

NZX ELECTRICITY PRICE INDICES
METHODOLOGY
NZX Electricity Purchasers' Indicative
Price Index and NZX Electricity
Purchasers' Final Price Index

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1. Description

The NZX Electricity Indices track electricity prices in the New Zealand wholesale electricity market. The indices can be used to monitor movements in wholesale electricity prices and to support settlement of standardized derivatives.

There are two core NZX Electricity Indices – a daily index based on final prices, and a near real time index based on the preceding 24 hours of indicative prices. Both indices are calculated regionally with load weighted prices, and for New Zealand as a whole.

NZX Electricity Purchasers' Final Price Index (NZX FPI)

There is a weighted daily index for the Upper North Island (UNI), Lower North Island (LNI), South Island (SI), and New Zealand (NZ). These indices are calculated daily and are based on 30 minute trading period final prices.

NZX Electricity Purchasers Indicative Price Index (NZX IPI)

There is a weighted index from the preceding 24 hours of indicative prices for the UNI region, LNI region, South Island (SI), and New Zealand (NZ). These indices are calculated for each 30 minute period, based on 5 minute indicative prices.

2. Methodology Overview

2.1. Overview

The NZX Electricity Indices are weighted averages of prices from subsets of Grid Exit Points (GXP) in the New Zealand wholesale electricity market. Weights are reviewed annually and remain fixed across each calendar year.

2.2. GXP inclusion criteria

A GXP is a node on the New Zealand national electricity grid where electricity flows out of the national grid to local networks or direct-connect customers.

The GXPs included in the NZX Electricity Indices and their weights are published through the NZX Index Memo service. The following paragraphs describe how GXPs are selected for inclusion. Market information, such as GXP load, may be subject to change through market processes after the publication of index membership and weights, but the GXPs and weights published through the NZX Index Memo service will determine index calculations.

GXPs with less than 500 MWh of total load during the weighting assessment period are excluded.

Any nodes that were initiated or terminated during the weighting assessment period are excluded.

The Tiwai GXP (TWI2201) is excluded.

GXPs are grouped into the UNI, LNI and SI regions and are ranked in order of total load during the weighting assessment period. The sum of the annual load for these nodes is the indexed annual load for these regions.

The constituent nodes for each region are determined by ranking nodes by order of decreasing annual consumption, and then including the highest annual consumption nodes so that the sum of the annual consumption is not less than 80% of the indexed annual load for that region.

The UNI region is defined to be the area north of Huntly, including Glenbrook, Takanini, Auckland and the Northern Isthmus, excluding Kopu and Waikino. That is, any nodes, for example, in the Coromandel Peninsula are excluded, reflecting the transmission network topology.

The LNI region includes all nodes in the North Island that are not in the UNI region.

The SI region includes all nodes in the South Island.

2.3. Weighting methodology

For each region, the weighting factor for each GXP is equal to the total load at the GXP during the weighting assessment period divided by the total load of all included GXPs in that region during the weighting assessment period.

Weighting is reviewed and adjusted annually at the Annual Index Review.

Weights are derived from annual consumption over the calendar year (1-January to 31 December inclusive) prior to the Annual Index Review.

3. Calculation – NZX Electricity Purchasers’ Final Price Indices

3.1. Source of prices

The official source of prices will be the provisional and final prices published by the pricing manager for the New Zealand wholesale electricity market.

3.2. Index calculation

The daily index values are calculated daily and are equal to the weighted average of the arithmetic mean of the 30 minute trading period prices for the included GXPs. The following rules apply to each index region:

3.3. Unavailability of Final prices

If Final prices are not available for nodes representing a total of less than 20% of the index weight for an index region, the index will be calculated with the available prices using a rescaling of weights so that the index is a weighted average of the available prices.

If Final prices are not available for nodes representing a total of 20% or more of the index weight for an index region, the index will not be published for that day. If prices are subsequently published, the index will be calculated by 12.30pm the day following publication.

Final prices are considered to be unavailable for 'disconnected nodes' which are identified in a given trading period by zero price and zero load.

There are instances when Final prices are published as 'provisional'. In place of legitimate prices, provisional prices can include 'slack variable prices'. In order to exclude these artificial prices, Final prices are also considered unavailable if their absolute value exceeds \$90,000 /MWh. (Also see below.)

3.4. NZ Index value

The index value for New Zealand is determined as the load-weighted average of the regional index values, where the weighting for each region is in proportion to the indexed annual consumption for that region.

3.5. Index availability

These indices will be available by 12.30pm the following day.

3.6. Revisions

If official prices are provisional at 12.00pm on the day of publication, the index will be calculated as above using provisional prices. Electricity market rules specify that final prices will be determined within three days. If an index value is first calculated using provisional prices, it will be updated daily (at 12.30pm) until prices become final.

4. Calculation – NZX Electricity Purchasers' Indicative Price Indices

4.1. Source of prices

The official source of prices will be WITS 5-minute prices, which are published for 5-minute intervals, closely after each 5 minute interval. These prices are indicative prices and are not currently used to settle any spot market transactions.

4.2. Indicative Index Calculation

Indicative price indices are calculated every 30 minutes and are an arithmetic mean of NZX generated 30-minute prices for the trading periods over the preceding 24 hours (inclusive).

For each included GXP, the NZX generated 30-minute price is calculated as a weighted sum of the maximum WITS 5-minute price (80% weight) and the arithmetic mean of all six of the 5-minute prices during that trading period (20% weight). The weights have been determined from matching the resulting index to the final price index from historical prices.

For a given node and trading period, if one of the six 5-minute prices is unavailable, this method is applied using the five available 5-minute prices; if two or more of the six 5-minute prices are unavailable, no NZX generated 30-minute price is calculated. Nodes and trading periods for which no NZX generated 30-minute price is calculated are omitted from the 24 hour averaging.

The indices will be available approximately 10 minutes after the close of each 30 minute trading period.

4.3. Unavailability of 5-minute prices

If 5-minute prices are not available for nodes representing a total of less than 20% of the index by weighting, the index will be calculated with the available prices using a rescaling of weights so that the index is a weighted average of the available prices.

If 5-minute prices are not available for nodes representing a total of 20% or more of the index by weighting, the index will not be published for that trading period.

Indicative 5-minute prices are considered unavailable if:

- they have not been published through the WITS system.
- their absolute value exceeds \$10,000 /MWh. This restriction is designed to exclude 'slack variable prices' due to infeasibilities in the SPD pricing solution.

4.4. NZ Index value

The index value for New Zealand is determined as the load-weighted average of the regional index values, where the weighting for each region is in proportion to the indexed annual consumption for that region.

4.5. Revisions

Index prices are final and are not subject to revision.

5. Annual Index Review

Timetable: An Annual Index Review is conducted each April based on the annual consumption of the previous calendar year. Changes to included GXP's and weightings are published prior to 1 May and are effective in Index calculations from 1 June.

6. Introduction and removal of GXP's

New GXP's:

New GXP's will be added to the indices annually at the Annual Index Review. A GXP will only be included if it was initiated prior to 1 January in the previous year.

Dropped GXP's:

If a GXP ceases to be classified as a GXP, the GXP will be removed from any of the NZX Electricity Indices in which it appears on the day that it ceases to be a GXP. No GXP will be added to replace the removed GXP until the annual index review, so the effective weightings of GXP's remaining in the NZX Electricity Indices will increase through rescaling.

7. Administration

Changes to index constituents or index methodology are usually announced in the NZX Index Memo service, which is available by subscription. When index changes are of general market interest, NZX may also make a Market Announcement and/or press release advising of the change.

The NZX Electricity Indices are administered by NZX, which approves any adjustments to the indices and any changes to the index methodology and procedures. If there is any dispute as to the interpretation of the index methodology and procedures or any matter relating to the NZX Electricity Indices, NZX will resolve such dispute or other matter at its absolute discretion. In the event of discovery of an error in index data or calculation, NZX may, at its sole discretion, publish revised historic data to correct the error, depending on the magnitude and recentness of the error.

Table 1: GXP's used in calculation of Electricity Price Indexes for 1 Jun 09 to 31 May 10

Upper North Island	Lower North Island	South Island
PEN0331	CPK0331	STK0331
PEN1101	HAM0331	ADD0661
GLN0331	KAW0113	BRY0661
ALB0331	KIN0111	INV0331
HEP0331	WHI0111	BLN0331
PAK0331	WTU0331	ISL0331
ALB1101	KAW0112	ISL0661
MNG0331	WIL0331	TIM0111
TAK0331	TKR0331	HWB0331
ROS0221	BPE0331	SDN0331
HEN0331	WHU0331	PAP0111
WIR0331	RDF0331	ASB0331
BRB0331	GFD0331	ADD0111
ROS1101	PRM0331	SPN0331
PEN0221	EDG0331	TMK0331
	CST0331	BRY0111
	TNG0111	OAM0331
	TGA0331	SBK0331
	FHL0331	ASB0661
	GIS0501	FKN0331
	MST0331	HWB0332
	KPU0661	PAP0661
	HIN0331	GOR0331
	MNG1101	BAL0331
	ROT0331	
	MTM0331	
	MLG0331	
	WKO0331	
	CBG0111	
	MHO0331	
	HWA0331	
	TMU0111	
	HAM0111	
	ROT0111	
	WGN0331	
	KWA0111	
	LTN0331	
	UHT0331	