# NZX Market Operator

## New Participant Welcome Pack

NZX

ELECTRICITY AUTHORITY
TE MANA HIKO

# Content



## Disclaimer

**This information booklet identifies and generally describes the steps required to interact with the NZX market operations services under the Electricity Industry Participation Code 2010 (Code). This information booklet does not form part of the Code. It is provided for general information only. It is not as legal advice and does not establish any legal obligation.**

**Although NZX has taken every care in the preparation of the content of this information paper, NZX and the Electricity Authority offers no warranty (express or implied) as to the accuracy, completeness, or legality of that content. The Electricity Authority is not liable or responsible to any persons for direct or indirect loss or damage that may result from the action or failure to act by any person in reliance on this information booklet.**

**The publishing of this information booklet does not place any obligation on NZX as a market operations service provider or the Electricity Authority to follow any interpretation contained in it when carrying out any of its functions under the Electricity Industry Act 2010 (Act).**

**The Code places many obligations on a retailer and should be consulted in full by intending retailers. Some of those obligations are contained in this booklet, however many obligations may be specific to the type of activity a retailer wishes to trade on. NZX suggests if you are in doubt that you do ask.**

# Introduction

**NZX is a specialist provider of services to the New Zealand electricity market and has been providing these services for over 20 years.**

NZX provides key market operation services, network billing services, stress testing for risk exposure reporting, hydro data, customised data provision and expert analysis. Within 2021 NZX also became the operator for the ETS Carbon Auction platforms as commissioned by the Ministry for the Environment.

NZX Energy is a market operation service provider contracted by the Electricity Authority (EA). Using expert knowledge and proprietary systems, we enable the 24/7 trading through the WITS manager, as well as the clearing and reconciliation of the spot market electricity through the reconciliation manager and clearing manager roles. NZX carries out these activities in accordance with the Electricity Industry Participant Code 2010 (Code) and various Functional and Non-functional requirements agreed with the Electricity Authority.

We work collaboratively with the EA, system operator (Transpower), FTR manager (Energy Market Services), registry manager (Jade Software Corporation Limited), all energy retailers, generators, network distributors and those participants trading FTRs or contract for difference hedging facilitated through the clearing manager.

For more information the services NZX provides to the energy market, please visit [www.NZX.com](http://www.NZX.com)

**Having Feedback?**
NZX is always looking for ways to innovate and improve our systems and processes. We value the opinions and ideas of electricity participants, so if you have any feedback, please send it through

# Important Dates

**Energy participants have monthly obligations to the electricity market.**

| | |
|---|---|
| RM: Publishes outage constraints | BD2 16:00 |
| CM: Previous month's hedge settlement amounts sent to participants from CM | BD3 |
| RM: Participant's initial reconciliation volume due to the RM | BD4 16:00 |
| CM: Publishes wash-up notifications | BD5 |
| RM: Publishes initial volume reports | BD7 16:00 |
| CM: Publishes invoices to settle previous month | BD9 |
| RM: Participant's wash-up reconciliation volume due to the RM | BD13 16:00 |
| CM: Participant's settlement amount must be received by CM<br>CM: Settlement payments made to participants | 20th of the month<br>13:00 (or next BD)<br>16:00 |
| RM: Publishes wash-up reconciled volume reports | LBD 12:00 |
| CM: Wholesale electricity prices published to WITS<br>CM: Participants made prudential payments to CM | Daily 12:00<br>Daily 16:00 |

**MONTH YEAR**

| S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|
| 28 | 29 | 30 | 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 | 31 | 1 |
| 2 | 3 | 4 | 5 | 6 | 7 | 8 |

RM: Reconciliation manager
CM: Clearing manager
LBD: Last Business Day

# Entering New Zealand's Electricity Market

**To enter the New Zealand wholesale electricity market a participant must complete the following process.**

### 1 Register with the Electricity Authority (EA).

- Participants in the electricity industry must supply information such as area of activity and contact details to the EA.
- Details on how to register with the EA can be found here.
- Advise the Authority you want to know how to enter the market (marketoperations@ea.govt.nz).

### 2 Apply to Electricity Authority for a participant identifier.

- After registration, participants need to apply for a unique 4-character code from the EA.
- The participant identifier application form can be found on the EA website here.

### 3 Complete NZX participant and contact forms.

Participants must provide information including banking and contact details to the clearing manager.

### 4 Fulfil Anti Money Laundering compliance requirements.

Participants are required to comply with requests to allow the clearing manager to complete due diligence checks, required by legislation. This may include supplying proof of identification (passports).

### 5 Meet with NZX Energy Operations.

Before becoming a participant, you are invited to meet with the NZX Energy Operations team. We will support you through the onboarding process.

### 6 Receive relevant system access.

For a participant to gain their system access, they must complete and return the relevant use of system forms provided by NZX Energy Operations team.

### 7 Provide estimated usage data.

- Participants who are intending to purchase electricity must supply an estimation of purchase and/or generation quantities by GXP to the clearing manager.
- The clearing manager uses the estimates to calculate the minimum amount of initial prudential security required.

### 8 Organise appropriate prudential and security arrangements.

- The clearing manager must receive the appropriate prudential and security arrangements estimated in step 7, to cover the first month's trading obligations.
- This includes 'Letter of Credit' and/or 'Security Deed'.

### 9 Understand and comply with code obligations processes.

It is crucial for participants to understand all their obligations to the market, including those found in the Electricity Industry Participation Code 2010.

### 10 Receive market start date.

- Once all the above requirements have been met, you will be provided with the date you are able to start trading in the electricity market.
- If you are going to be a retailer there are additional steps regarding the registry. The Authority will advise when you contact them at step 1 above.

### Additional information

More information on the electricity market can be found here: www.ea.govt.nz

# Wholesale Information Trading System

**The Wholesale Information Trading System (WITS) provides a near real-time view; it is the authoritative source of up-to-date, accurate information and trading functionality for the market.**

The WITS manager facilitates the bidding and offering of spot market electricity.

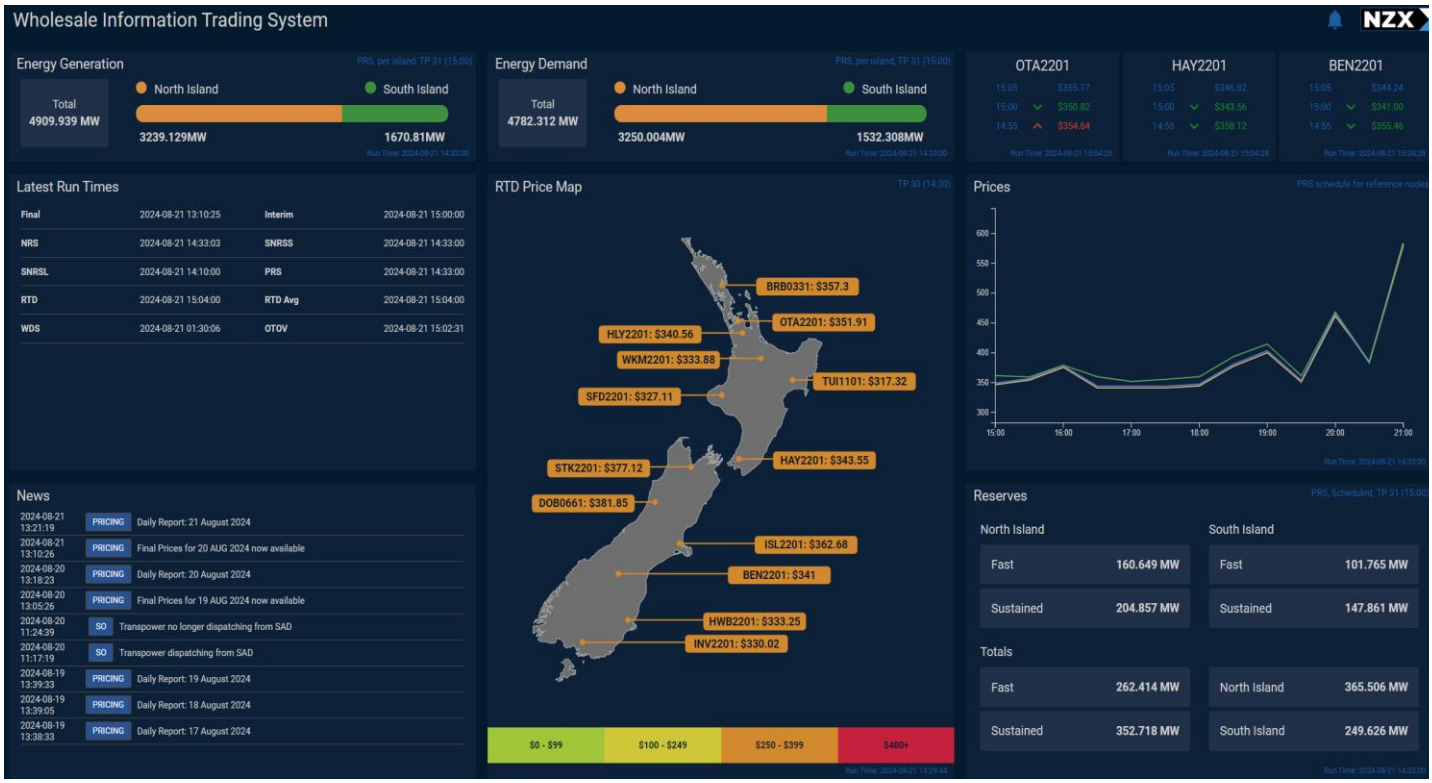
The Wholesale Information and Trading System:

- Is used by participants to upload their bids and offers for the wholesale electricity market.
- Sends these bids and offers to the System Operator for dispatch and validation.

24/7 Access to WITS, allows purchasers and generators to enter bids and offers for energy, and publishes them every 5 minutes.

WITS data comes from a range of sources:

- Scheduling data from the system operator.
- Constraints, block settlement differences, and Must Run Dispatch Auction (MRDA) information from the clearing manager.
- Bids and offers from traders.




**How to get access?**

WITS data can be accessed through the following sites:

- www.electricityinfo.co.nz- public website.
- www1/www2.electricitywits.co.nz - Trading platform for wholesale market participants.
- WITS API (prices and quantities) – www.developer.electricityinfo.co.nz/WITS/register
- SFTP access are available on request.

For more information email wits@nzx.com

# Real-time Pricing

**As of April 2023, New Zealand's electricity market is now operating on real-time pricing (RTP). This provides participants and consumers more accurate and timely pricing information with 5-minute real time dispatch prices being used to calculate and immediately publish interim prices on at the end of each 30-minute trading period.**

Previously, interim prices were not calculated and published until the following calendar day with prices not being finalised for at least two days after the trading period. The new process under RTP enables participants to make efficient real-time decisions about their electricity consumption and generation.

The clearing manager has now taken over the duties and responsibilities of the previously disestablished pricing manager role validating calculation and publishing the final electricity spot prices to WITS. The clearing manager uses the final electricity prices for invoicing and prudential calculations.

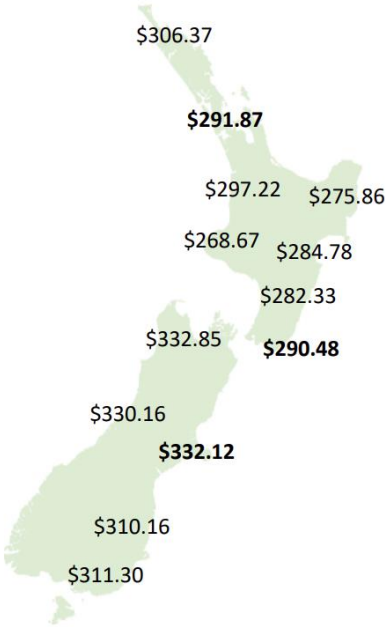
## Pricing Error Claim

Participants can raise a pricing error claim (PEC) with the clearing manager if they believe there is an error with the process that prices have been calculated. The form and process to submit a PEC can be found here.

Under clause 13.169, participants must raise a PEC before 1200 on the 1st business day after prices are made interim on WITS.

A pricing error is defined as:
pricing error means an error in an interim price or interim reserve price as a result of—

i. a dispatch price or dispatch reserve price that was not made available on WITS being used to calculate the interim price or interim reserve price; or
ii. the clearing manager having followed an incorrect process in calculating that interim price or interim reserve price, in contravention of this Code.




*Snapshot of energy prices around New Zealand*

## Calculating Interim Prices

Interim prices for a 30-minute trading period are calculated using a time weighted average of real time dispatch prices.

Please find an interim price worked example below:

| GIP/GXP | TP | Market Time | RTD Price | Run Time | Time (Mins) | Weighted-Average (Time) | Weighted-Average (Price) | Interim Price |
|---|---|---|---|---|---|---|---|---|
| BEN2201 | 3 | 1:00 | 425.27 | 12:59:55 am | 4.62 | 15.40% | 65.49 | |
| BEN2201 | 3 | 1:05 | 427.93 | 1:04:37 am | 5.00 | 16.67% | 71.32 | |
| BEN2201 | 3 | 1:10 | 427.94 | 1:09:37 am | 5.05 | 16.83% | 72.04 | |
| BEN2201 | 3 | 1:15 | 438.68 | 1:14:40 am | 8.58 | 28.60% | 125.46 | |
| BEN2201 | 3 | 1:20 | 417.33 | 1:23:15 am | 1.33 | 4.43% | 18.50 | |
| BEN2201 | 3 | 1:25 | 414.76 | 1:24:35 am | 5.42 | 18.07% | 74.93 | |
| | | | | **Total** | **30.00** | | **Total** | **427.75** |

**How to get access?**
Pricing information can be accessed through WITS. There is also a free **Daily Wholesale Market Report** which summarises key electricity market metrics covering price, demand, supply, transmission, and climate.

Email cm@nzx.com to subscribe to the distribution list.

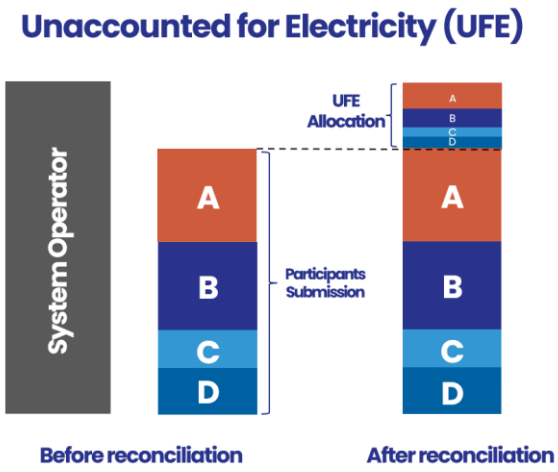
# Reconciliation Manager

**The reconciliation manager balances participant volume submissions with actual usage provided by the Grid and Network Owners, ensuring that all volume is distributed accurately amongst those trading within a specific area.**

The locations and volume of electricity that is generated or consumed constantly changes. Therefore, all electricity must be reconciled against what the grid owner measures on a half hourly period basis (with non-half hourly submissions being profiled into half hourly trading periods). The reconciled volumes are used by the clearing manager, in conjunction with final prices to create settlement invoices for participants.

Volume submitted by participants is reconciled against the grid meter volume at an NSP level in a balancing area. Distributors must notify the reconciliation manager of any new or changed balancing areas or NSPs. The NSP mapping table is held in the RM system and is provided daily to the Registry.

There is a regular revision (washup) process to submit more accurate data as it becomes available.




Participants' submissions do not always match what the system operator reports has been used at the grid. This leads to UFE that gets allocated amongst participants based on their market share in that balancing area

## Volume Dispute

Reconciliation participants who have received their reconciled volumes and believe them to be incorrect may raise a volume dispute. Our preference is for participants to use the wash up revision process to revise their submission.

A participant can submit a dispute from business day 5 until the clearing manager generates invoices on business day 9.

To submit a volume dispute, please log it through the portal and follow up with an email to the reconciliation manager.

Participants must submit their initial volumes for the previous consumption month by 1600 on business day 4 under clause 15.4(1), and their revised wash-up volumes for the previous consumption period, as well as revision data for 3, 7 and 14 periods ago by 1600 on business day 13 under clause 15.4(2).

The reconciliation web portal contains further explanatory information including file names and file formats documents and system user guide. UAT sites are also available, and we recommend participants to check their file submissions using the file checker tool.

### How to get access?

To gain access to the reconciliation portal, please contact the reconciliation manager. Once the reconciliation manager has a contact email and confirmation from the EA, you will have a reconciliation portal profile created. Reconciliation uploads and downloads can also be completed via SFTP on request.

For more information email rm@nzx.com or call +64 4 498 0044

# Reconciliation Changes in Submissions

### Reconciliation Participants have a Code obligation to provide complete and accurate data to the reconciliation manager.

The revision process allows participants to submit more accurate data as it becomes available, however there is a very prescriptive process for doing this. Errors in submissions often occur when incorrectly submitting revised data and will impact other participants through the balancing process.

## Changes in submissions - Zero out previous NSP submissions

When participants wish to remove volumes incorrectly submitted to an NSP in revisions, they must first submit a new file with zeros allocated to the NSP, then submit the changes to that NSP. The reconciliation system stores multiple submissions as differences, and when submissions are changed (for example, the loss code or dedicated flags) without zeroing out the previous submission, the result is additional submission volume (and a higher invoice for you).

**Incorrect submission example**

| POC | Network | Recon Type | Part | Profile code | Loss code | Flow | Dedicate NSP Y/N | Consum month | Current | Previous |
|---|---|---|---|---|---|---|---|---|---|---|
| May 2020 R1 | | | | | | | | | | |
| BRY0661 | ORON | GN | XXXX | RPS | LVL | X | Y | May-20 | 17984.1 | 17984.1 |
| May 2020 R3 | | | | | | | | | | |
| BRY0661 | ORON | GN | XXXX | N0D | LVL | X | Y | May-20 | 17984.1 | 17984.1 |
| Total May 2020 Volumes | | | | | | | | | | |
| BRY0661 | ORON | GN | XXXX | RPS | LVL | X | Y | May-20 | **17984.1** | **17984.1** |
| BRY0661 | ORON | GN | XXXX | N0D | LVL | X | Y | May-20 | 17984.1 | 17984.1 |

In this example, your invoice will be for a total volume that is the sum of the two lines (35,968.2 kWh) effectively doubling your reconciled volume.

**Correct submission example**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| May 2020 R1 | | | | | | | | | | |
| BRY0661 | ORON | GN | XXXX | RPS | LVL | X | Y | May-20 | 17984.1 | 17984.1 |
| May 2020 R3 | | | | | | | | | | |
| BRY0661 | ORON | GN | XXXX | RPS | LVL | X | Y | May-20 | **0** | **0** |
| BRY0661 | ORON | GN | XXXX | N0D | LVL | X | Y | May-20 | 17984.1 | 17984.1 |
| Total May 2020 Volumes | | | | | | | | | | |
| BRY0661 | ORON | GN | XXXX | N0D | LVL | X | Y | May-20 | 17984.1 | 17984.1 |

After correcting the duplicate volume, your reconciled volume will be for the correct amount (17,984.1 kWh).

# Clearing Manager

**The clearing manager invoices energy retailers for their generation, consumption, and market-related costs. Participant's hedges may also be settled through the clearing manager.**

## Invoicing

The clearing manager combines participant's reconciled volumes from the reconciliation manager, with the half-hourly pricing information, to calculate the invoices for each industry participant per node and trading period. This is to ensure generators and market related costs are paid.

The clearing manager will advise the participant of the amount owing for settlement no later than the 9th business day of the month under clause 14.18(2)(a). Participants must pay their invoice amount by the 20th calendar day of the month before 1300 under clause 14.31(1)(a) and the clearing manager must pay amounts owing by 1600 on the 20th calendar day under clause 14.34(1).

Although you get paid for your generation, the clearing manager generates 'buyer created tax invoices' on your behalf.

## Prudential

Participant's security exposure is calculated and held with the clearing manager. The calculation determines risk to generation should a participant default on settlement.

Participants must have the required prudential security in the clearing manager's operating account no later than 1600 on the relevant business day under clause 14A.6(2).

## Invoice Dispute

Clearing participants who have received their invoices and believe them to be incorrect are able to raise an invoice dispute or revise their volumes in the next wash up revision. Our preference is for participants to use the wash up revision process to revise their submission.

Participants can raise an invoice dispute up to 2 years after receiving the invoice under clause 14.25(2)(a).

To submit an invoice dispute, please send a formalised email to the clearing manager (cm@nzx.com).

**42,702 GW**
Annual Electricity Generating Capacity

**$6,399 Million**
Annual Purchased Electricity

*Snapshot from Jan - Dec 2023*

**How to get access?**
The clearing manager publishes invoices to www.electricityclearing.co.nz.
To receive access to the clearing portal, please contact the clearing manager.

For more information email cm@nzx.com or call +64 4 495 2801

# Prudential Statement

**The clearing manager is required to hold the net purchase exposure of each participant in the form of prudential security. This is to maintain market security in case of a purchaser defaulting, as electricity can be consumed up to 50 days before settlement payment is required.**

Sample Prudential Statement (non-FTR participant)

Participant

From

Date issued and date of assessment.

A summary of security held, exposure and amounts available for release. If additional security is required today, this is shown here.

Summary of security held with the clearing manager.

The number of days that make up the total exposure, with detail shown for each item. The amounts include invoiced amounts, or reconciled amounts, or estimates. The best available data is used.

The last three estimates of today's exposure and today's estimate. The lowest of these four amounts is the minimum that must be lodged with the clearing manager.

Estimates for the next three business days, based on the last 7 days change in net exposure.

Reference to the Code clauses that cover this statement.

**Prudential Statement**

Sample Participant #2

NZX

Energy Clearing House Limited
Prudential Statement for 14th May 2014 (assessed at: 27-Nov-2014 09:57AM)

**Prudential Security Position Summary**

| | | |
|---|---|---|
| Total Security Lodged | $4,047.83 | $4,047.83 |
| less Total Exposure (min) | | $1,175.84 |
| Total Security Required | $1,175.84 | |
| Excess/(Deficit) Prudential Security | | $2,871.99 |
| Amount Available for Reduction | $2,871.99 | |

**Security Lodged Summary**

| | |
|---|---|
| Cash - ANZ | $2,023.19 |
| Cash - ASB | $2,024.64 |
| Total Security Lodged | $4,047.83 |

**Exposure Detail (62 Days)**

| Component | Current Exposure 01/04/14 to 13/05/14 | Exit Period Exposure 14/05/14 to 01/06/14 | Total Exposure 01/04/14 to 01/06/14 |
|---|---|---|---|
| Spot Market Purchase | $10,789.61 | $667.06 | $11,456.67 |
| Spot Market Sales | $0.00 | $0.00 | $0.00 |
| Ancillary Services | $22.14 | $9.78 | $31.92 |
| Washup Amounts | $0.00 | $0.00 | $0.00 |
| Hedge Settlement Amounts | $0.00 | $0.00 | $0.00 |
| FTR Amounts | $0.00 | $0.00 | $0.00 |
| Other Amounts | $0.00 | $0.00 | $0.00 |
| GST | $1,621.76 | $101.52 | $1,723.28 |
| Pre Payments | | | <$1,000.00> |
| Total Exposure (Net) | $12,433.51 | $778.36 | $12,211.87 |
| Total Security Required | | | $12,211.87 |

**Previous Exposure Calculation (for 14-May-2014).**

| Date Calculated | Exposure | (Pre)Payments | Net Exposure |
|---|---|---|---|
| 09-May-2014 | $2,167.98 | $0.00 | $2,167.98 |
| 12-May-2014 | $2,180.22 | $0.00 | $2,180.22 |
| 13-May-2014 | $2,175.84 | $1,000.00 | $1,175.84 |
| 14-May-2014 | $13,211.87 | $1,000.00 | $12,211.87 |
| Min. Security Required (calc. 13-May-2014) | $2,175.84 | $1,000.00 | $1,175.84 |

**Forward Exposure Calculation (from 14-May-2014).**

| Date Calculated | Exposure | (Pre)Payments | Net Exposure |
|---|---|---|---|
| 15-May-2014 | $15,442.15 | $1,000.00 | $14,442.15 |
| 16-May-2014 | $17,672.42 | $1,000.00 | $16,672.42 |
| 19-May-2014 | $19,961.46 | $1,000.00 | $18,961.46 |

05/12/2014 12:58:34 This statement is the clearing manager's estimates as required by clause 14A.5 of the Electricity Industry Participation Code 2010. Participants must provide the minimum security required as described by clause 14A.6. Page 1 of 1

**Forms of prudential security:**

- Cash deposit.
- Letter of Credit/Bank Guarantee/Bond.
- Hedge contract lodged with and settled by the clearing manager.

The clearing manager determines the required level of prudential that each electricity purchaser must provide daily, by estimating each purchaser's net exposure over a period of 55-60 days.

A 3-business day forward estimate of security required is provided by the clearing manager each day. If a participant's exposure is more than the current prudential security has already provided a call will be issued for additional security under clause 14A.5(1).

If a participant is on call, they must provide the additional security before 1600 hours that business day under clause 14A.6(2).

## Prudential Withdrawals

Participants may choose to reduce the security they hold with the clearing manager if their lodgement exceeds their exposure amount, as stated in clause 14A.8. Participants may also change the type of security provided after notifying the clearing manager of their intention to do so.
To request a reduction of security, please email the clearing manager who will process it within 24 hours of the request being made, as per clause 14A.10.

Participants can use their prudential balance to pay towards their settlement invoice, but you must specifically instruct the clearing manager at least 2 business days before settlement day, as outlined in clause 14.32(3). You also have the option to make this a standing instruction every month, allowing payments to be automatically used from you cash deposit held by the clearing manager, as specified in clause 14.32(2).

# Prudential Methodology

The clearing manager has developed four methodologies relating to prudential security as set out in the Code:

- under **clause 14.21**, the methodology for determining settlement retention amount (SRA), =
- under **clause 14A.5**, the methodology for determining the forward estimate of the minimum amount for the following three business days,
- under **clause 8 of Schedule 14A.1**, the methodology for determining the general prudential requirement estimate offsetting electricity sales from electricity purchases, and,
- under **clause 12 of Schedule 14A.1**, the methodology for determining the minimum security required in respect of financial transmission rights (FTRs).

Prudential is made up of two key components, volume and pricing.

## Volume


Current exposure volume is determined by a participant's market share (calculated from reconciled volume) × System Operator's actual metered load.

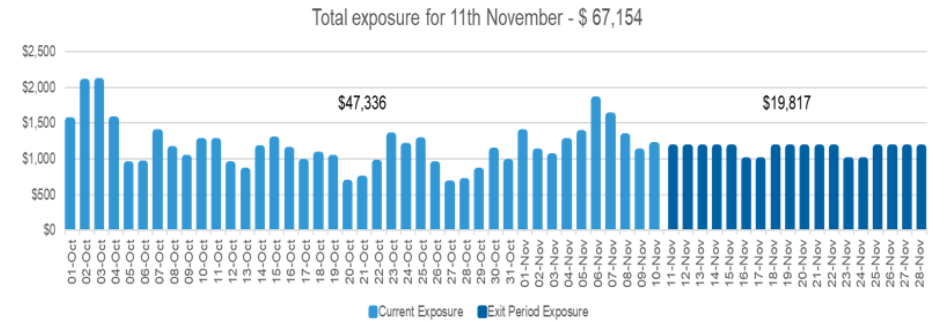
Exit period volume is used to protect the market from a participant defaulting by adding 18 days to their current exposure, calculated by averaging the previous 21 days.

## Pricing


Priority of prices is: Final, Interim and then forecasted (exit period prices).

Exit period prices are published 2 months before the next quarter for the whole quarter.

## Total Exposure




A participant's total prudential exposure is made up by summing the current exposure and the exit period exposure.

# Stress Test Registrar

**NZX is the independent stress test registrar that collects disclosure statements from disclosing participants.**

These statements are used by you to determine your risk exposure to the energy market spot price in specified scenarios. NZX collects these results for upcoming 12 quarters along with actual cover ratio for the previous quarter, anonymises them before the Authority publishes the results as a report. Disclosing participants can review the report and compare their exposure to other participants.

## Stress Test Scenarios

- **E1: Measures exposure to energy shortage events (e.g. sustained high spot prices). Stress case price of electricity is $400/MWh for NI and $500/MWh for SI for an entire quarter for 2025.**
- **EB: Base case for energy tests. Base case price of electricity is $100/MWh.**
- **C1: Simulates conditions possible during a brief but unexpected shortfall in generation capacity at a time of high demand. Stress case price of electricity is $21,000/MWh across 8 peak hours for 1 day.**
- **CB: Base case for energy tests. Base case price of electricity is $100/MWh.**

**Disclaimer – These scenarios are subject to change. For latest information visit Stress tests | Electricity Authority**

### Disclosure statements:

Disclosing participants must apply a set of standard stress tests to their market position and submit a spot price risk disclosure statement quarterly to their Board and NZX as an independent registrar. The results include the scenario's effect on the participant's annual net cash flow from operating activities and the level of shareholders' equity.

These must be submitted via the Stress Test Application at a minimum of 5 business days before the next quarter starts.

### Disclosing participants:

A participant who consumes electricity that is conveyed to them directly from the national grid and/or buys electricity from the clearing manager. This excludes embedded generator which is not a retailer and does not intend to become a retailer during next 3 calendar months or purchases electricity for its own use to maintain services for the embedded generating station.

For each stress test case, the participant must:

- Estimate the value of electricity they expect to buy and sell to the clearing manager,
- Estimate net cash flows from operating activities,
- State whether they have an explicit risk management policy in respect of your exposure to the wholesale market,
- State the target cover ratio for each stress test calculated

### Certificates of spot price risk disclosure statement:

Every participant must annually submit a certificate verifying that the participant's Board has considered the disclosure statements for the certification period.

Each participant's initial certificate must be submitted to the Stress Test Registrar no later than the end of the fourth quarter following the quarter in which the first spot price risk disclosure statement is submitted by the participant.

### Method for calculating cover ratio for upcoming immediate quarter:

**Stress Test E1 formula:** $a - (b - c) \times d_{(S-B)} + (c \times e) - i$

$$Business\ sales\ revenue - (quarterly\ electricity\ use - hedge\ electricty\ use) \times average\ spot\ price_{(Stress-Base)} + (hedge\ electricty\ use \times hedge\ price) - other\ business\ costs$$

**Stress Test C1 formula:** $a - \left(\left(b - c - (b * \frac{8}{2191.5})/2\right) \times f + ((b * \frac{8}{2191.5})/2) \times e) + (c * g)) - k\right) \times d_{(S-B)} + (c * e) - i$

$Business\ sales\ revenue - ((quarterly\ electricity\ use - hedge\ electricty\ use) * average\ spot\ price_{(Stress-Base)}$
$+ (hedge\ electricty\ use * hedge\ price) - other\ business\ costs$

### Method for calculating cover ratio beyond immediate quarter:

**Stress Test E1 and C1 formula:** $\frac{purchased\ risk\ management\ contracts + physical\ resources}{sold\ risk\ management\ contracts + projected\ quarterly\ electricity\ demand}$

### Method for calculating actual cover ratio for the past quarter:

**Stress Test E1 formula:** $\frac{executed\ risk\ management\ contracts + generated\ electricity}{previous\ quarterly\ electricity\ demand}$

**Stress Test C1 formula:** $\frac{executed\ risk\ management\ contracts + electricity\ demand}{previous\ quarterly\ electricity\ generation}$

### How to get access?

Participants submit their quarterly statements via the Stress Test Registrar application: www.electricitysta.co.nz
To receive access, please email stregistrar@nzx.com or call + 64 4 498 0044

# Stress Test Examples

## Scenario E1 the energy stress test

| Energy Shortage (E1) | Units | Base Case | Stress Case | Derivation |
|---|---|---|---|---|
| Business sales revenue | $ | 1,000,000 | 1,000,000 | a |
| Quarterly electricity use | MWh | 20 | 20 | b |
| Hedged electricity use | MWh | 10 | 10 | c |
| Average spot price | $/MWh | 100 | 400 | d |
| Hedge price | $/MWh | 110 | 110 | e |
| Electricity purchased at spot | $ | 1,000 | 4,000 | f =(b-c)*d |
| Electricity purchased under hedge | $ | 1,100 | 1,100 | g=c*e |
| Net electricity costs | $ | 2,100 | 5,100 | h=f+g |
| Other business costs | $ | 900,000 | 900,000 | i |
| Profit/loss | $ | 97,900 | 94,900 | j=a-h-i |
| Increase/decrease in profitability | $ | -3,000 | | stress-base |

## Scenario C1 the capacity stress test

| Energy Shortage (C1) | Units | Base Case | Stress Case | Derivation |
|---|---|---|---|---|
| Business sales revenue | $ | 1,000,000 | 1,000,000 | a |
| Quarterly electricity use | MWh | 20 | 20 | b |
| Hedged electricity use | MWh | 10 | 10 | c |
| Use during capacity shortage | MWh | 0.073 | 0.073 | d=b*8/(hrs per qtr) |
| Average spot price during event | $/MWh | 100 | 21,000 | e |
| Average spot price for rest of quarter | $/MWh | 100 | 100 | f |
| Hedge price | $/MWh | 110 | 110 | g |
| Electricity purchased at spot | $ | 1,000 | 2,858 | h =(b-c-d/2)*f+(d/2)*e |
| Electricity purchased under hedge | $ | 1,100 | 1,100 | i=c*g |
| Net electricity costs | $ | 2,100 | 3,958 | j=h+i |
| Other business costs | $ | 900,000 | 900,000 | k |
| Profit/loss | $ | 97,900 | 96,042 | l=a-j-k |
| Increase/decrease in profitability | $ | -1,858 | | stress-base |

Input | Calculated | **Fixed Value**

# Energy Data

**NZX Energy provides reporting and data services to industry participants and market observers.**


## Hydrological Information and Reports

Premium subscriptions:

- **The Daily Hydrological Summary Report** covers current and historical hydrology patterns of New Zealand's key generation catchments.
- **NZX Energy Hydro** is a database and analysis tool, which provides access to historical hydrological data. It includes real-time and historical (since 1980) information about the water levels in the rivers and lakes, and energy potential from 14 locations spread across New Zealand.

## Wholesale Energy Market Reports

Free subscriptions:

- **NZX Energy Daily Wholesale Market Report** is a free service provided on weekdays summarising key electricity market metrics covering price, demand, supply, transmission, and climate.
- **NZX Energy Weekly Summary** is a free report provided Tuesday providing a high-level summary of energy metrics from the past week.

To gain subscribe to these complimentary reports please contact cm@nzx.com

## Custom Data Request:

NZX Energy provides customised data requests packaged to user specifications covering all functions of the service provider roles it provides. To enquire for a quote, please contact energy.data@nzx.com with details outlining the information you are after.

### How to get access?

NZX Energy Hydro database can be accessed on www.energy.nzx.com.
To register for a premium hydro subscription or a custom data request please email energy.data@nzx.com
To join the complimentary wholesale market report distribution list please email cm@nzx.com

# Compliance

**All participants are required to comply with the electricity rules and regulations outlined under the Electricity Industry Act 2010 and the Electricity Industry Participation Code 2010.**

## The Electricity Industry Participation Code 2010

The Code' sets out the duties and responsibilities that apply to industry participants, service providers and the Authority.

The key sections that relate to the service provider roles NZX performs are:

- Part 13 - Trading Arrangements (clearing manager and stress test registrar)
- Part 14 - Clearing and settlement (clearing manager)
- Part 14A - Prudential requirements (clearing manager)
- Part 15 - Reconciliation (reconciliation manager)

Failing to comply with the rules set out in the Code is considered a breach. NZX Energy is obligated to report all breaches to the Electricity Authority who will determine a resolution to the misconduct. It is recommended for participants to self-report misconduct for failing to comply with The Code, and this will be considered in the breach report.

NZX Energy will also notify the Electricity Authority if we believe a participant is at risk of committing a default situation regarding market security or settlement. Should a participant believe, they will be unable to meet their obligations they should contact the relevant service provider prior to the breaching incident. Support may be able to be provided.

Participants are required to advise the clearing manager if there are likely to be any changes to their activities (e.g. are increasing customer numbers, are entering new areas etc).

## Anti-Money Laundering and Countering Financing of Terrorism Act 2009

The Energy Clearing House (the legal entity NZX uses to perform the clearing manager service) is required to complete AML checks and due diligence set out in the Anti-Money Laundering and Countering Financing of Terrorism Act 2009 administered by the Financial Markets Authority.

New participants must complete the compliance checks prior to commencing trading. The compliance purpose is to assess risk and identify beneficial owners at or above 25%, directors and any authorised persons. Existing participants will be subject to ongoing due diligence and may be approached by the CM to provide additional information.

Key requirements:

- Evidence; certified identification and address
- "Politically exposed persons" questions

Trusts are required to provide documents confirming trustees, beneficiaries and a trust deed extract evidencing source of wealth and income.

# Resources

| Clearing Manager | |
|---|---|
| Telephone | +64 4 495 2801 |
| Email | cm@nzx.com |
| Clearing Portal | www.electricityclearing.co.nz (primary)<br>https://wlg.electricityclearing.co.nz (secondary) |

| Reconciliation Manager | |
|---|---|
| Telephone | +64 4 498 0044 |
| Email | rm@nzx.com |
| Reconciliation Portal | www.electricityreconciliation.co.nz/ (primary)<br>https://wlg.electricityreconciliation.co.nz (secondary) |
| NSP Mapping Table | www.emi.ea.govt.nz/Reports/Wholesale/Data/R_NSPL_DR |

| WITS | |
|---|---|
| Telephone | 0800 699 363749 (0800 NZX Energy) |
| Email | wits@nzx.com |
| WITS Portal | http://www.electricityinfo.co.nz/help (primary)<br>https://www2.electricitywits.co.nz/ (secondary) |

| Stress Test Registrar | |
|---|---|
| Telephone | +64 4 498 0044 |
| Email | stregistrar@nzx.com |
| Stress Test Registrar | www.electricitysta.co.nz |
| Anonymised Results | www.emi.ea.govt.nz/Wholesale/Reports/Tagged/stress-testing |

| Additional Resources | |
|---|---|
| NZX Energy Address: | 11 Cable Street, Level 2, Wellington Central |
| The Code: | www.ea.govt.nz/code-and-compliance/the-code |
| Authority's Newsletter | www.ea.govt.nz/subscribe/ |
| Authority's Market Operation Service Providers | www.ea.govt.nz/industry/mosp/ |
| Hydro Database | www.energy.nzx.com |