

About datasets

Information paper

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1 Introduction

- 1.1 *This document is a rough and ready draft. Comprehensive documentation about the data available on EMI is being prepared and will be available soon.*
- 1.2 The EMI website has an area called Datasets. It is simply a browser-based mechanism to access a collection of folders on the Authority's FTP server. This paper describes the contents of those folders.
- 1.3 To enable easy identification of the available material and its location, levels of the folder structure beneath the folders are itemised in the table of contents above and are described below.
- 1.4 Users of the EMI website are able to customise a report that enables data to be extracted from our data warehouse. The data can then be downloaded as a CSV file. In addition, we have placed commonly used data on the FTP server from where it can be easily downloaded.
- 1.5 A consistent naming convention has been adopted throughout the Datasets collection. In particular, the ISO 8601 date format of yyyy-mm-dd, or the relevant part thereof, is used. More specifically, the hyphens are omitted when dates are used in folder and file names, but are present when dates are used inside the files. Users should be aware that computer applications such as Microsoft Excel may change the appearance of the dates, depending on how the applications have been configured.
- 1.6 All CSV files will be formatted as lists rather than tables. Users have informed us they prefer this approach, even if it means the files are larger than would otherwise be the case. File sizes will be larger due to the repetition of field values in the indexing columns. Existing CSV files that are structured as tables will be changed to lists as time permits.
- 1.7 Unless explicitly stated otherwise, all prices are in units of \$/MWh.

Direct access and anonymous FTP

- 1.8 Besides accessing the datasets on our FTP server using a web browser, it is also possible to access the FTP server directly using anonymous FTP. This means that scripts can be prepared to automatically download selected files at specified intervals. The address for the FTP server is <ftp://ftp.emi.ea.govt.nz>. No username or password is required when using anonymous FTP, and in most cases, users won't be prompted for one either. But if a prompt is made, simply enter the word anonymous or ftp as the username, and enter your email address or the word guest for the password.

2 Contents of retail folder

Archive

Distributed_generation_reporting_(pre_2013_part_6_changes)

- 2.1 Distributed generation (also known as embedded generation) is generation electrically connected to a local network (e.g. Vector Limited's network) or an embedded network (e.g. a shopping mall). It is not directly connected to the national grid (i.e. Transpower's network).

- 2.2 Distributors were required to report statistics about connections on an annual basis under the previous Part 6 of the Code. Part 6 was revised in 2013 and the connection statistics are now notified directly by distributors in the registry. Distributed generation trends are reported on EMI at www.emi.ea.govt.nz/r/lsnxp.

Disconnections

- 2.3 The Authority has no obligation under the Code to collect data from retailers relating to vulnerable and medically dependent consumers. It does so, however, on a quarterly basis on behalf of the Ministry of Business, Innovation, and Employment (MBIE).
- 2.4 The Authority publishes the total number of disconnections for each retailer (as a percentage of the number of domestic consumers supplied by that retailer).

Market structure

- 2.5 Two datasets describing aspects of the retail market structure are available at this time:
- (a) Market share trends by root NSP
 - (b) Market share trends by network reporting region

Dataset: Market share trends by root NSP
 Source: Registry
 Available from: December 2003
 Frequency: Monthly
 Format: CSV

Table 1: Market share trends by root NSP

Description of fields

Field name	Format	Description
Month ended	yyyy-mm-dd	Date
Region	13 character alphanumeric code	Region code
Participant code	4 character alphabetic code	Abbreviated company name
Entity name	Text	Company name
ICP count	Integer	Number of ICPs
ICP share (%)	Numeric	Percentage of ICPs

Source: Electricity Authority

Dataset: Market share trends by network reporting region
 Source: Registry
 Available from: December 2013
 Frequency: Monthly
 Format: CSV

Table 2: Market share trends by network reporting region

Description of fields

Field name	Format	Description
Month ended	yyyy-mm-dd	Date
Region	13 character alphanumeric code	Region code
Participant code	4 character alphabetic code	Abbreviated company name
Entity name	Text	Company name
ICP count	Integer	Number of ICPs
ICP share (%)	Numeric	Percentage of ICPs

Source: Electricity Authority

3 Contents of wholesale folder

Archive

- 3.1 Discontinued datasets pertaining to the wholesale electricity market are located in this archive folder.

201310_Centralised_dataset

- 3.2 This folder contains the final and complete centralised dataset, as published by the Authority in October 2013.
- 3.3 The centralised dataset was historically published every six months and was distributed on a DVD. Each edition of the centralised dataset was a complete historical record, i.e. it was not the case that each release appended records to the previous release. The final edition published in October 2013 is not available on a DVD. There is a text file in the centralised dataset folder called ReadMe.txt that explains the various datasets to be found in this folder.

Bids_and_offers

- 3.4 A complete record of all (demand) bids and (energy and reserve) offers made by participants into the wholesale electricity market is published in daily CSV files.
- 3.5 Bids and offers are specific to a trading day, trading period and pricing node, but may be submitted by participants at any time. The bids and offers CSV files are published daily and contain all bids or offers pertaining to that day, regardless of when the bid or offer was submitted by the participant.
- 3.6 CSV files for bids and offers prior to November 2013 have been published on a monthly basis.

Bids

- 3.7 Daily CSV files containing demand bids.

Dataset: Bids
Source: Reconciliation manager
Format: CSV

Table 3: Bids

Field name	Format	Description
BID_TYPE_DESCRIPTION	Text	
CURRENT_FLAG	2 character alphabetic code	Y or N
CONFIRMING_BID_TYPE		
BAND		
MW	1 character alphabetic code	
PNODE_NAME	7 character alphanumeric	
PRICE		

Field name	Format	Description
SRC_COMIT_ID		
TRADER		
SUBMISSION_DATE	dd/mm/yyyy	
TRADER_NAME	4 character alphabetic code	Abbreviated trader name
TRADING_DATE	YYYYMMDD	
TRADING_PERIOD	numeric, up to 48 (except on the day daylight saving starts or ends, when it goes only to 46)	Represents a half hour period, with 1 starting at midnight

Source: Electricity Authority

Offers

3.8 Daily CSV files containing offers for energy and reserves.

Dataset: Offers

Source: Reconciliation manager

Format: CSV

Table 4: Offers

Field Name	Format	Description
ORDER_TYPE	4 character alphabetic code	
PNODE_NAME	7 character alphanumeric	
PNODE_TYPE	1 character alphabetic code	
RESERVE_TYPE		
SRC_COMIT_ID		
SUBMISSION_DATE	DD/MM/YYYY	Also includes the time
TRADING_DATE	yyyymmdd	
TRADING_PERIOD	numeric, up to 48 (except on the day daylight saving starts or ends, when it goes only to 46)	Represents a half hour period, with 1 starting at midnight
TRADER	4 character alphabetic code	Abbreviated trader name
MAX_RAMP_UP		
MAX_RAMP_DOWN		

Field Name	Format	Description
PLSR_PERCENT		
MAX_OUTPUT		
BAND		
PRICE		
MW		

Source: Electricity Authority

Final_pricing

- 3.9 Final prices are published by the pricing manager – generally the day after the trading day. All final pricing cases solved by the pricing manager are sent to the Authority and loaded in to the data warehouse. Several sets of data derived from final pricing cases are published by the Authority.
- 3.10 Any pricing case file found in the Final_pricing folder will be a final pricing case – as opposed to one of the many pre-dispatch cases. But the solved prices may not yet be final, as published by pricing manager. The status of final prices can only be interim, provisional or final.

Final_prices

Dataset: Final_pricing

Format: CSV

Table 5: Final_pricing

Field name	Format	Description
Trading_date	Yyyy-mm-dd	
Trading_period	numeric, up to 48 (except on the day daylight saving starts or ends, when it goes only to 46)	Represents a half hour period, with 1 starting at midnight
Node	7 character alphanumeric	
Price	numeric	

Source: Electricity Authority

Binding_constraints

Table 6: Binding_constraints

Field name	Format	Description
Trading_date	Yyyy-mm-dd	

Field name	Format	Description
Trading_period	numeric, up to 48 (except on the day daylight saving starts or ends, when it goes only to 46)	Represents a half hour period, with 1 starting at midnight
Name		
Type		
Component	alphanumeric	
Value (MW)	numeric	
Shadow_price (\$/Mwh)	numeric	
Factor	numeric	

Source: Electricity Authority

Generation_load_and_prices

Format: CSV

Table 7: Generation_load_and_prices

Field name	Format	Description
Date	Yyyy-mm-dd	
Trading_period		
POC	7 character alphanumeric	Point of connection code
Generation	numeric	
Load	numeric	
Price	numeric	

Source: Electricity Authority

GDX

- 3.11 The complete set of inputs required by the vSPD model to solve for final prices at all nodes, for all trading periods of a single day are contained in a single GDX file. The Authority publishes a GDX file in this GDX folder each time a final pricing case is received from the pricing manager.
- 3.12 Individual GDX files for the most recent 30 days are available. The archive folder (within the GDX folder) contains annual zip files with GDX files dating back to 2004.
- 3.13 GDX files for trading days prior to 21 July 2009 may not result in a perfect replication of final prices. This is because the information systems used by the system operator changed on that

day and we have used a number of disparate data sources to retrospectively construct the GDX files for all dates before 21 July 2009.

- 3.14 The naming convention for the daily vSPD GDX files is FP_yyyyymmddx_X.gdx, where:
- FP denotes the file is a final pricing case
 - yyyy denotes the year
 - mm denotes the month
 - dd denotes the day
 - x (literally, only ever a lower case letter x) is an indicator that at least one price from vSPD differs by at least half of one cent from the same price produced by SPD
 - _X is a status indicator where _I denotes interim, IP denotes provisional, and _F denotes final.
- 3.15 For example, FP_20130228_F.gdx contains the input data that enables vSPD to replicate final prices that the pricing manager has published as final, at all nodes for all trading periods on 28 February 2012.

Location_factors

- 3.16 Location factors and average prices are to be published annually by the Authority according to clause 13.221 of the Code. In addition to location factors and average prices, the following information must also be published:
- the list of all nodes at which the pricing manager publishes final prices
 - a corresponding grid zone area for each node
 - a list of nominated zone nodes.
- 3.17 If you have any questions about location factors and average prices, please send an email to Market Operations at marketoperations@ea.govt.nz.

Dataset: **Location_factors**

Source:

Available from:

Frequency:

Format: XLS

Table 8: Location_factors

Field name	Format	Description
GXPCode	7 character alphanumeric	
GXPName	Text	Location name
2002	Numeric	
2003	Numeric	
2004	Numeric	

Field name	Format	Description
2005	Numeric	
2006	Numeric	
2007	Numeric	
2008	Numeric	
2009	Numeric	
2010	Numeric	
2011	Numeric	
2012	Numeric	

Source: Electricity Authority

Raw_case_files

- 3.18 The SPD case files are zipped collections of text files containing the input to and outputs from each and every published final pricing case.

Reserve_prices

Dataset: Reserve prices
Source: Pricing manager
Available from: 1 November 1996 with a gap from April 1997 until March 2004
Frequency: Half-hourly data supplied on a monthly basis
Format: CSV

Table 9: Reserve prices

Description of fields

Field name	Format	Description
Trading_date	yyyy-mm-dd	Date
Trading_period	Integer	Trading period
Island	Text	NI or SI
FIR (\$/MWh)	Numeric	Price of fast instantaneous reserves, \$/MWh
SIR (\$/MWh)	Numeric	Price of sustained instantaneous reserves, \$/MWh

Source: Electricity Authority

Generation

- 3.19 This folder contains generation output data and information about the generation fleet.
- 3.20 Two files are available on a temporary basis until the reports section of EMI website is updated to provide this information on an ongoing basis. The files are:
- (a) 2013_Generation_by_station_by_technology_by_fuel_by_region_by_day_(GWh).csv
 - (b) 201310_to_201401_Generation_by_technology_fuel_and_region_(GWh).xls.
- 3.21 As the names suggest, the CSV file contains daily output (GWh) characterised by plant, technology, fuel and region for all of 2013. The XLS file contains monthly output (GWh) characterised by plant, technology, fuel and region for the period October 2013 through January 2014.

Generation fleet

- 3.22 Information about the existing and proposed generation fleet is compiled by the Authority from publicly available data and is generally updated as the need arises or when new information becomes available to us. We make this information available because we are frequently asked for it and there is evidently a keen interest by a range of stakeholders in such information. Users should be aware that it may contain errors and it may be out of date. Please email emi@ea.govt.nz if you wish to provide additional data enabling us to augment the generation fleet information.

Existing

- 3.23 A file containing information such as plant name, owner, operator, connection type, technology, fuel type, capacity etc is made available. This file is prepared on best endeavours basis and is updated only occasionally. It cannot possibly be accurate as the Authority does not receive such information in any reliable form.

Table 10: Generation plant

Field name	Format	Description
Station_Name		
GroupName		
Owner_Name		
Operators_Name		
Connection_Type		
Generation_Type	Text	Diesel, Gas, Geo, Hydro, Marine, Wind, Cogeneration, Backup generation
Operating_Capacity	numeric	

Field name	Format	Description
Fuel_Type	Text	Hydro, Gas, Geo, Wind, Biogas, Wood_waste. Geothermal. Unknown
Primary_Efficiency	Numeric	
Secondary_Fuel	Text	E.g Fuel_Oil, Gas, Distillate
Secondary_Efficiency	Text	
Date_Commissioned	Text	
Installed_Capacity	numeric	
Max_Unit_Size	numeric plus MW	E.g 17 MW
Typical_Annual_GWh	numreric	
Generating_Units		
Thermal_Operating_Stockpile		
Hydro_Max_m3_Storage	numeric	
Hydro_Max_Gwh_Storage	numeric	
Node_Name		
Region_Name	text	Province
Island_Name	text	SI - South Island, NI - North Island
Comments	text	
Decommission_Date		
Data_Source	text	Name of organisation or website
GroupOrder		
CDSName		

Source: Electricity Authority

Proposed

- 3.24 The proposed generating plant update provides an overview of the status of in-development and proposed generation projects. The updates will be made available at quarterly intervals until such time as they become a report available from the EMI website.

Table 11: Proposed_generating_plant

Field name	Format	Description
Generation type	Text	Diesel, Gas, Geo, Hydro, Marine, Wind
Region	Text	Province
Location / Name of project	Text	
Owned by	Text	
Capacity (Mw)	numeric	
Earliest commission date	Yyyy-yyyy	
Status	text	E.g: Consented, Under construction

Source: Electricity Authority

Generation_MD

- 3.25 The generation_MD dataset depicts generation output by half hour, as computed using metered data as a proxy for generation. The units in all of the monthly generation_MD CSV files are kilowatt hours.
- 3.26 The generation_MD files are structured so that the fuel, technology, and regional mappings can be used to aggregate the data in a variety of ways that suit individual users.
- 3.27 If the data was aggregated according to the 'Gen_Code' field, the resulting generation data should replicate the so-called 'Generation by plant' series that used to be published in the centralised dataset. The CDS was discontinued after 30 September 2013. If you think we've made a mistake and the old CDS generation by plant series cannot be replicated, please let us know by emailing emi@ea.govt.nz.
- 3.28 The CSV files prior to 2009 have been constructed using the old CDS generation by plant data rather than the raw metered data supplied by EMS. For completeness, we have inserted the POC codes and network codes into these files. But we should hasten to add that while the data is correct by site, generator, fuel and technology, some of the POC and network codes may be incorrectly assigned. One day we will untangle the method used to generate the old CDS generation by plant data, and rebuild the pre-2009 CSV files.

Table 12: Generation_MD

Field name	Format	Description
Site_Code	3 character alphabetic	
POC_Code	7 character alphanumeric	Point of connection code
Nwk_Code		

Field name	Format	Description
Gen_Code		
Fuel_Code		Hydro, Gas, Geo, Wind, Wood,
Tech_Code		Hydro, Thrml, Cogen, Geo, Wind
Trading_date	yyyy-mm-dd	
TP1		the first half hour trading period of the day (starting at 12.00am)
TP2 – TP47		
TP48		the last half hour trading period of the day (starting at 11.30pm)

Source: Electricity Authority

Market_Administrator_reports

Annual_consumption_list

- 3.29 The annual consumption list must be published at least once every six months according to clause 13.188(3) of the Code. The list ranks in descending order the annual consumption of all grid exit points and grid injection points with annual consumption greater than 300GWh for the 12-month period ended 3 months prior to the date on which the list is due to be published.
- 3.30 The annual consumption lists located in this folder satisfy the Code obligation as specified in clause 13.188(3). If you have any questions about the annual consumption list, please send an email to Market Operations at marketoperations@ea.govt.nz.

Dataset: **Annual consumption**

Source: NZX

Frequency: Annual

Format: PDF

Table 13: Annual consumption

Field name	Format	Description
POC	7 character alphanumeric	Point of connection code
Nwk Code	4 character alphabetic code	Abbreviated name of company
Flow		

Field name	Format	Description
Consumption (Gwh)		

Source: Electricity Authority

Metered_data

- 3.31 A week or so into each month, the Authority receives from EMS (Transpower) a file of metered grid data pertaining to the preceding month. This data measures injection (grid imports) and offtake (grid exports) on a half hourly basis at a point of connection (POC) on the grid. EMS advises us that this so-called 'GDS' data file is more-or-less the same data that is sent to the reconciliation manager. Technically speaking, the data is neither generation data nor demand, or consumption, data. The Authority has very little visibility of generator's meters.
- 3.32 The metered data is loaded into the Authority's data warehouse, which in turn is programmed to produce the monthly CSV files located in the following folders: Grid_export, Grid_export_to_Tiwai, Grid_import, HVDC_flows, and Reactive_power.
- 3.33 In addition two further sets of data are added to the collection we refer to as metered data:
- Unit level generation for the generating units exceeding 60MW capacity.
 - Embedded generation.
- These two data sets are further described below.
- 3.34 The units in all CSV files found in the metered data collection are kilowatt hours, kWhs, except the reactive power files whose units are kilovolt ampere reactive hours, kVARhs.

Embedded_generation

- 3.35 Embedded generation exceeding 10MW capacity and cleared through the wholesale market is reported in this file.

Table 14: Embedded_generation

Field name	Format	Description
POC	7 character alphanumeric	Point of connection code
NWK_Code	4 character alphabetic code	Network Code.
Participant_Code	4 character alphabetic code	Abbreviated entity name
Loss_Code		
Flow_Direction	1 character alphabetic code	I or X
Trading_Date	DD/MM/YYYY	
TP1 – TP48		Half-hour trading periods of the day (starting at 12.00am)

Source: Electricity Authority

Grid_export

- 3.36 In the metered data files received from EMS, if the unit_measure field is kWh and the flow direction field is 'X', then the record is a measure of grid offtake, or grid export. There may be many traders taking energy off the grid at a single POC so without further knowledge or information, it is not possible to know where the energy is destined to be consumed.

Table 15: Grid_export

Field name	Format	Description
POC	7 character alphanumeric	Point of connection code
NWK_Code	4 character alphabetic code	Network Code.
GENERATION_TYPE	2 character alphabetic code	
TRADER	4 character alphabetic code	
UNIT_MEASURE		
FLOW_DIRECTION	1 character alphabetic code	I or X
STATUS		
TRADING_DATE	DD/MM/YYYY	
TP1 – TP48		Half-hour trading periods of the day (starting at 12.00am)

Source: Electricity Authority

Grid_export_to_Tiwai

- 3.37 The grid export to Tiwai data is, as the name suggests, the grid exports that go to Tiwai. The Tiwai data can also be found in the grid export files (see the TWI2201 POC) – it is extracted and presented separately because analysts are often interested in what is going on at Tiwai.
- 3.38 The only user at the Tiwai POC is Tiwai so in this instance, grid exports to Tiwai are a reasonable representation of demand for electricity by the Tiwai aluminium smelter.

Table 16: Grid_export_to_Tiwai

Field name	Format	Description
POC	7 character alphanumeric	Point of connection code. Will be Tiwai (TWI2201)
NWK_Code	4 character alphabetic code	Network Code.
GENERATION_TYPE	2 character alphabetic code	
TRADER	4 character alphabetic code	

Field name	Format	Description
UNIT_MEASURE		
FLOW_DIRECTION	1 character alphabetic code	I or X
STATUS		
TRADING_DATE	DD/MM/YYYY	
TP1 – TP48		Half-hour trading periods of the day (starting at 12.00am)

Source: Electricity Authority

Grid_import

- 3.39 In the metered data files received from EMS, if the unit_measure field is kWh and the flow direction field is 'I', then the record is a measure of injection into the grid offtake at a POC. If it is known that the only activity at a POC is generation, i.e. there is no load at the POC, then the grid import values can be taken as a reasonable proxy for the output of the generator or generators at the POC.

Table 17: Grid_import

Field name	Format	Description
POC	7 character alphanumeric	Point of connection code
NWK_Code	4 character alphabetic code	Network Code.
GENERATION_TYPE	2 character alphabetic code	
TRADER	4 character alphabetic code	
UNIT_MEASURE		
FLOW_DIRECTION	1 character alphabetic code	I or X
STATUS		
TRADING_DATE	DD/MM/YYYY	
TP1 – TP48		Half-hour trading periods of the day (starting at 12.00am)

Source: Electricity Authority

HVDC_Flows

- 3.40 In the metered data files received from EMS, if the generation type filed is 'DC', then the record represents energy flows over the HVDC link. The flow direction field can be used to infer whether the flow is southward or northward.

Table 18: HVDC_Flows

Field name	Format	Description
POC	7 character alphanumeric	Point of connection code
NWK_Code	4 character alphabetic code	Network Code.
GENERATION_TYPE		if this is DC, the record represents energy flows over the HVDC link
TRADER	4 character alphabetic code	
UNIT_MEASURE		
FLOW_DIRECTION	1 character alphabetic code	I or X. Infers whether the flow is southward or northward
STATUS		
TRADING_DATE	DD/MM/YYYY	
TP1 – TP48		Half-hour trading periods of the day (starting at 12.00am)

Source: Electricity Authority

Reactive_power

3.41 The reactive power files contain half-hourly reactive power data.

Table 19: Reactive_power

Field name	Format	Description
POC	7 character alphanumeric	Point of connection code
NWC_Code		
GENERATION_TYPE		
TRADER		
UNIT_MEASURE		
FLOW_DIRECTION		
STATUS		
TRADING_DATE	DD/MM/YYYY	

Field name	Format	Description
TP1 – TP48		Half-hour trading periods of the day (starting at 12.00am)

Source: Electricity Authority

Unit_level_generation_IR

- 3.42 Certain generation units exceeding 60MW capacity are charged the costs of procuring instantaneous reserves (IR) on a pro-rated basis. Each month, EMS provides the Authority with a file of half hourly output from these units.

Table 20: Unit_level_generation_IR

Field name	Format	Description
POC	7 character alphanumeric	Point of connection code
Unit_Code	2 character alphanumeric code	G1 / G2 / G3 / G4
Participant_Code	4 character alphabetic code	Abbreviated entity name
Gen_Measure		kWh
Flow_Direction	1 character alphabetic code	I or X
Gen_Type		
Trading_date	dd/mm/yyyy	
TP1 – TP48		Half-hour trading periods of the day (starting at 12.00am)

Source: Electricity Authority

Reconciliation

Network_supply_points_table

Table 21: Network_supply_points_table

Field name	Format	Description
CURRENT	Numeric, 1 digit	
NSP	13 character alphanumeric code	Network supply point identifier
NSP_REPLACED_BY		

Field name	Format	Description
POC_CODE	7 character alphanumeric	Point of connection code
NETWORK_PARTICIPANT	4 character alphabetic code	Abbreviated entity name
EMBEDDED_UNDER_POC_CODE		
EMBEDDED_UNDER_NWK_PARTICIPANT	4 character alphabetic code	Abbreviated entity name
RTYP_CODE		
X_FLOW		
I_FLOW		
DESCRIPTION		
ISLAND	2 character alphabetic code	SI / NI
NETWORK_REPORTING_REGION	Text	Region and company. Note: A NRR is defined by a group of Network supply points (NSPs)
START_DATE	yyyy-mm-dd	
START_TP		
END_DATE	yyyy-mm-dd	
END_TP		
SB_ICP		
BALANCING_CODE		
MEP	4 character alphabetic code	Abbreviated entity name
RESPONSIBLE_PARTICIPANT	4 character alphabetic code	Abbreviated entity name
CERTIFICATION_EXPIRY	dd/mm/yyyy	Certification expiry

Source: Electricity Authority

Network_region_shapefiles

- 3.43 Shapefiles for network derived regions (network reporting regions and zones) are available in GeoJSON, Mapinfo TAB and ESRI shapefile formats for WGS84 and NZTM geodetic systems. Shapefiles for regional councils, islands and New Zealand are made available by Statistics New

Zealand at http://www.stats.govt.nz/browse_for_stats/Maps_and_geography/Geographic-areas/digital-boundary-files.aspx. **Error! No document variable supplied.**

Transmission

Power_system_analysis

DigSILENT_case_files

- 3.44 Power flow cases from the System Operator. Each case includes a Peak Load and a Light Load study case. The DigSILENT cases include the system dynamic model and the power flow model.

PSSE_raw_files

Line_diagrams

- 3.45 The line diagrams have been provided by Transpower. They include diagrams of the power systems in the North and South Island, as well as loadflow diagrams.

4 Contents of ancillary services folder

A very brief description of ancillary services

- 4.1 The system operator is responsible for ensuring that certain ancillary services essential to maintaining the system-wide quality of electricity supply are provided.
- 4.2 These services are:
- (a) black start
 - (b) over-frequency reserve
 - (c) voltage support
 - (d) instantaneous reserves
 - (e) frequency keeping
- 4.3 Black start, over-frequency reserve, and voltage support are procured annually under contract from participants. Instantaneous reserves and frequency keeping are procured through the half-hourly wholesale market.
- 4.4 Instantaneous reserves are provided in two forms:
- (a) Fast instantaneous reserve (FIR) must be available within six seconds of an unexpected generator or transmission outage and must be able to operate for one minute.
 - (b) Sustained instantaneous reserve (SIR) must be available within sixty seconds of an unexpected generator or transmission outage and must be able to operate for fifteen minutes.

Frequency_keeping

- 4.5 Frequency keeping (FK) refers to the process of balancing the fluctuations between electricity generation and electrical load. It manages the variability in the grid's frequency output. Frequency keeping power stations are used to increase or decrease generation within a set band to ensure supply equals demand on a second-by-second basis.
- 4.6 Frequency keeping requirements are determined half-hourly by the system operator but outside of the SPD market clearing software. The price paid for frequency keeping services is based on offers made by participants ahead of real-time.
- 4.7 The frequency keeping datasets are classified into three categories:
- (a) Constrained_costs
 - (b) Dispatched_offers
 - (c) Final_offers

Constrained_costs

- 4.8 Monthly CSV files report constrained on/off costs paid to participants.

Dataset:	FK constrained costs
Source:	Transpower (system operator)
Available from:	December 2013
Frequency:	Monthly

Format: CSV

Table 22: FK constrained costs

Description of fields

Field name	Format	Description
Trading_date	yyyy-mm-dd	Date
Trading_Period	Integer	Trading period
CON_IND	ON/OFF	Constrained on/off indicator
ORG_Code	4 character alphabetic code	Organisation code
GIP_GXP_FULL	3 character alphabetic code	
STATION		
BLOCK_ID	3 character alphabetic code	
Quantity	Numeric	MW
Price	Numeric	\$/MWh
Amount	Numeric	Dollars

Source: Electricity Authority

Dispatched_offers

- 4.9 The dispatched offers datasets is made available in two formats:
- (a) Daily XML files
 - (b) Monthly CSV files
- 4.10 As the name suggests, this dataset contains data relating only to those offers that were dispatched.
- 4.11 A rolling window of 40 days' worth of XML files are made available. The XML files are published daily but after they've been on the FTP server for 40 days they are deleted. At the beginning of each month, the data from the daily XML files for the preceding month is packaged up into a single monthly CSV file that contains the daily data for dispatched frequency keeping offers. The CSV files are collated in folders labelled by year.
- 4.12 The table that follows refers to the daily XML files. While the field names are not described for the monthly CSV files, they are practically identical to the daily XML files.
- 4.13 Finally, a warning: the process by which Transpower extracts and supplies the dispatched offers data to the Authority is currently unreliable and occasionally errors may be detected in the daily XML files. Participants can be assured that this error does not occur in the completely separate process that calculates frequency keeping payments. Nor do the monthly CSV files contain errors.

Dataset: FK dispatched offers
 Source: Transpower (system operator)
 Available from: June 2013
 Frequency: Daily
 Format: XML

Table 23: FK dispatched offers

Description of fields

Field name	Format	Description
OFFER_SUBMISSION_DATE	dd/mm/yyyy hh:mm:ss	Date and time offer submitted
TRADING_PERIOD_START_DATE	dd/mm/yyyy	Trading date to which offer applies
OFFER_PRICE	Numeric	\$/Block
FREQUENCY_BAND_MW	Numeric	MW/Block
ISLAND_NAME	2 char alphabetic code	Island
PNODE_NAME	Alphanumeric code	Station offer (e.g. HLY2201 HLY5) or Block offer (WTO)
TRADER_NAME	4 char alphabetic code	Abbreviated trader name
TRADING-PERIOD	Integer	The trading period to which the offer applies

Source: Electricity Authority

Final offers

- 4.14 The final offers datasets is made available in two formats:
- (a) Daily XML files
 - (b) Monthly CSV files
- 4.15 As the name suggests, this dataset contains data relating to all offers made to supply frequency keeping services that were in place at the time of dispatch, including those offers not dispatched. Offers that were withdrawn or modified pre-dispatch are not in this dataset.
- 4.16 A rolling window of 40 days' worth of XML files are made available. The XML files are published daily but after they've been on the FTP server for 40 days they are deleted. At the beginning of each month, the data from the daily XML files for the preceding month is packaged up into a single monthly CSV file that contains the daily data for dispatched frequency keeping offers. The CSV files are collated in folders labelled by year.
- 4.17 The table that follows refers to the daily XML files. While the field names are not described for the monthly CSV files, they are practically identical to the daily XML files.

Dataset: FK final offers
 Source: Transpower (system operator)
 Available from: June 2013
 Frequency: Daily
 Format: XML

Table 24: FK final offers

Description of fields

Field name	Format	Description
SUBMISSION_DATE	dd/mm/yyyy hh:mm:ss	Date time offer submitted
PNODE_NAME		FK offer block ID, e.g. 'WTO' or 'TKU2201 TKU0'
TRADER_NAME	4 character alphabetic code	Abbreviated trader name
MW	numeric	MW/Block
PRICE	numeric	\$/Block
MIN_MW	numeric	Marginal minimum generation required
MAX_MW	numeric	Marginal maximum generation limit
SRC_OFFER_BLOCK_ID	digit	Offer block id (1 to 5)
TRADING-PERIOD	numeric	The period to which the offer applies

Source: Electricity Authority

5 Contents of forward markets folder

5.1 The Forward markets folder contains nothing at this point in time.

6 Contents of environment folder

Hydrological_modelling_dataset

6.1 The hydrological modelling dataset (HMD) consists of three main components:

- (a) Infrastructure and hydrological constraint attributes – this dataset records standing information about the capability of the main hydro schemes.
- (b) Flows – this time series dataset records data for inflows for reservoirs and flows at various existing or potential hydro generating sites.
- (c) Storage and spill – this time series dataset records storage for the main hydro schemes.

- 6.2 Opus International assists the Authority to prepare and publish the HMD on an annual basis.

Archive

- 6.3 The HMD is a development of the old, so-called Spectra model dataset. The last Spectra update was published in 2010 and is available from the archive folder.

7 Contents of supplementary information folder

2015

20150224_Transpower_TPM_operational_review_proposal

20150421_Transpower_proposed_variation_to_TPM

20150609_Sharing_SIR_across_the_HVDC

20150616_TPM_options_working_paper

2014

20140121_TPM_Beneficiaries_pay_working_paper

- 7.1 This folder contains input data and modelling results prepared in support of the beneficiaries pay working paper that was consulted on in March 2014 as part of the transmission pricing review.

- 7.2 See also: <http://www.ea.govt.nz/development/work-programme/transmission-distribution/transmission-pricing-review/consultations/#c7492>.

20140127_ERI_Historical_analysis_of_electricity_costs

- 7.3 The contents of this directory includes the models, input data and modelling output that was generated by the Authority in support of the report *Historical analysis of electricity costs*, published in January 2014.

- 7.4 See also <http://www.ea.govt.nz/monitoring/enquiries-reviews-and-investigations/2013/historical-analysis-of-electricity-costs/>.

20140720_NZIER_synthetic_retail_price

- 7.5 This folder contains documentation of a 'synthetic retail price' constructed by NZIER. A spreadsheet demonstrating its construction is also available.

Archive

20091101_Demand_forecasting

- 7.6 Various documents, data files and models detailing the Electricity Commission's electricity demand forecasting work. The documentation is collected together in the folder entitled *Demand_forecast_review_documents*.

20091101_Long-term_generation_development

- 7.7 Various documents detailing the Electricity Commission's work in preparing long-term generation scenarios in support of the grid planning and investment process.

7.8 Documents exploring topics such the potential impact of emerging technologies, e.g. marine and solar energy, electric vehicle uptake and the future availability of gas in New Zealand are available.

20101109_Wind_integration_analysis

7.9 A collection of documents and data tables prepared by the Electricity Commission circa 2010.

8 Glossary of abbreviations and terms

Act	Electricity Industry Act 2010
ASX	Australian Stock Exchange, specifically https://asxenergy.com.au/
Authority	Electricity Authority
Code	Electricity Industry Participation Code 2010
CSV	Comma-separated values. A CSV file is a text file containing fields separated by commas.
Cumec	Cubic metre per second – a water flow rate measure
EMI	Electricity market information
FIR	Fast instantaneous reserve
FK	Frequency keeping
FTP	File transfer protocol
ICP	Installation control point
ISO	International Organization for Standardization
MBIE	Ministry of Business, Innovation, and Employment
MWh	Megawatt hour
Regulations	Electricity Industry (Enforcement) Regulations 2010
SIR	Sustained instantaneous reserve
SPD	Scheduling, pricing and dispatch
XML	Extensible markup language