

Electricity Commission

Pricing manager

Draft

Functional specification

Version 2

July 2006

This document reflects the draft Electricity Governance Rules 2003 (Rules) as at December 2005. Subsequent rule changes and transitional requirements have yet to be included.

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Revision history

Version	Release date	Description
Draft 1	March 2006	Initial version.
Draft 2	July 2006	Change to front page and some document formatting.

Pricing manager functional specification

1 Introduction

The responsibilities of the pricing manager role are defined in the Rules. They are to be carried out by a service provider on behalf of the Electricity Commission (Commission). The terms and conditions under which service providers are appointed and must act are set out in the Electricity Governance Regulations (Regulations).

The primary responsibility of the pricing manager, as defined in the Rules, is the calculation and publication of provisional and final prices for energy and reserves. The calculations are performed by modeling software designed for the pricing manager which is maintained by and leased from the system operator.

2 This document

This document describes the responsibilities and functions of the pricing manager service provider, as set out in part G section V of the Rules. The document details data requirements and business processes but not any actual file formats. It is expected that the service provider responsible for fulfilling the pricing manager role will develop interfaces with participants and with other service providers for the delivery of information to and from the pricing manager, as required by the Rules.

3 Rule references and regulations

The rules referred to in this document are contained in part G section V of the Rules.

These Rules and Regulations can be downloaded from www.electricitycommission.govt.nz.

The version of the Rules used in this document is the draft rules dated 16 November 2005.

4 The current environment

The pricing manager licenses a version of the modeling software from the system operator. Under the terms of the license, the system operator warrants that the software will enable the pricing manager to meet its obligations under the Rules and Regulations and that it performs according to its published software specification.

There are two parts to the software: a database managed by the system operator; and a separate piece of software that resides on the pricing manager's PC, which extracts the information from the system operator's database and performs the calculations. The outputs are transmitted back to the system operator's system for subsequent publication via the wholesale information and trading system.

5 Information flows of the wholesale electricity market

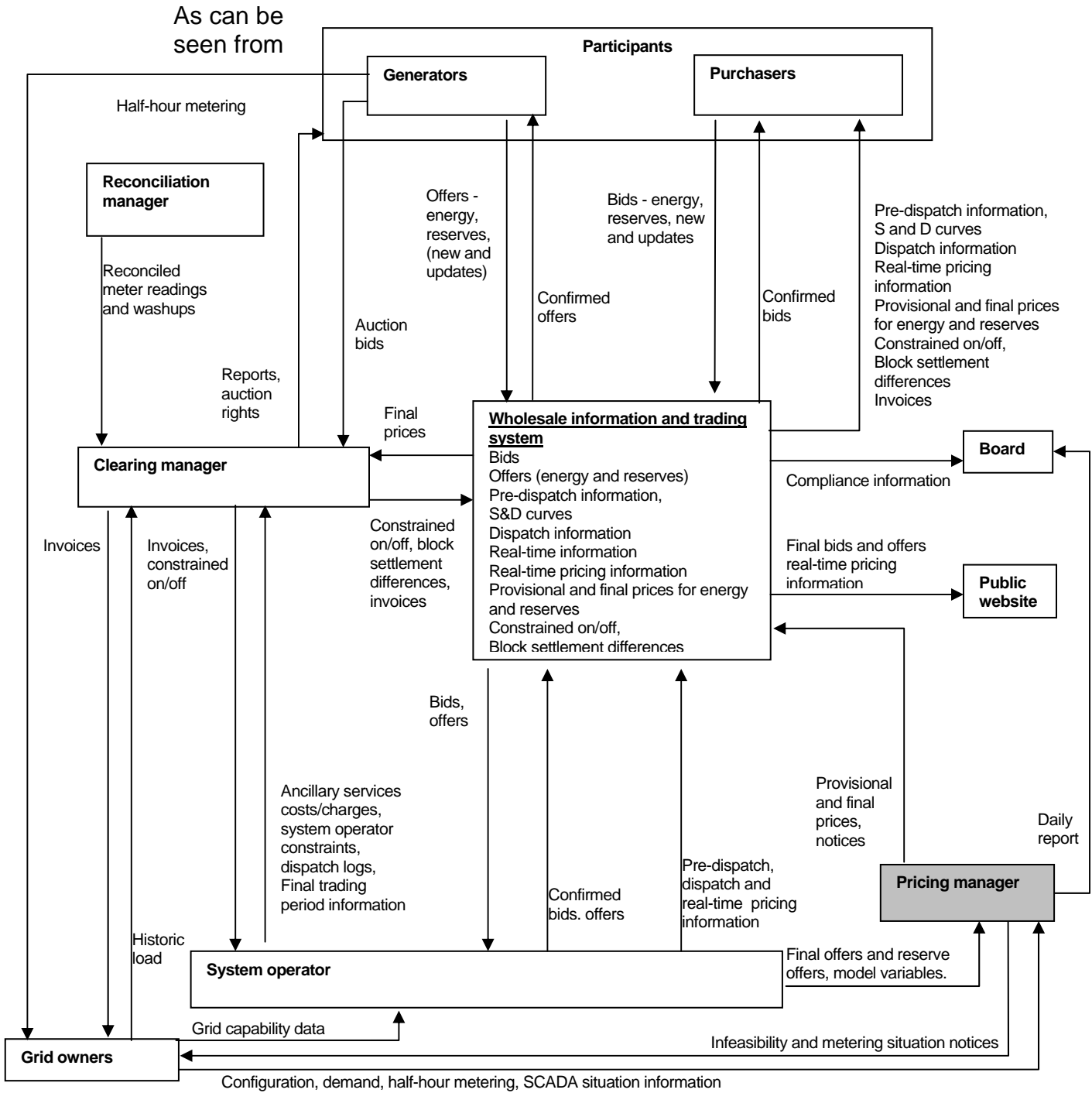


Fig 1. Current information flows between service providers and participants.

Figure 1, the pricing manager receives data from both the system operator and grid owners. This information is fed into the database that is accessed by the modeling software which calculates the provisional and final prices. Once calculated, the prices are published to the market. The clearing manager uses final prices in the settlement (invoicing) process.

The information required by the pricing manager to calculate provisional and final prices and its sources is shown below. It must all be delivered by the suppliers each business day before 0730 hours and must cover all the trading periods of the previous trading day.

Information required	Rule reference (part G section V)	Supplier
Local network half-hour metering information (generation subject to a dispatch instruction, un-offered generation and intermittent generation)	3.2	Generators (by 0500 hours) currently supplied via the system operator
Existing generation configuration (instantaneous MW injection data or estimate at GIPs)	3.3.1	Grid owners
Actual demand —half hour metering information at the GIP/GXPs	3.3.2	Grid owners
SCADA situation and/or metering situation information (per trading periods per GIP/GXP, if exists)	3.5 and 3.7	Grid owners
Expected supply —final offers excluding those for intermittent generators	3.3.3 and 3.8 section III	System operator
Reserve offers	3.3.4 and rule 6 Section II	System operator
System operator information	3.3.5 and 3.8 section III	System operator
Model parameters	3.33 and scheduleG2	System operator

6 The pricing process

Each trading day, the pricing manager is required to calculate final prices for energy and reserves for the previous trading day. They are required to be published by 1200 hours using the data identified above as inputs to the modeling software. However, if a 'provisional pricing situation' exists or eventuates, then these resultant prices are published as 'provisional' instead and attempts are made to resolve the situation.

It must be noted that the resolution of a provisional pricing situation is dependant on the ability of the relevant parties to provide revised information. The grid owners and generators are operational every trading day however the responsible department of the system operator only operates in business hours on business days. The Rules make allowances for this situation.

A provisional price situation is deemed to exist whenever one of the following occurs:

- the solution from the modeling software for at least one trading period is infeasible i.e. it yields no price;
- there is a SCADA situation; or
- there is a metering situation, ie some metering data is unavailable.

Note: a provisional pricing situation usually applies to specific trading periods but if there is at least one for a single trading period then all prices are regarded as provisional.

Notifications of provisional pricing situations

The pricing manager is required to give notices of any provisional pricing situation to various parties. However, it is the notice given to grid owners and generators at 0900 hours on the day the pricing manager receives the information that signals that a provisional pricing situation exists. (rule 3.6)

Process in the event of a provisional pricing situation

The grid owners have three opportunities to provide revised information in order for the pricing manager to successfully calculate a final price.

1. The first opportunity is by 1000 hours of the day the provisional pricing situation is notified if the day is a business day, otherwise by 1200 hours of the second business day after. (rule 3.8).

2. The second opportunity is by 1200 hours of the second business day following the publication of a provisional pricing situation (rule 3.16).
3. The third and final opportunity is by 1600 hours of the second business day following the publication of a provisional pricing situation (rule 3.19).

After the receipt of revised data, the pricing manager re-runs the modeling software to try to calculate the final prices again.

If the result of running the modeling software is a success and there is a price calculated for each trading period for the day in question then the pricing manager publishes final prices by the following times.

1. If success is achieved on the first opportunity above then by 1200 hours of the day the provisional pricing situation arose if the day is a business day otherwise by 1200 hours of the second business day after.
2. If success is achieved on the second opportunity above then by 1400 hours of the second business day following the publication of the provisional pricing situation.
3. If success is achieved on the third opportunity above then by 1800 hours on the second business day following the publication of the provisional pricing situation.

If the attempt is unsuccessful, or revised information is not provided by the times specified, the pricing manager publishes the following:

1. After the first opportunity above, provisional prices from the first run of the modeling software are published by 1200 hours of the day the provisional pricing situation arose if the day is a business day, otherwise by 1200 hours of the second business day after. Also, a notice is published to the market at the same time and the board notified by 0900 hours the next day. The outputs from the revised run are discarded.
2. After the second opportunity above, provisional prices are published along with a notice detailing the infeasibilities by 1400 hours of the second business day following the publication of a provisional pricing situation.
3. After the third opportunity above, final prices are published for all trading periods not affected by the provisional price situation by 1800 hours on the second business day following the publication of the provisional pricing situation. A notice of the inability to publish final prices for the affected trading periods is also published to the market and to the board. The pricing manager calculates final prices for

those trading periods affected by the provisional pricing situation using the method given below.

If the grid owners do not provide revised information and the provisional pricing situation remains unresolved, the pricing manager publishes final prices for all trading periods not affected by the provisional price situation by 1800 hours on the second business day following the publication of a provisional pricing situation. The pricing manager also publishes a notice of the inability to produce final prices for the affected trading periods to the market and the Board, and calculates final prices for those trading periods affected by the provisional pricing situation using the method given below.

Calculation of final prices

In the event that infeasibilities are still present in the results for one or more trading periods after the third attempt at recalculation, the pricing manager is required to calculate final prices.

For energy, the final price for net GIPs, this is the highest price at the point that the loss adjusted demand intersects with the offer stack. For net GXPs, the price is 1.05 times the net GIPs price.

For reserves, the final price is the mean of the relevant final prices of the corresponding day in each of the four previous weeks.

These prices are to be published by 1800 hours on the second business day following the publication of a provisional pricing situation.

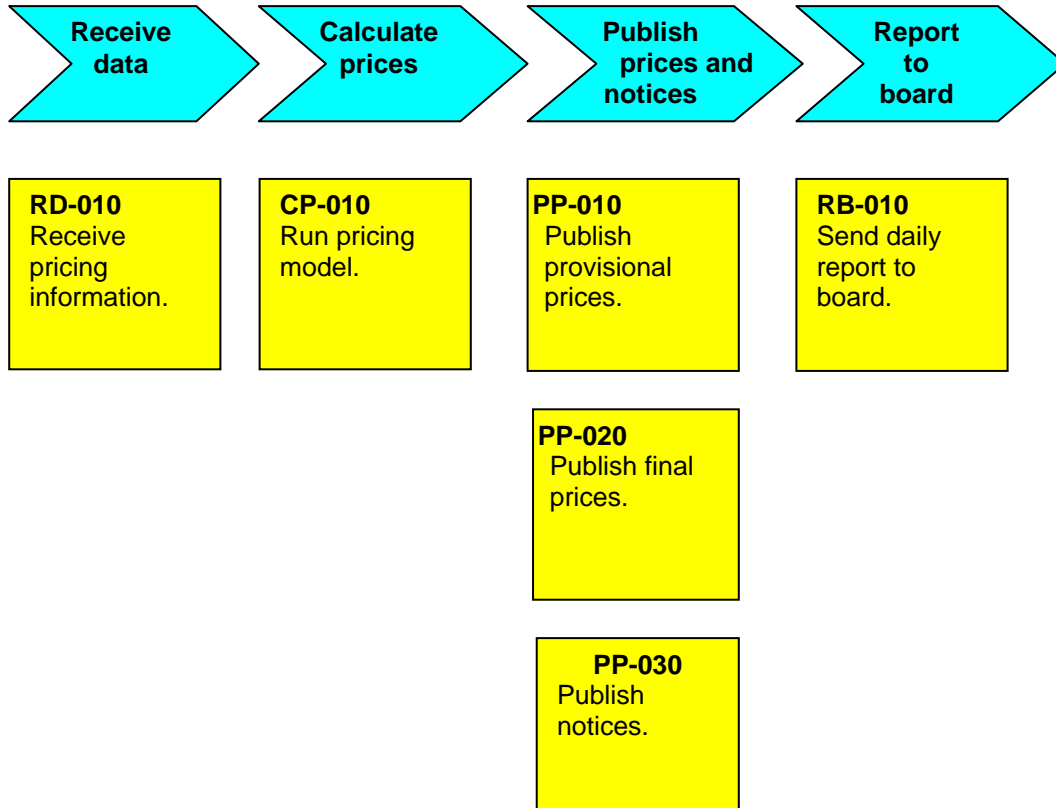
7 Publication of provisional prices, final prices and notices

The provisional and final prices are transferred to the Wholesale Information and Trading System (WITS) for publication.

Information	Rule reference (part G section V)	Destination
Provisional prices for energy and reserves	3.11.2, 3.12.2, 3.14 2.1 (energy only)	Purchasers and generators Clearing manager
Final prices for energy and reserves	3.4, 3.21	Purchasers and generators
Provisional price situation notices	3.3.3	System operator Board

8 Process maps

Process map—calculate and publish provisional and final prices



9 Sub processes

Sub process	RD-010 Receive pricing information
Process	Receive data
Source	System operator, grid owners, generators
Destination	Pricing manager
Rule references	3.2
Dependencies	

Description
To run the pricing model, the pricing manager receives information daily from the system operator, grid owners, and generators.

Business requirements
<ol style="list-style-type: none"> 1. The pricing manager must agree with the other participants providing data on the format and method of transfer of the data required to run the pricing model. 2. The pricing manager must ensure that the mechanisms agreed for the transfer of data are secure. 3. Every trading day, the pricing manager must be able to receive all the required data for the previous trading day before 0730.

Processing

Data input:
<ol style="list-style-type: none"> 1. From generators and embedded generators: <ul style="list-style-type: none"> • half-hour information adjusted for losses in relation to generating plant that injects electricity directly into a local network or where electricity flows into a local network without passing through a GIP/GXP; and • unoffered and/or intermittent generation from generating stations connected to the grid. 2. From grid owners: <ul style="list-style-type: none"> • notification when a SCADA situation exists and which trading periods of

the given trading day are affected;

- data specifying the instantaneous MW injection at GIPs where offers were made during trading periods of the previous trading day or a reasonable estimate of such data;
- GIP/GXP actual demand data for each trading period of the previous trading day or an estimate of such data;
- revised data after a provisional price situation; and
- revised half-hour metering information after an estimate.

3. From the system operator:

- final offers for energy and reserves for each trading period of the previous trading day (excluding offers from intermittent generators);and
- other final information for each trading period received by the system operator during trading.

Data outputs

The data input formatted and stored for use in the modelling process.

Sub process	CP-010 Run pricing model
Process	Calculate prices
Source	Pricing manager
Destination	Pricing manager
Rule references	3.3
Dependencies	RD-010 receive pricing inputs.

Description
<p>After receiving the necessary information, the pricing manager runs the pricing model to calculate prices for a given trading day. If prices are obtained for every trading period and there is no provisional pricing situation, they are declared as final prices. In the case of a provisional pricing situation and where revised data is provided, the model can be re-run.</p>

Business requirements
<ol style="list-style-type: none"> 1. Final prices must be calculated for energy and reserves before 12:00 hours each trading day using the appropriate data for the day. 2. Final offers from intermittent generators must be removed from pricing run data. 3. In the event of a provisional pricing situation, the pricing model can be re-run whenever the appropriate revised data becomes available.

Processing
<p>Pricing manager</p> <ol style="list-style-type: none"> 1. Runs the pricing model using the data relevant to a given trading day. 2. If the result of the run is a success and there is a price calculated for each trading period for the trading day in question then the prices are final ones. 3. If a provisional pricing situation exists when the model is run or an infeasibility situation arises during the run then all the prices are regarded as provisional.

Data inputs
Data for the given trading day as received in sub-process RD-010.

Data outputs
1. Final prices and final reserve prices.
Or
2. Provisional prices and provisional reserve prices.



Sub process	PP-010 Publish provisional prices
Process	Publish prices and notices
Source	Pricing manager
Destination	Participants
Rule references	Wholesale information and trading system
Dependencies	3.11, 3.12
	CP-010



Description
<p>The pricing manager sends provisional prices to WITS for publication to market participants.</p> <p>Provisional prices are only provided if there is a 'provisional pricing situation', ie where there is a metering, SCADA or infeasibility situation and final prices cannot be provided.</p>

Business requirements
Provisional prices must only be published to the market when there is a provisional pricing situation.

Processing
<p>Pricing manager</p> <p>Sends the provisional price information, determined from the pricing model using the appropriate data, to the WITS for publication.</p>

Data inputs
Provisional prices and/or provisional reserve prices from the modelling software.

Data outputs

Provisional prices for either energy or reserves or both.

Provisional prices for energy are provided per trading day, trading period and GIP/GXPs.

Provisional prices for reserves are provided for both fast and sustained reserves per trading day and trading period at the island reference points of Haywards (HAY2201) and Benmore (BEN2201).

Sub process	PP-020 Publish final prices
Process	Publish prices and notices
Source	Pricing manager
Destination	Participants
Rule references	Wholesale information and trading system
Dependencies	3.4, 3.18, 3.21
	CP-010

Description

The pricing manager sends final prices to the WITS for publication to market participants.

Final prices will be available for all trading periods in a trading day except when there is a 'provisional pricing situation' and final prices cannot be provided.

Business requirements

Final prices and final reserve prices must be published by 1200 on a given trading day for the previous trading day.

Processing

Pricing manager

Sends the final price information, determined from the pricing model using the appropriate data, to the WITS for publication.

Data inputs

Final prices and final reserve prices from the modelling software.

Data outputs

- Final prices for either energy or reserves or both.
- Final prices for energy are provided per trading day, trading period and GIP/GXPs.
- Final prices for reserves are provided for both fast and sustained reserves per trading day and trading period at the island reference points of Haywards (HAY2201) and Benmore (BEN2201).

Sub process	PP-030 Publish notices
Process	Publish prices and notices
Source	Pricing manager
Destination	Grid owners, generators, the market
Rule references	3.6.1.1, 3.11.1, 3.23.4
Dependencies	

Description
The pricing manager notifies grid owners, generators, and the market whenever a provisional pricing situation occurs and whenever one remains unresolved.

Business requirements
<ol style="list-style-type: none"> 1. Notices to the market must be posted through the WITS 2. Grid owners and generators must be notified of infeasibility and metering situations. The notice must specify the affected trading period(s) and be published by 0900 hours on the day of the situation is detected. 3. Notice of the existence of a provisional pricing situation must be published to the market by 1200 hours on a business day. 4. Notice of a provisional price situation that remains unresolved at the end of a business day must be published to the market by 1800 hours.

Processing

Data inputs
Information pertinent to a provisional pricing situation that includes the affected trading periods, the type of situation and the reason for the situation.

Data outputs
Notice(s).

Sub process	RB-010 Send daily report to board
Process	Report to board
Source	Pricing manager
Destination	Board
Rule references	7.1
Dependencies	

Description
The pricing manager sends the board a report every day.

Business requirements:
<ol style="list-style-type: none"> 1. The report must be sent by 0900 hours every day. 2. It must cover the period from 0700 hours on the previous trading day to 0630 hours on the day the report is due. 3. It must include : <ul style="list-style-type: none"> • any provisional prices that the pricing manager has published; • details of any breaches to the rules by the pricing manager or other participant; and • a daily situation report detailing if flows on any branches were at their maximum capacity and whether the status of the circulating HVDC link and branch flows was abnormal.

Processing

Data inputs
<ol style="list-style-type: none"> 1. Provisional prices for energy and reserves. 2. Rule breaches. 3. Flows on branches, branch capacities and HVDC link status.

Data outputs

1. Provisional prices for energy per:
 - GIP/GXP;
 - trading date; and
 - trading period.
 2. Provisional prices for fast and sustained reserves per:
 - island reference point (Benmore or Haywards);
 - trading date; and
 - trading period.
 3. Rule breaches:
 - date when prices were published late;
 - whether the delay in publication was due to the pricing manager;
 - time of the breach;
 - nature of the breach; and
 - reason for the breach.
 4. Daily situation report::
 - trading date;
 - trading period;
 - branch flows at capacity;
 - HVDC link status; and
 - branch-flow status.
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