably but otherwise in its sole discretion, as applicable. Such adjusted **AMD, AMI, HAMI, SIMI and RCPD** qualities, as the case may be, shall be used to calculate **monthly charges** for that **customer** for that **connection location** for that **pricing year**.

(3) If **Transpower**—

- (a) is advised that **South Island generation** at a **connection location** has been permanently de-rated (including decommissioning) to a specified aggregate rate capacity (“maximum de-rated capacity”); and
- (b) is satisfied that such **South Island generation** has been so permanently de-rated,—

then, for the purposes of calculating a **customer's HAMI and SIMI** at the relevant **connection location** for any **pricing year** that commences not less than 6 months after the date on which **Transpower** is satisfied under paragraph (b), any **injection** at that **connection location** in any **half-hour** period up to the date on which **Transpower** is satisfied under paragraph (b) which:

- (c) is used to determine the **customer's HAMI and SIMI**; and
 - (d) exceeds the maximum de-rated capacity,—
- will be deemed to be equal to the maximum de-rated capacity.

- (4) If not less than 6 months before the start of a **pricing year**, **Transpower**—
- (a) is advised that the **offtake** and/or **injection** capacity of a **customer's assets** at a **connection location** has been permanently de-rated (including decommissioning); and
 - (b) is satisfied that the **offtake** and/or **injection** capacity of such **assets** has been so permanently de-rated—
- then, for the purpose of calculating the **customer's AMD, AMI** and/or **RCPD** quantities at that **connection location** for any **pricing year** that commences not less than 6 months after the date on which **Transpower** is satisfied under paragraph (b),—
- (c) **Transpower** will estimate (acting reasonably but otherwise in its sole discretion) the **customer's** likely future **offtake** or **injection** (as the case may be) at that **connection location**, having regard to the change in the **customer's offtake** and/or **injection**; and
 - (d) **injection** or **offtake** quantities for any **half-hour** period up to the date on which **Transpower** is satisfied under paragraph (b) which—
 - (i) are used to determine the **customer's AMD, AMI** or **RCPD** quantities; and
 - (ii) exceed **Transpower's** estimate under paragraph (c),—will be deemed to be no more than the amounts estimated by **Transpower** under paragraph (c).
- (5) If—
- (a) **Transpower** decommissions a **connection location**; or
 - (b) a **customer** causes all of its **assets connected** to the grid at a **connection location** to be, and **Transpower** is satisfied that the **customer's assets** have been, permanently disconnected from the **grid** at that **connection location**,—
- then—
- (c) the **customer's monthly charges** for the month in which the **connection location** is decommissioned, will be pro-rated for the number of days that the **connection location** was decommissioned or **assets** were disconnected and the **monthly charges** will be reduced accordingly; and
 - (d) from the month following the month in which such decommissioning or disconnection occurred, the **customer's AMD, AMI, HAMI, SIMI** and all **RCPD** quantities at that **connection location** and the **customer's monthly charges** at that **connection location** will be deemed to be 0.
- (6) If a **customer** connects **assets** to the **grid** at a **connection location** where that **customer** does not already have **assets connected** to the **grid** (including a **new connection location**), the following applies:
- (a) **Transpower** will agree with the **customer** whether the **customer** is to be an **offtake customer** or an **injection customer** at the relevant **connection location** and the **customer** will, until such time as the **assets** have been **connected** for a full **capacity measurement period**, be deemed to be an **offtake customer** and/or an **injection customer** accordingly;
 - (b) if the **asset** is a **generating unit** or **generating station** located in the South Island, the **generating unit** or **generation station** will be deemed to be **South Island generation**:

- (c) **Transpower** will assign the **new connection location** to a **region** (unless it is an existing **connection location**):
 - (d) from the time of **connection** of the **assets** until such time as the **assets** have been **connected** to the **grid** for the whole of the **capacity measurement period** for a **pricing year**, or, in the case of assets which are deemed to be **South Island generation** under paragraph (b), have been **connected** to the grid for 5 consecutive **capacity measurement periods**, the **customer's AMD, AMI, HAMI, SIMI and RCPD** quantities at the **connection location** will be determined using **Transpower's** estimates of the customer's likely offtake and/or injection at the **connection location** for that period:
 - (e) the **customer** will pay **monthly charges** at the **connection location** from the date the **customer's assets** are **connected** to the **grid**. If the **customer's assets** are **connected** part way through a month, the **monthly charges** for that month will be reduced by an amount, being a pro-rata proportion of the **monthly charges** for the number of days in the month that the **customer's assets** were not **connected**.
- (7) If—
- (a) a **customer's connection** of new **assets** at a **connection location** to which subclause (5) applies, (the “**first connection location**”) is a direct consequence of that **customer's** de-rating of **assets** at another **connection location**, (the “**second connection location**”) without the **customer** terminating the second **connection location** as a **point of connection** under any relevant **transmission agreement**; and
 - (b) the **connection assets** for the second **connection location** are shared with any other **customer**,—
- then—
- (c) **Transpower** will estimate (acting reasonably but otherwise in its sole discretion) the **customer's** likely **offtake** or **injection** at the second **connection location** from the date on which the new **assets** are **connected** at the first **connection location** (“**load transfer date**”) until those assets have been **connected** to the **grid** for the whole of a **capacity measurement period** for a **pricing year**; and
 - (d) the **customer's monthly connection charges** at the second **connection location** will be recalculated from the load transfer date. When recalculating the **customer's monthly connection charges** from the load transfer date, any **injection** and/or **offtake** prior to the load transfer date used to calculate the **customer's AMD** and/or **AMI** at the second **connection location** will be capped at **Transpower's** estimates in accordance with subclause (6)(a); and
 - (e) if the load transfer date occurs part way through a month, the **customer's monthly connection charges** at the second **connection location** for that month will be the sum of:
 - (i) a pro-rata proportion of the **customer's monthly connection charges** at the second **connection location** immediately before the load transfer date, based on the number of days in the month prior to the load transfer date; and
 - (ii) a pro-rata proportion of the **customer's** monthly **connection charges** at the second **connection location** recalculated in accordance with

- subclause (6)(e), based on the number of days in the month including and subsequent to the load transfer date.
- (8) If **Transpower** enhances or upgrades **connection assets** for a **connection location** under a **new investment contract** with a **customer** (a “NIC customer”), excluding NIC customers to whom subclause (5) applies,—
- (a) if the enhancement or upgrade is commissioned part way through a **pricing year**, **monthly connection charges** at that **connection location** for the NIC customer will be recalculated from the date the enhanced or upgraded **connection assets** are commissioned to take into account those enhanced or upgraded **connection assets**; and
- (b) if the **connection asset** enhancement or upgrade is commissioned part way through a month, the NIC **customer’s monthly connection charge** for that month will be the recalculated **monthly connection charge** reduced by an amount, being a pro-rata proportion of the recalculated **monthly connection charge** for the number of days in the month before commissioning of the enhancement or upgrade.
- (9) If under this clause, **Transpower** estimates a **customer’s** likely **offtake** or **injection** over any period, **Transpower** may, but is not obliged to, review its estimate from time to time, but not more frequently than at 3 monthly intervals. If **Transpower** revises its estimate, the **customer’s**—
- (a) **AMD, AMI, HAMI, SIMI** and **RCPD** quantities; and
- (b) **monthly charges**—
- will be recalculated accordingly and such recalculated **monthly charges** will be payable upon **Transpower** giving such notice as required in the relevant **transmission agreement** with the **customer**.
- (10) If subclauses (6), (7) or (8) apply, or **Transpower** revises any estimate and **monthly grid charges** under subclause (9), there will be a wash-up and reconciliation at the end of the relevant **pricing year** of—
- (a) **monthly connection charges** paid by—
- (i) all **customers** at the **connection location**; and
- (ii) all other **customers** at **connection locations** which share the same **connection assets**; and
- (b) **monthly HVDC charges** paid by all **HVDC customers**,—
- in each case, in that **pricing year** as follows:
- (c) in the case of **monthly connection charges**, the wash-up and reconciliation is to be undertaken in respect of all charges calculated in accordance with clause 8(1) for each shared **connection asset**—
- (i) using **AMD** or **AMI** for each **customer** as at the last day of the **pricing year** (including any **Transpower** estimate); and
- (ii) so that the sum of the percentage proportions allocated to **customers** in accordance with clause 25(1) does not exceed 100% for any **connection asset** and so that **Transpower**, in turn, does not recover, in aggregate, more than 100% of the sum of the asset, maintenance, operating and overhead

- cost components calculated in accordance with clauses 8 to 26 for any **connection asset**:
- (d) in the case of **monthly HVDC charges**, the wash-up and reconciliation is to be undertaken—
 - (i) using **HAMI** and **SIMI** for each **HVDC customer** as at the last day of the **pricing year**; and
 - (ii) so that the sum of all **monthly HVDC charges** paid by the **HVDC customer** for that **pricing year** does not exceed the **HVDC revenue** for that **pricing year**:
 - (e) **Transpower** will issue a credit note for any overpayment by a **customer** consequent upon the wash-up.
- (11) If a prudent discount agreement commences part way through a **pricing year**, **Transpower** will recalculate the **customer's monthly charges** at the relevant **connection location(s)** consistently with the prudent discount agreement from the date the prudent discount agreement takes effect until it terminates or otherwise ceases to apply. If the prudent discount agreement commences part way through a month, the customer's **monthly charges** for that month will be the sum of—
- (a) a pro-rata proportion of the **monthly charges** calculated in accordance with this **transmission pricing methodology** being the proportionate number of days in the month before the commencement of the prudent discount agreement; and
 - (b) a pro-rata proportion of the **monthly charges** calculated in accordance with the prudent discount agreement being the proportionate number of days in the month on and from commencement of the prudent discount agreement.
- (12) **Transpower** must adjust a **customer's AMD, AMI, HAMI, SIMI, or RCPD** at a **connection location** to minimise the impact of **reverse flow** at the **connection location** if—
- (a) the **customer** has an agreement with the **system operator** under clause 6 of Technical Code A of Schedule 8.3; and
 - (b) within 20 **business days** after the **reverse flow** commences at the **connection location**, the **customer** has advised **Transpower** that there is **reverse flow** at the **connection location**; and
 - (c) **Transpower** agrees that there is **reverse flow** at the **connection location**.
- (13) If **Transpower** makes an adjustment under subclause (12), **Transpower** must, no later than 20 **business days** after making the adjustment, make available on its website the reasons for the adjustment, and how the adjustment was calculated.
- (14) **Transpower** is not required to calculate **HAMI** quantities under this clause for any **pricing year** after the **pricing year 2019/20**.

Compare: Electricity Governance Rules 2003 clause 7 schedule F5 part F

Schedule 12.4, clause 34 Heading: amended, on 1 April 2017, by clause 9(1) of the Electricity Industry Participation Code Amendment (Transmission Pricing) 2015.

Schedule 12.4, clause 34(1) to (10): amended, on 1 April 2017, by clause 9(2) to (4) of the Electricity Industry Participation Code Amendment (Transmission Pricing) 2015.

Schedule 12.4, clause 34(3)(a), (4)(a) and (12)(b): amended, on 1 November 2018, by clause 81(a) to (c) of the Electricity Industry Participation Code Amendment (Code Review Programme) 2018.

Schedule 12.4, clause 34(5), (6) and (7): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Schedule 12.4, clause 34(12), (13) and (14): inserted, on 1 April 2017, by clause 9(5) of the Electricity Industry Participation Code Amendment (Transmission Pricing) 2015.

Transmission alternatives

35 Transmission Alternatives

- (1) Charges for **transmission alternative** services will apply when **transmission alternative** services are provided and/or funded by **Transpower**. **Transmission alternative** services are services which substitute for the services provided by **connection assets** or **interconnection assets** or both.
- (2) If a **transmission alternative** service substitutes for a service which would otherwise be provided by **connection assets**, a charge recovering **Transpower's** costs of funding that **transmission alternative** service is added to the **connection** charge(s) of the **customer(s)** for the relevant **connection location(s)**. The costs of the **transmission alternative** service are allocated between all **customers** at the relevant **connection locations(s)** in the same proportion that each **customer's** total **connection** charges for the relevant **connection location(s)** bears to the sum of all **customers' connection** charges for those **connection location(s)**.
- (3) If a **transmission alternative** service substitutes for services which would otherwise be provided by **interconnection assets** a charge recovering the cost of the **transmission alternative service** is allocated between **offtake customers** in the same proportion that each **offtake customer's** interconnection charges bears to the sum of all **offtake customers' interconnection** charges.
- (4) If a **transmission alternative** service substitutes for both **connection assets** and **interconnection assets**, the allocation of the costs of the **transmission alternative service** as between **connection assets** and **interconnection assets** must be calculated in accordance with clause 25(2) for shared **connection assets** at an **interconnection node**.
- (5) The costs of funding **transmission alternative** services will be charged to, and payable by, **customers** in the month following the month in which **Transpower** is invoiced for those costs.

Compare: Electricity Governance Rules 2003 clause 8 schedule F5 part F

Schedule 12.4, clause 35(2): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Schedule 12.4, clause 35(4): amended, on 5 October 2017, by clause 325 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Prudent Discount Policy

36 Purpose of the Prudent Discount Policy

- (1) The purpose of the prudent discount policy is to help ensure that the **transmission pricing methodology** does not provide incentives for the uneconomic bypass of existing **grid assets**. The prudent discount policy aims to deter investment in **alternative projects** which would allow a **customer** to reduce its own transmission charges while increasing the total economic costs to the nation as a whole.

- (2) In order for a **customer** to obtain a prudent discount a **customer's alternative project** must be—
- (a) technically, operationally and commercially viable and have a reasonable prospect of being able to be successfully implemented; and
 - (b) uneconomic to implement given **Transpower's** economic costs of providing existing **grid assets** and the economic costs that would be incurred by the customer if it proceeded with the **alternative project**,—
- determined in accordance with this prudent discount policy.

Compare: Electricity Governance Rules 2003 clauses 9.1 and 9.2 schedule F5 part F

37 Information Required in a Prudent Discount Application

- (1) In order for an **alternative project** to be accepted by **Transpower** as a prudent discount application it must be developed to a level of detail equivalent to the detail that a prudent company Board would reasonably expect when considering an investment proposal.
- (2) If a **customer** wishes to apply for a prudent discount, that **customer** must (at its own expense) submit to **Transpower** a written proposal describing the **alternative project** and the likely impact of that **alternative project** on that **customer's** transmission charges.
- (3) The proposal must, to the extent relevant, contain all of the information described in Appendix C, together with any other information which is likely to be relevant to **Transpower's** consideration of the **alternative project**.
- (4) Without limiting subclause (3) **Transpower** may require the **customer** to provide any additional information which **Transpower** considers is reasonably necessary to enable it to conduct its assessment of the **alternative project** in accordance with clauses 38 and 39.

Compare: Electricity Governance Rules 2003 clauses 9.3 to 9.6 schedule F5 part F

38 Assessment of Technical, Operational and Commercial Viability of Alternative Project

- (1) **Transpower** will, within a reasonable time of receiving the proposal, assess the **alternative project** to determine whether or not—
- (a) it is technically feasible; and
 - (b) it is operationally feasible and compliant with the **asset owner performance obligations** and **technical codes**, and any other relevant requirements as set out in Part 8 of this Code; and
 - (c) the **alternative project** could reasonably be expected to provide the **customer** with transmission charges that would result in a lower overall commercial cost having regard to the capital, operating, maintenance and all other costs likely to be incurred by the **customer** as a result of undertaking the **alternative project** to the **customer** than the current **Transpower** charges, for the same or a similar level of service.
- (2) In undertaking its assessment of the **alternative project**, **Transpower** may adjust any of the information provided by the **customer** to reflect **Transpower's** reasonable

assessment of current market prices, good engineering practice and any consequential impacts of the **alternative project** on the **grid assets** and the **customer's** assets.

Compare: Electricity Governance Rules 2003 clauses 9.7 and 9.8 schedule F5 part F

39 Assessment that the Alternative Project is Uneconomic

- (1) If **Transpower** considers that the **alternative project** does not satisfy one or more of the criteria specified in clause 38(1), no prudent discount will be provided.
- (2) If **Transpower** considers that the **alternative project** satisfies all of the criteria specified in clause 38(1), **Transpower** will, within a reasonable time thereafter, assess the **alternative project** to determine whether or not it is uneconomic in accordance with subclauses (3) to (7).
- (3) **Transpower** will calculate the present value of the estimated total costs of the **alternative project** including capital costs and operating and maintenance costs. **Transpower** may use the cost estimates provided by the **customer** or may reasonably adjust those costs to reflect current market prices, good engineering practice and consequential impacts of the **alternative project** on **grid assets** and the **customer's** assets.
- (4) The discount rate used to undertake the calculations required by subclauses (3) to (7) must be a discount rate determined by the **Authority**, from time to time, or if the **Authority** has not determined a discount rate, a discount rate of, or equivalent to, a pre-tax real rate of 7%. The calculations required by subclauses (3) to (7) will be carried out using a period of 15 years or the remaining life of the **grid assets** which the **alternative project** would bypass, whichever is the lesser.
- (5) **Transpower** will then calculate the present values of—
 - (a) **Transpower's** costs of continuing to provide transmission services to the **customer** if the **alternative project** does not proceed, including operating and maintenance costs and planned future capital expenditure needed to maintain required service levels; and
 - (b) **Transpower's** costs of continuing to provide transmission services to the **customer** if the **alternative project** does proceed, including operating and maintenance costs and planned future capital expenditure needed to maintain required service levels.
- (6) If the amount calculated under subclause (5)(a) minus the amount calculated under subclause (5)(b) is greater than the amount calculated under subclause (3), the **alternative project** will be determined to be economic and no discount will be provided.
- (7) If the amount calculated under subclause (5)(a) minus the amount calculated under subclause (5)(b) is less than the amount calculated under subclause (3), the **alternative project** will be determined to be uneconomic.

Compare: Electricity Governance Rules 2003 clauses 9.9 to 9.15 schedule F5 part F

40 Independent Review

- (1) The **customer** may, within 60 days of being advised of **Transpower's** decision to offer a prudent discount agreement or that no discount will be provided, request a review by

an **independent expert** of any or all of the assessments undertaken by **Transpower** for the purposes of that decision.

- (2) Within a reasonable time of being appointed, the **independent expert** is to report his or her findings to **Transpower** and the **customer**. The findings of the **independent expert** will be binding on **Transpower** and the **customer**. If the **independent expert** finds that the **customer's alternative project** is uneconomic and satisfies all the requirements of clause 38(1), the provisions of clause 41(1) will apply.
- (3) The costs of the **independent expert** are to be met by the party requesting the review if the information or assessments reviewed are confirmed as reasonable; otherwise the costs will be met by the other party.

Compare: Electricity Governance Rules 2003 clauses 9.16 to 9.18 schedule F5 part F
Schedule 12.4, clause 40(1): amended, on 1 November 2018, by clause 81 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2018.

41 Prudent Discount Agreement

- (1) If the **customer's alternative project** is considered by **Transpower** to be uneconomic and to satisfy all the requirements of clause 38(1), **Transpower** will offer a prudent discount agreement to all **customers** that are directly affected by the proposal. The prudent discount agreement will provide for—
 - (a) the **customer** to pay to **Transpower** an annuity (the amount of which is to be specified in the prudent discount agreement) determined by reference to the **customer's** cost of funding, maintaining and operating the **alternative project** over the duration of the prudent discount agreement, applying a commercial discount rate; and
 - (b) **Transpower** to calculate the **customer's** transmission charges in accordance with this **transmission pricing methodology** as if the **alternative project** had been implemented.
- (2) The commencement date of a prudent discount agreement will take full account of the time that would reasonably be required for the **customer** to implement the **alternative project**.
- (3) The duration of a prudent discount agreement will be the lesser of the remaining economic life of the **grid assets** that are affected by the agreement, or 15 years.

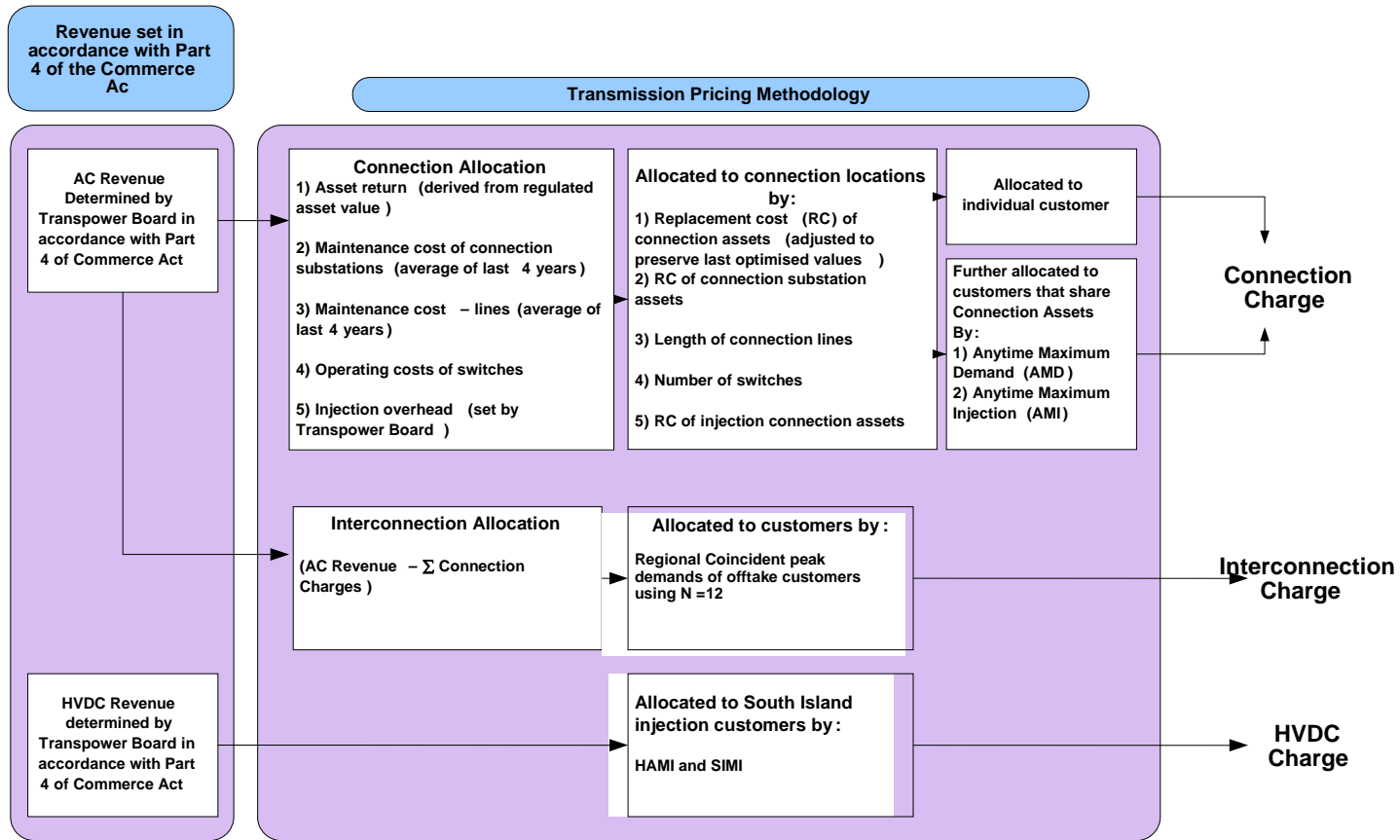
Compare: Electricity Governance Rules 2003 clauses 9.19 to 9.21 schedule F5 part F

42 Prudent Discount Details to be Published

- (1) As soon as reasonably practicable after concluding a prudent discount agreement with a **customer**, **Transpower** must **publish** the decision made, the analysis supporting that decision and the following information:
 - (a) the cost estimate used by **Transpower** in assessing the **alternative project** and the calculations undertaken by **Transpower** using those cost estimates;
 - (b) any report prepared by an **independent expert**;
 - (c) the annual amount payable by the **customer** under clause 41(1)(a);
 - (d) details of how the **customer's** transmission charges will be calculated under clause 41(1)(b).

Compare: Electricity Governance Rules 2003 clause 9.22 schedule F5 part F
Schedule 12.4, clause 42(1): amended, on 5 October 2017, by clause 326 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2017.

Appendix A– Allocation of Transpower’s AC Revenue and HVDC Revenue to its



Compare: Electricity Governance Rules 2003 appendix A schedule F5 part F
Schedule 12.4, Appendix A: amended, on 1 April 2017, by clause 10(1) and (2) of the Electricity Industry Participation Code Amendment (Transmission Pricing) 2015.

Appendix B Regions

North Island

- (a) Upper North Island (UNI): all **connection locations** on, or north and west of, a line—
 - (i) commencing at 38°02'S and 174°42'E; then
 - (ii) proceeding in a generally north-easterly direction directly to 37°36'S and 175°27'E; then
 - (iii) proceeding north along the 175°27'E line of longitude.
- (b) Lower North Island (LNI): all **connection locations** south and east of the line described in paragraph (a).

South Island

- (a) Upper South Island (USI): all **connection locations** on, or north of, a line passing through 43°30'S and 169°30'E, and 44°40'S and 171°12'E.
- (b) Lower South Island (LSI): all **connection locations** south of the line described in paragraph (a).
Compare: Electricity Governance Rules 2003 appendix B schedule F5 part F
Schedule 12.4 Appendix B: replaced, on 1 April 2017, by clause 11 of the Electricity Industry Participation Code Amendment (Transmission Pricing) 2017.

Appendix C

Information Required to Support a Prudent Discount Application

General information

1. Location of the **alternative project**.
2. A brief description of the **alternative project**.
3. A sketch or schematic of the **alternative project**.

Part A: Information required to enable a technical evaluation of the proposal

- (1) A report on the technical viability of the **alternative project**, provided by either the **customer**, or an external consultant on behalf of the **customer**. The report must include details of voltage quality, especially if there are switched capacitors and/or switched loads, such as motor starting, and information on the size of load, the size of any capacitors, the frequency of switching and the size of voltage steps.
- (2) A circuit diagram.
- (3) For a **customer** who operates a distribution network, a diagram of the **customer's** distribution network that is sufficiently detailed to run load-flow models. The network diagram should contain load distribution data, circuit parameters and the parameters of any embedded generation.
- (4) A description of how the requirement for any additional physical space will be met. (When attaching to existing equipment, or to an existing facility, there may be a need for physical space for new equipment, e.g. a new circuit breaker bay or a **connection point** to a generator bus.)
- (5) The following information, except if it is not applicable to the **alternative project**:
 - Voltage (kV)
 - Demand (peak MW/low MW)
 - Conductor rating and type
 - Circuit length (km) and type (single or double)
 - Voltage support type and rating (VARs)
 - Estimated losses (MW/km)
 - Transformers: size (VA) and impedance (Ω)

Part B: Cost of the alternative project

The following information is required to enable independent validation of the **customer's** cost estimates. This information must be provided, except if it does not apply to the **alternative project**.

Capital cost (line)

- (1) Conductor type, capital cost per metre, distance in metres and total estimated cost.
- (2) Type of structures (poles or lattice towers), number of structures, capital cost per structure and total estimated cost.
- (3) Type and number of insulators, capital cost per insulator and total estimated cost.
- (4) The capital cost of line fittings.

- (5) Any other capital costs of lines.

Capital cost (substation)

- (1) The type and number of transformers, the capital cost per unit and the total estimated cost.
- (2) The type and number of circuit breakers, the capital cost per unit and the total estimated cost.
- (3) The type and number of disconnectors, the capital cost per unit and the total estimated cost.
- (4) The type of protection and metering, the capital cost per unit and the total estimated cost.
- (5) The type and capital cost of buswork.
- (6) The type and capital cost of other infrastructure.
- (7) Any other miscellaneous substation costs.

Labour cost

- (1) Estimated labour costs.
- (2) Estimated design and project management costs.

Cost of system losses

The estimated cost of the electrical line losses that would result if the alternative were implemented, specifically:

- Estimated additional losses in MW/km.
- Estimated additional losses per annum in MWh.
- The estimated average price of energy in \$/MWh.
- Total estimated value of additional electrical losses per annum in dollars.

The cost of easements and consents

- (1) A topographical map of the line route in sufficient detail to verify estimates of the costs of easements and consents, or to verify that easements and consents are not required.
- (2) An estimate of consent costs.
- (3) An estimate of easements costs.
- (4) Estimate of property right costs.

Part C: Commercial evaluation

An analysis by the **customer** that provides a prima facie demonstration that the proposed **alternative project** would provide the **customer** with **Transpower** charges that would result in a lower overall commercial cost to the **customer** than the current **Transpower** charges, for the same or a similar level of service.

Part D: Legal matters

The implementation of some **alternative project** proposals will require the **customer** to enter into contractual agreements with third parties and to satisfy statutory requirements. In this

case, the **customer** must provide reasonable evidence that the **alternative project** would be able to be successfully implemented, including but not limited to—

- (1) a report from appropriately qualified planning, legal and property consultants that demonstrates that all consents required to implement the **alternative project** are either held, or are reasonably likely to be obtained; and
- (2) evidence of access, easement and other property rights required to implement the **alternative project**.

Compare: Electricity Governance Rules 2003 appendix C schedule F5 part F

Part A(4): amended, on 23 February 2015, by clause 75 of the Electricity Industry Participation Code Amendment (Distributed Generation) 2014.

Part B(5): amended, on 1 February 2016, by clause 63 of the Electricity Industry Participation Code Amendment (Code Review Programme) 2015.

Schedule 12.5
Availability and reliability index measures

cls 12.119 and 120

Asset type	Asset category	Planned unavailability	Unplanned unavailability	Number of planned interruptions	Planned unserved energy MWh	Number of unplanned interruptions	Unplanned unserved energy MWh	
Interconnection transformer branches	220/110 kV interconnecting transformers and associated equipment	1.56%	0.06%	0.03	0.10	0.02	0.72	
	220/066 kV interconnecting transformers and associated equipment	0.66%	0.02%	0.00	0.00	0.00	0.00	
	110/066 kV interconnecting transformers and associated equipment	2.25%	0.02%	0.00	0.00	0.00	0.00	
Interconnection circuit branches	220 kV interconnection circuit branches and associated line end equipment	0.88%	0.05%	0.00	0.00	0.13	9.87	
	110 kV interconnection circuit branches and associated line end equipment	1.67%	0.07%	0.08	0.50	0.28	10.45	
	66 kV interconnection circuit branches and associated line end equipment	1.25%	0.08%	0.14	0.46	1.31	1.88	
Shunt assets	Capacitor banks and associated equipment	High (220kV-66kV)	0.81%	1.33%	0.00	0.00	0.02	0.03
		Low (33kV-11kV)	0.81%	1.33%	0.00	0.00	0.02	0.03

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Asset type	Asset category	Planned unavailability	Unplanned unavailability	Number of planned interruptions	Planned unserved energy MWh	Number of unplanned interruptions	Unplanned unserved energy MWh
	Reactors and associated equipment	1.33%	0.31%	0.00	0.00	0.00	0.00
	Synchronous condensers and associated equipment	2.00%	1.00%	0.00	0.00	0.00	0.00
	Static var compensators and associated equipment	0.82%	0.04%	0.00	0.00	0.00	0.00
	Filter banks and associated equipment	1.03%	1.71%	0.00	0.00	0.00	0.00
HVDC Link Pole 2	One category including associated equipment	1.27%	0.51%	0.00	0.00	0.20	0.85

Compare: Electricity Governance Rules 2003 schedule F6A part F