



DRAFT

em⁶ User Guide

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1. Purpose

This user manual gives a full user guide to the em⁶ web application. EMS is focused on the continual improvement of the em⁶ application, supporting processes and materials. If you have any questions, comments or suggestions about this guide, please email call@ems.co.nz.

2. Getting Started

2.1 Obtaining an em⁶ Account

To obtain an em⁶ account please contact Peter Law on +64 4 4630 865 or peter.law@ems.co.nz.

2.2 Your account

Once your user account has been setup, your username will be emailed to you. We will then call you to provide you with your password. These details will allow you to access em⁶.

Your username will always remain the same and you should ensure that you keep this information in a safe place.

2.3 Administration of user accounts

To create, amend or delete a user account you will need to contact the system administrator at call@ems.co.nz.

Please Note: If your account becomes locked, you will need to email call@ems.co.nz to request that your account is unlocked.

2.4 Account permissions

Permissions are set by organisation. Each user will have the permissions and reports that are allocated to their organisation.

Please Note: If you do not have access to a report or the customisation tab it may be because either your organisation has not subscribed to the appropriate service or because the report is restricted. Further detail on em⁶ services and restricted reports can be found below.

2.5 Accessing em⁶

To access em⁶, you need to type www.em6.co.nz into your internet browser window.

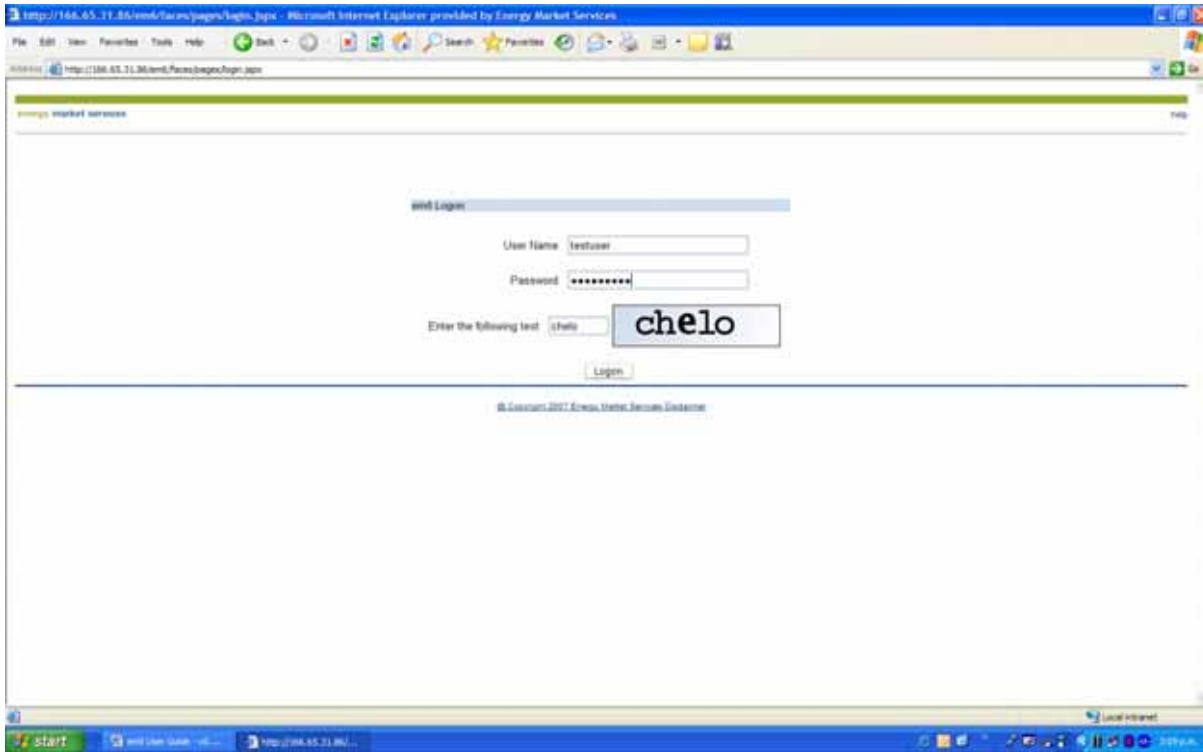


Figure 1

The logon page contains a user name, password and *captcha text* fields. To access em⁶ simply complete all fields and click logon.

 **Tip:** The *captcha text* field characters will be checked against the image characters. In the above image the text is 'chelo'.

2.6 Online help

Em⁶ has a context sensitive help system. If you need help while navigating any of the em⁶ screens, simply click on the 'help' button.

2.7 Services

There are 9 tabs available to users. Each tab corresponds to an em⁶ service:

- Home (Homepage)
- SCADA (Reports)
- Constraints (Reports)
- Dispatch (Reports)
- Reserves (Reports)
- Network (Reports)
- Price & Location (Reports)
- Master Files (Reports)
- Archive (Reports)
- Customise (Additional Functionality)

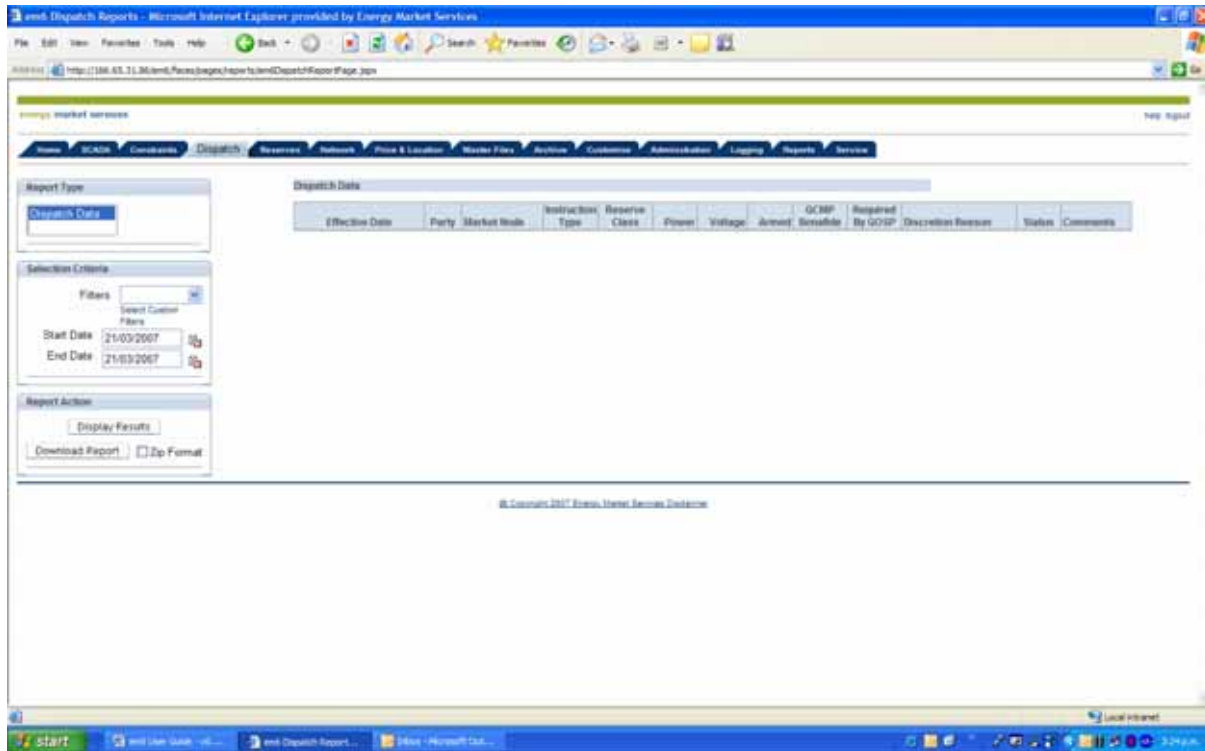


Figure 3

Beneath each service tab are reports or additional functionality.

2.8 Restricted Reports

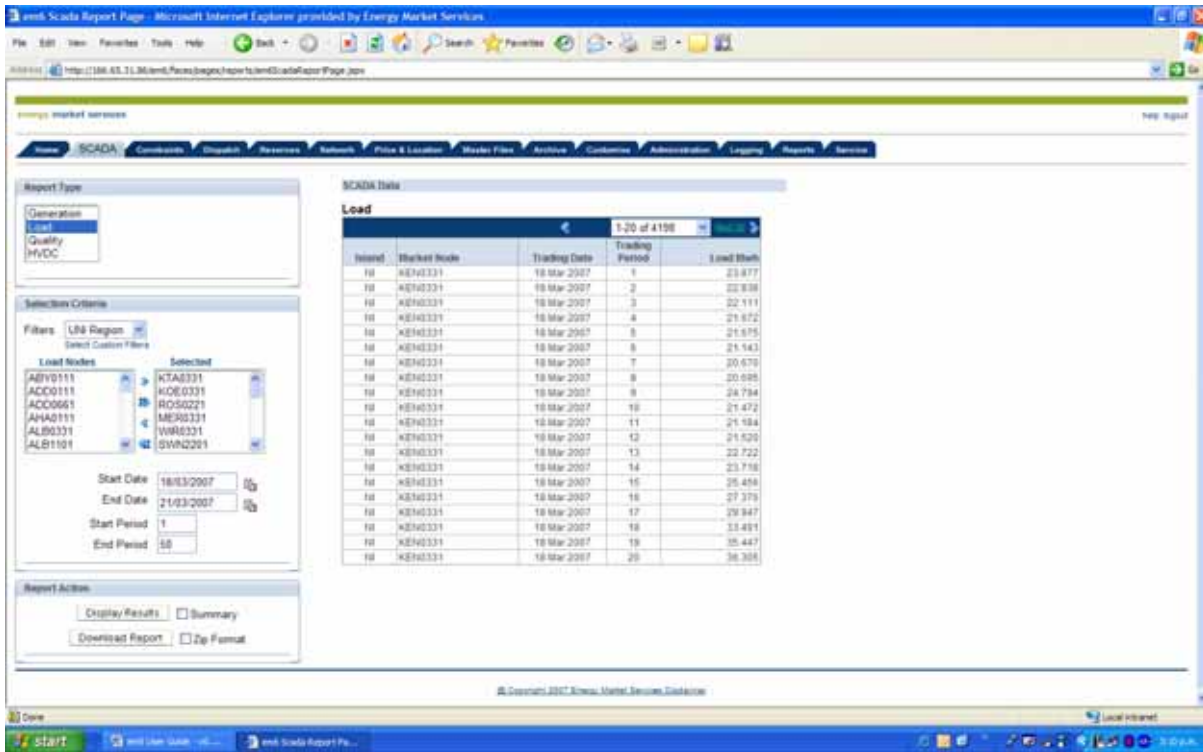
Some reports are restricted by an organisation's permissions. Where reports are restricted, users are only able to view the information pertaining to their organisation. If you submit a query and there is no data relating to your organisation, em6 will return a report that does not contain any data. An example is shown below.



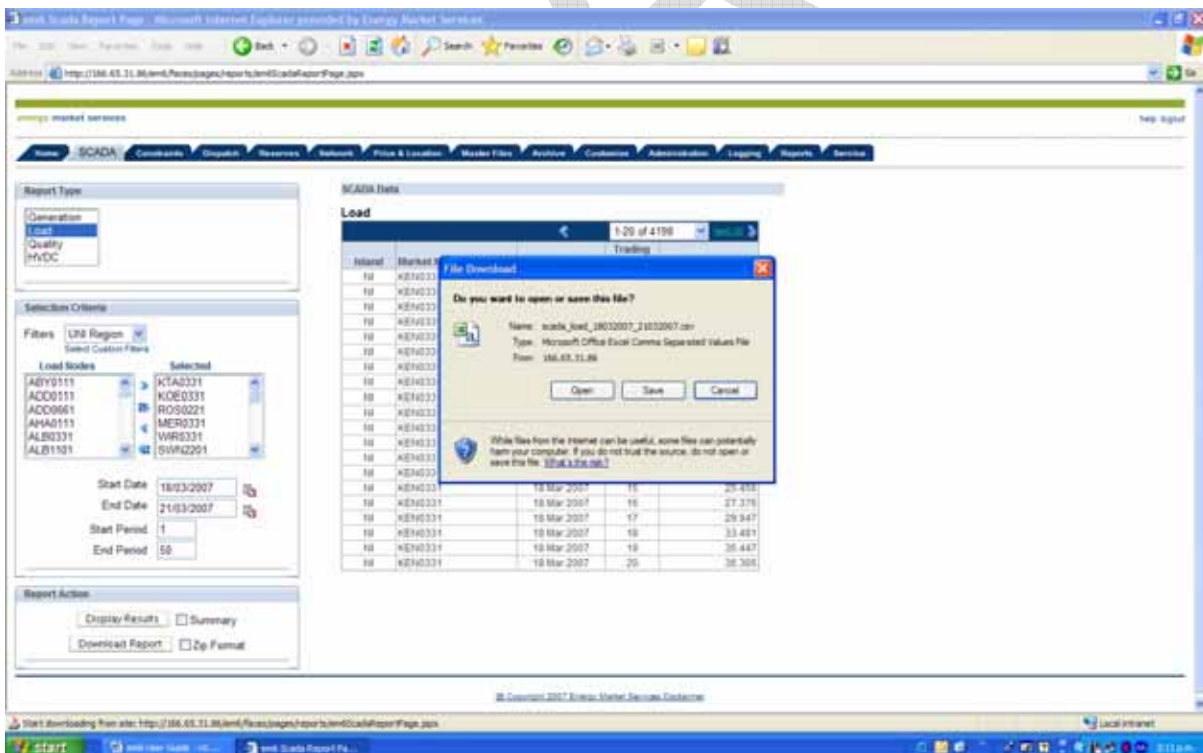
2.9 Download or Display Reports

All reports can be displayed onscreen or in CSV format for download and import to another software package such as Microsoft™ Excel.

If you choose to display a report it will appear in tabular format on the right hand side of the selection page. If the selection is too large the results will be truncated.



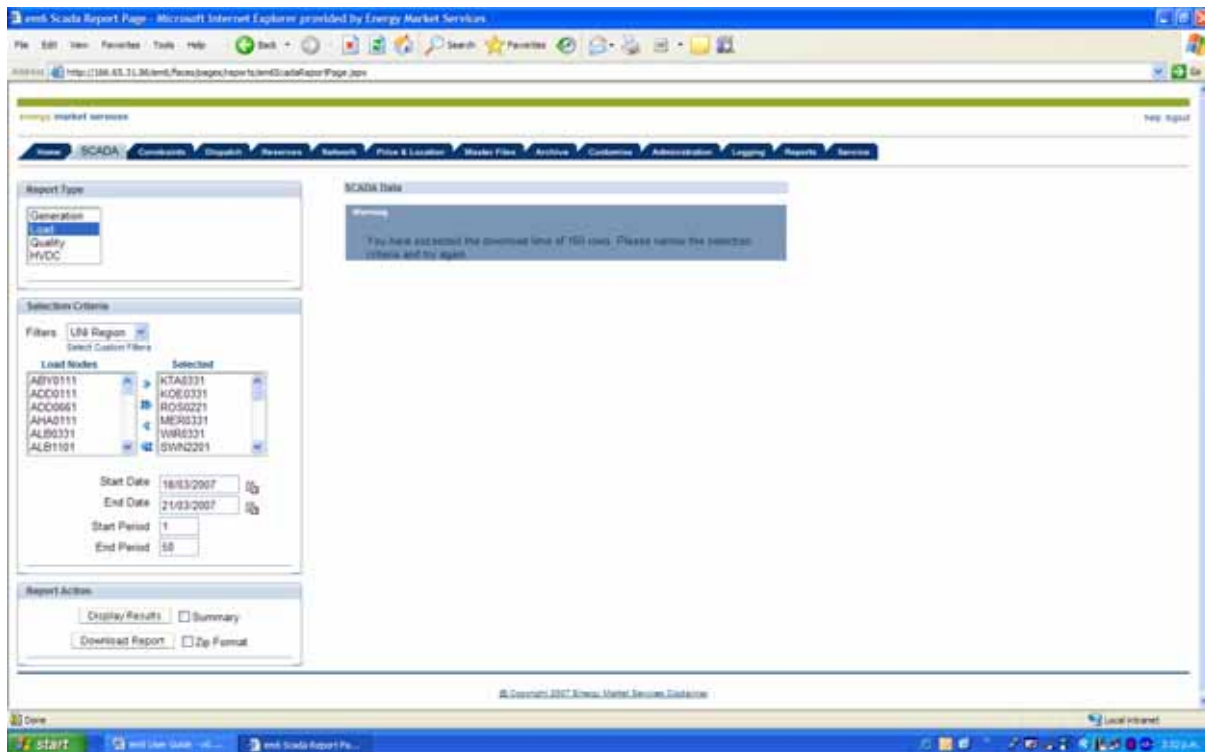
It is also possible to download the report; the *Download Report* action downloads the reports in either an uncompressed CSV format or by checking *Zip Format* in a zipped CSV format.



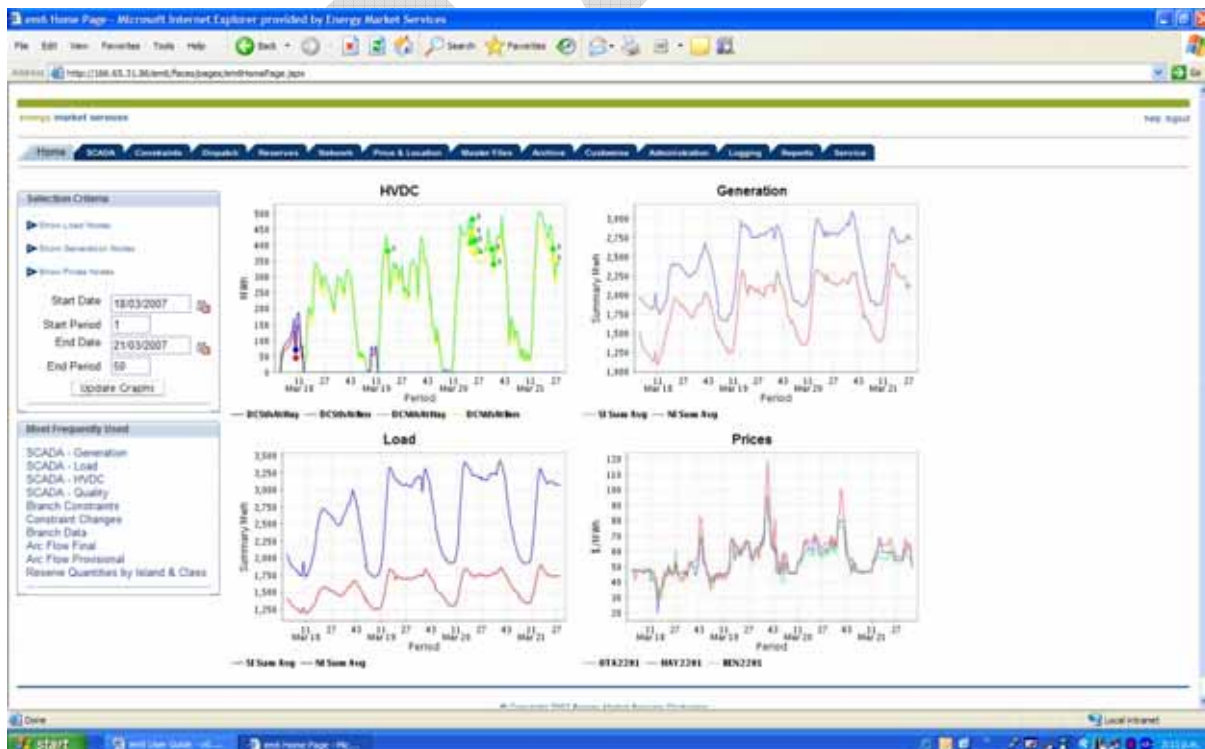
If the download size is less than the maximum application download limit, the user will be presented with the *Save or Open* pop up window.

If the download size is greater than the application download limit, an alert box will notify the user. If *Zip format* is unchecked and compression of the download file brings it below the limit, the

alert box will inform the user they can either download in zip format or narrow their selection criteria. Otherwise, the alert box will inform the user that they must narrow the selection criteria.



3. em⁶ Homepage



3.1.1 Description

The home page is presented to the user on successful logon to the em⁶ web portal. This page has three distinct areas:

- Selection Criteria
- Most Frequently Used
- Graphing Section

3.1.2 Selection Criteria

You can further refine your homepage selections by changing the selection criteria. Simply select one of the 'show' links and amend the selected nodes, dates and periods.



3.1.3 Most Frequently Used

The *Most Frequently Used* box on the page will allow users to quickly navigate to the most frequently requested report types. On clicking one of the *Most Frequently Used* links; the user will be taken to the relevant service tab with the report type pre-selected.

3.1.4 Graphing Section

The graphing section contains four graphs:

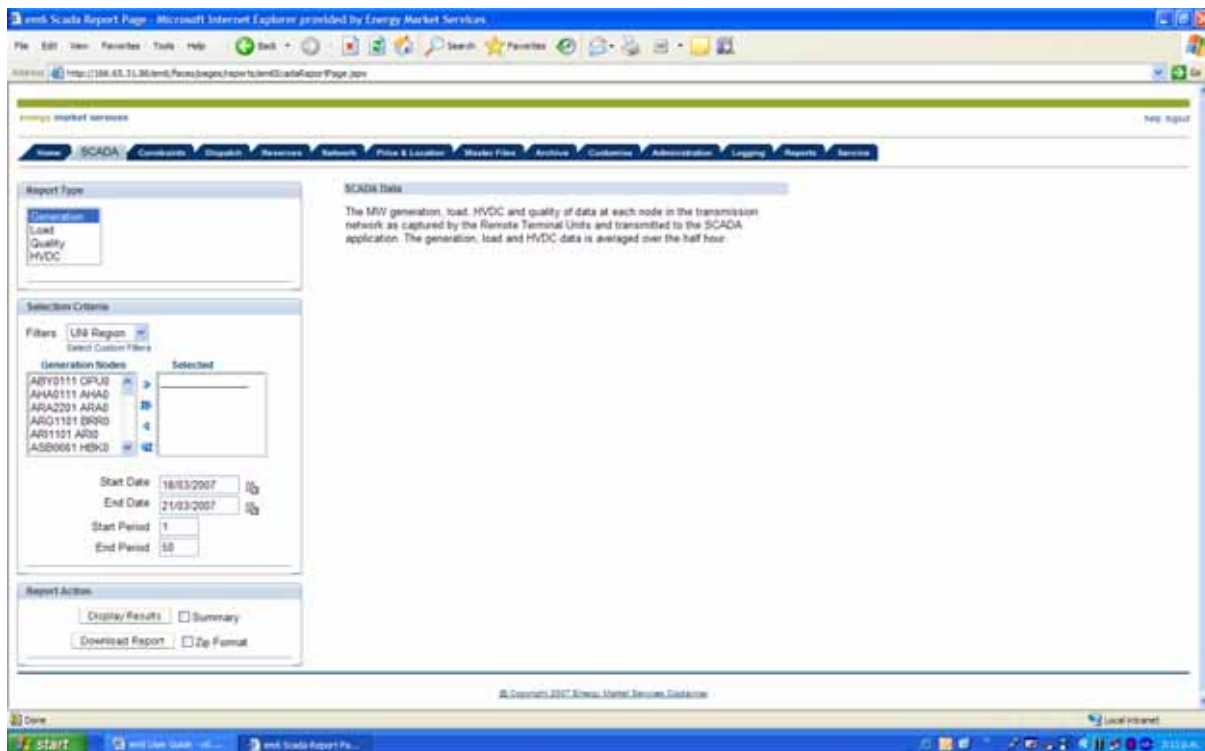
- HVDC
- Generation
- Load
- Dispatch Price

If the user hasn't subscribed to the customisation service the domains and ranges for these graphs are obtained from the default home page graphing filter (either the administrators defaults or the users customised homepage filter (see *Customisation*).

4. em⁶ Report Tabs

em⁶ consists of multiple tabs that hold related reports. To access to a report simply select the appropriate tab.

4.1 SCADA



4.1.1 Reports Description

The MW generation, load, HVDC and quality of data at each node in the transmission network as captured by the Remote Terminal Units and transmitted to the SCADA application. The generation, load and HVDC data is averaged over the half hour.

4.1.2 Instructions

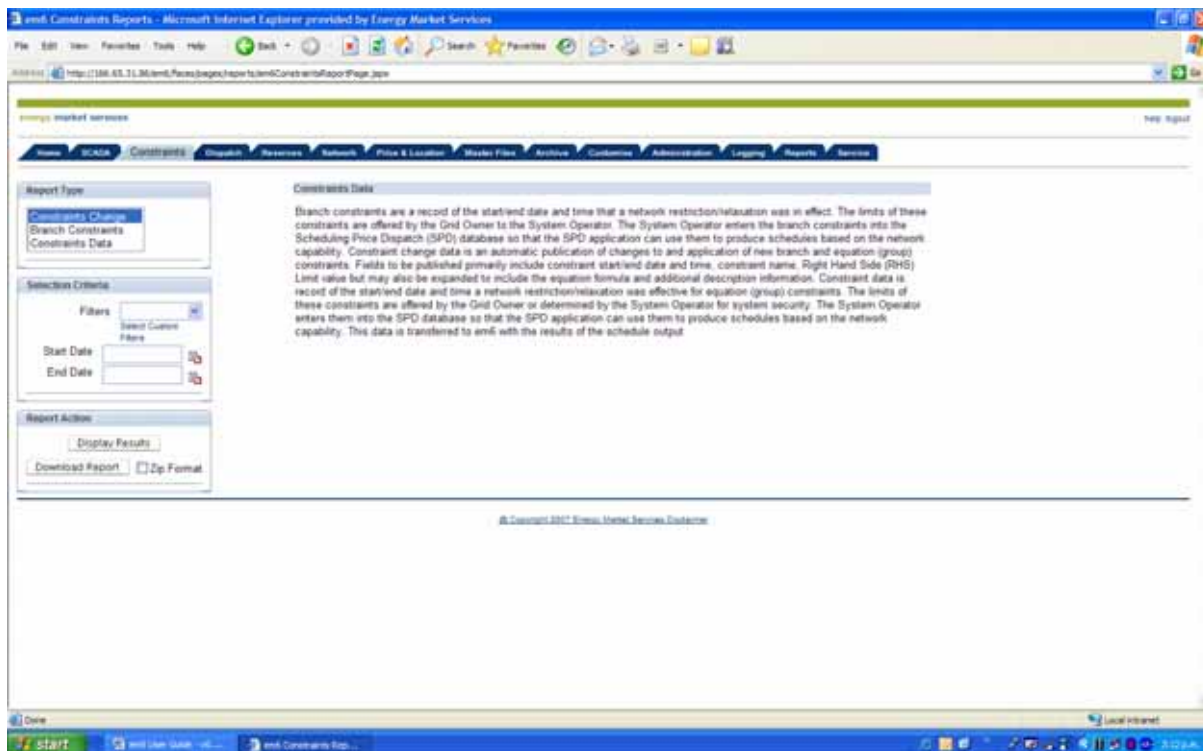
To download or view a report simply choose a report type from the drop down list, highlight the node(s), the start date and period and the end date and period and then click the either the *Display Results* or *Download Report* button.

Please Note: HVDC 'nodes' are not selectable; all four nodes will be returned in this report.



Tip: To select more than one node hold down the 'Ctrl' key and click each node you require.

4.2 Constraints



4.2.1 Reports Description

4.2.1.1 Branch constraints

Branch constraints are a record of the start/end date and time that a network restriction/relaxation was in effect. The limits of these constraints are offered by the Grid Owner to the System Operator. The System Operator enters the branch constraints into the Scheduling Price Dispatch (SPD) database so that the SPD application can use them to produce schedules based on the network capability.

4.2.1.2 Constraint change data

Constraint change data is an automatic publication of changes to and application of new branch and equation (group) constraints. Fields to be published primarily include constraint start/end date and time, constraint name, Right Hand Side (RHS) Limit value but may also be expanded to include the equation formula and additional description information.

4.2.1.3 Constraint data

This is record of the start/end date and time a network restriction/relaxation was effective for equation (group) constraints. The limits of these constraints are offered by the Grid Owner or determined by the System Operator for system security. The System Operator enters them into the SPD database so that the SPD application can use them to produce schedules based on the network capability. This data is transferred to em⁶ with the results of the schedule output.

4.2.2 Instructions

To download or view a report simply choose a report type from the drop down list, enter the start date and end date, and then click the *Display Results* or the *Download Report* button.

4.3 Dispatch



4.3.1 Reports Description

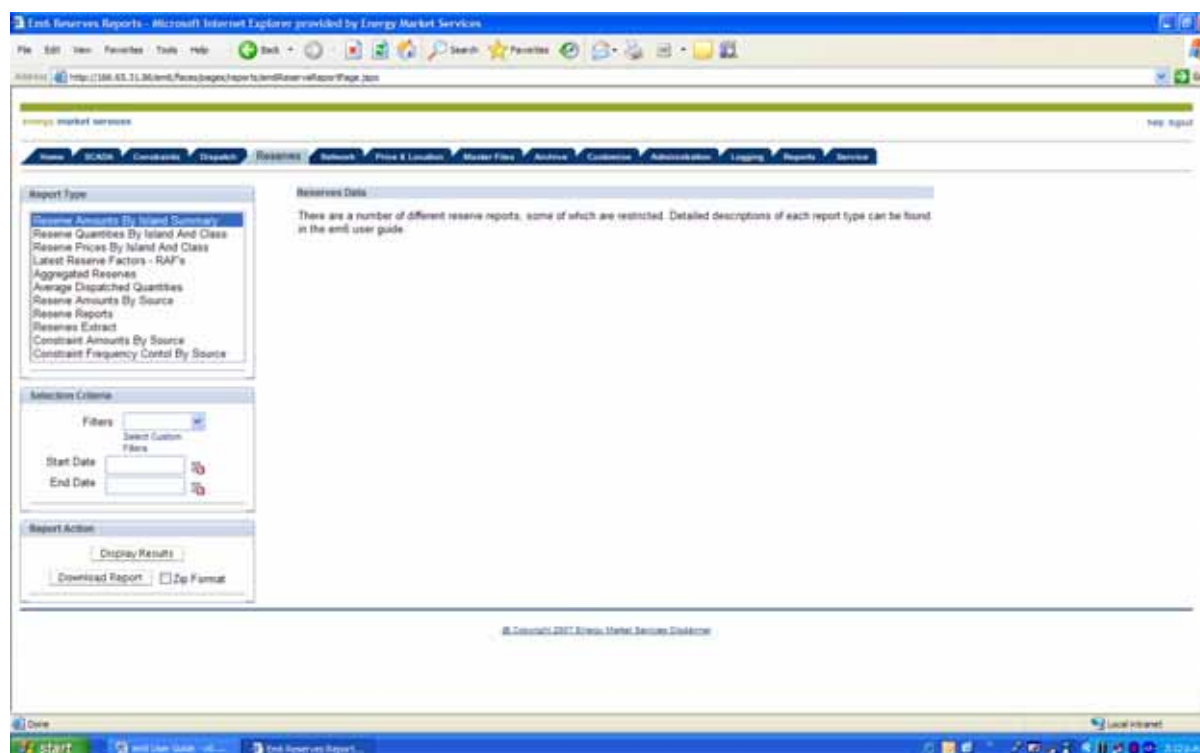
The dispatch report provides dispatch instructions sent from the Dispatcher.

4.3.2 Instructions

To download or view a report simply select the start and end dates, then click the *Display Results* or *Download Report* button.

Please Note: Dispatch data is restricted.

4.4 Reserves



4.4.1 Reports Description

There are a number of different reserve reports, some of which are restricted (denoted by *). Detailed descriptions of each report type are below.

4.4.1.1 Reserve amounts by island summary

This unrestricted report details the total MW Reserve by trading period and by Island. Data will be available on a monthly basis (during first few days of each month).

4.4.1.2 Reserve quantities by island and class

This unrestricted report details the total MW Reserve quantities by trading period and by Island and Class (Fast and Sustained). Data will be available on a monthly basis (during first few days of each month).

4.4.1.3 Reserve prices by island and class

This unrestricted report contains the final reserve price by island and class – fast and slow. Data will be available at end of every final and provisional pricing schedule.

4.4.1.4 Latest Reserve Factors – RAFs (Risk Adjustment Factors)

This unrestricted report provides fast and slow RAFs by island for each trading period. (The factors used in all solutions to ensure enough reserves available given largest risk).

RAFs are usually 1 or 0; if the RAF is not 0 then reserves have been scheduled. Sometimes reserves are called into operation (at times of extreme demand etc) but are recorded as 0. This is caused by the RAFs being read at the start of a trading period and in the trading period they may be called into operation.

4.4.1.5 Aggregated reserves

This is an unrestricted report of the Schedule of Dispatch Prices and Quantities (SDPQ) results for total MW cleared and total MW offered by island and type – I, T, P, Fast or Slow. Data will be available in line with PDS and SDPQ, and final and provisional pricing runs.

4.4.1.6 Average dispatched quantities*

This is a restricted report of partly loaded spinning reserve (PLSR), tailwater depression (TWD), & interruptible load (IL) which is run at the end of the month, ready for constrained amount calculations.

4.4.1.7 Reserve amounts by source*

This is a restricted report that provides quantity and price - amount to be paid to each participant. The data will be available monthly, once the previous month's data becomes available.

4.4.1.8 Reserve Reports*

This is a restricted report that provides summary of the amounts to be paid by island, type and trading period and the quantities and prices by type and island for each market participant. The data will be available monthly, once the previous month's data becomes available.

4.4.1.9 Reserves extract*

This is a restricted report of the quantities and final prices, by reserve type and class. The data will be available monthly, once the previous month's data becomes available.

4.4.1.10 Constraint amounts by source*

This is a restricted report of calculated constrained on/off amounts by source.

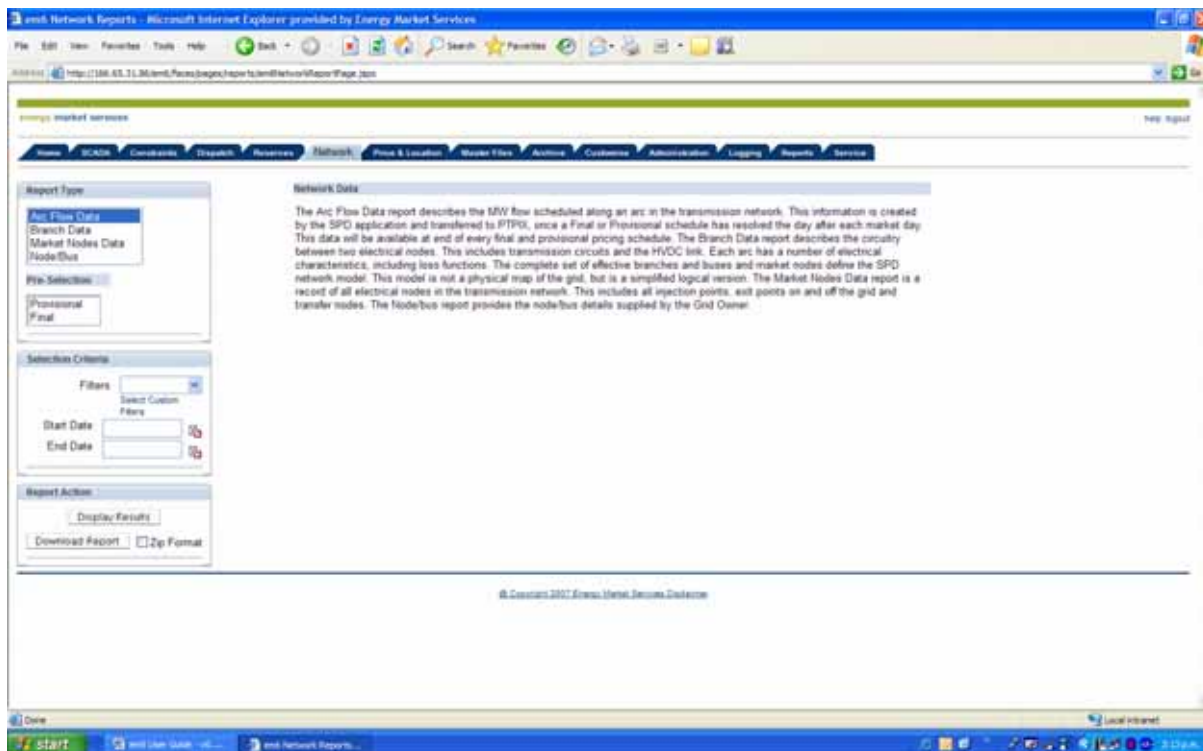
4.4.1.11 Constraint reports*

This is a restricted report of frequency control by source.

4.4.2 Instructions

To download or view a report simply choose a report type from the drop down list, select the pre-selection (if relevant), enter the start date and end date, then click the *Display Results* or *Download Report* button.

4.5 Network



4.5.1 Reports Description

There are a number of different network reports. Detailed descriptions of each report type are below.

4.5.1.1 Arc Flow Data

This report describes the MW flow scheduled along an arc in the transmission network.

This information is created by the SPD application and transferred to PTPIX, once a Final or Provisional schedule has resolved the day after each market day. This data will be available at end of every final and provisional pricing schedule.

4.5.1.2 Branch Data

This report describes the circuitry between two electrical nodes. This includes transmission circuits and the HVDC link. Each arc has a number of electrical characteristics, including loss functions. The complete set of effective branches and buses and market nodes define the SPD network model. This model is not a physical map of the grid, but is a simplified logical version. Any changes will appear shortly after we receive an update from Transpower.

4.5.1.3 Market Nodes Data

This report is a record of all electrical nodes in the transmission network. This includes all injection points, exit points on and off the grid and transfer nodes. Any changes will appear shortly after we receive an update from Transpower.

4.5.1.4 Node/bus

This report provides the node/bus details supplied by the Grid Owner. Any changes will appear shortly after we receive an update from Transpower.

4.5.2 Instructions

To download or view a report simply choose a report type from the drop down list, select the pre-selection (if relevant), enter the start date and end date, then click the *Display Results* or *Download Report* button.

4.6 Price & Location



4.6.1 Reports Description

This is the location factor and market price calculated by Scheduling Pricing and Dispatch (SPD) software.

Location factor and market price are calculated for every commercial node (i.e. grid injection or grid exit point) for every period over which the SPD application is run. They are produced for the SDPQ, PDS, Provisional and Final Price schedule types. Final and Provisional prices are created daily.

The Reserve Price is the reference price created by SPD for each of the reference nodes. This is HAY2201 for the North Island and BEN2201 for the South Island. Reserve prices are created using the same schedules conditions and run types as the market prices.

4.6.2 Instructions

To download or view a report simply choose a report type from the drop down list, select the pre-selection, enter the start date and period and end date and period, then click the *Display Results* or *Download Report* button.

4.7 Master Files



4.7.1 Reports Description

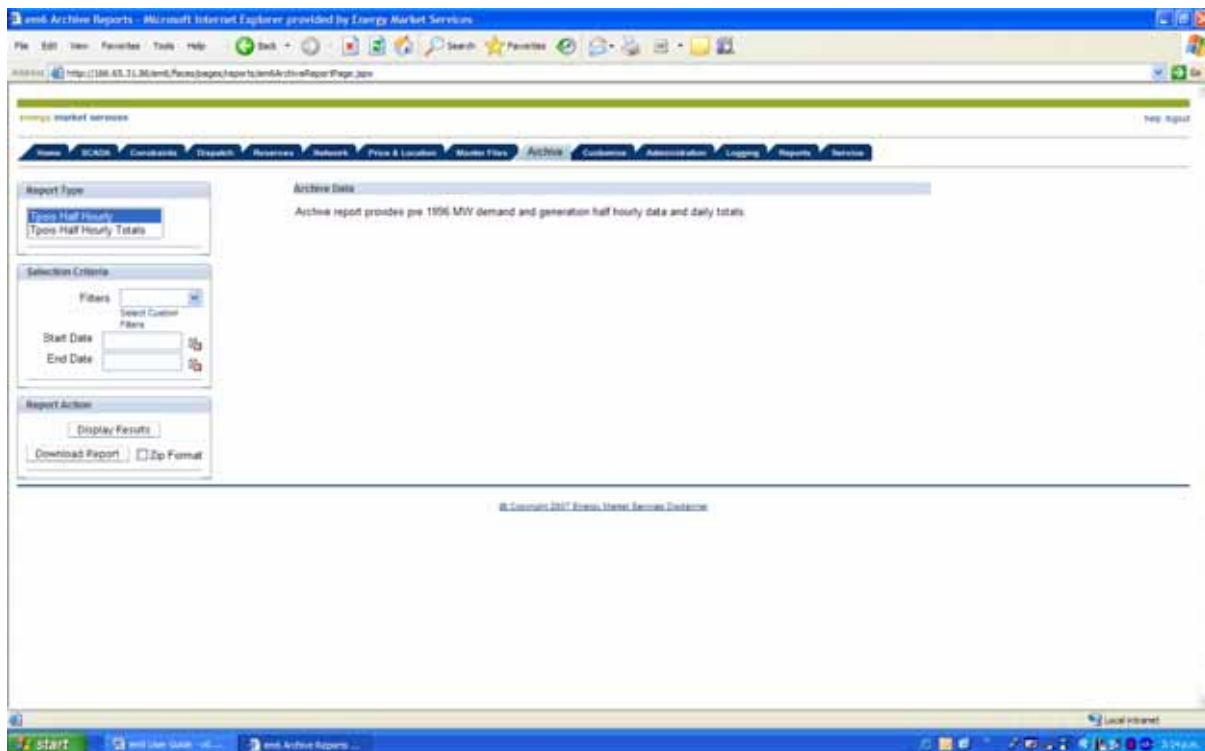
Master Files are the largely unused, static records that relate to data within the em⁶ application.

- **Calendar Entries** - This is a report of specific infrequent events.
- **Code Table** - The code table is a listing of predefined single character codes and their descriptions that are used by the em⁶ application.
- **Code Type Table** - This table contains code type and description for all the code types used in the code table.
- **Locations Data** - This is a record of all Transpower locations, including nodes, regions, area control centres, block dispatch codes and islands.
- **Party Data** - This is a record of all parties, both market and non-market for whom injection, extraction or trading of electricity may be an activity.
- **Trader Agreements** - This is a restricted report. Details include agreement number and start date for each market participant.
- **Trader Parents** - This report details the Trader hierarchy for each market participant.

4.7.2 Instructions

To download or view a report simply choose a report type from the drop down list and then click the *Display Results* or *Download Report* button.

4.8 Archive



4.8.1 Reports Description

This report provides pre 1996 MW demand and generation half hourly data and daily totals.

4.8.2 Instructions

To download or view a report simply choose a report type from the drop down list, select the pre-selection, then click the *Display Results* or *Download Report* button.

5. em⁶ Functions

5.1 Customise Tab

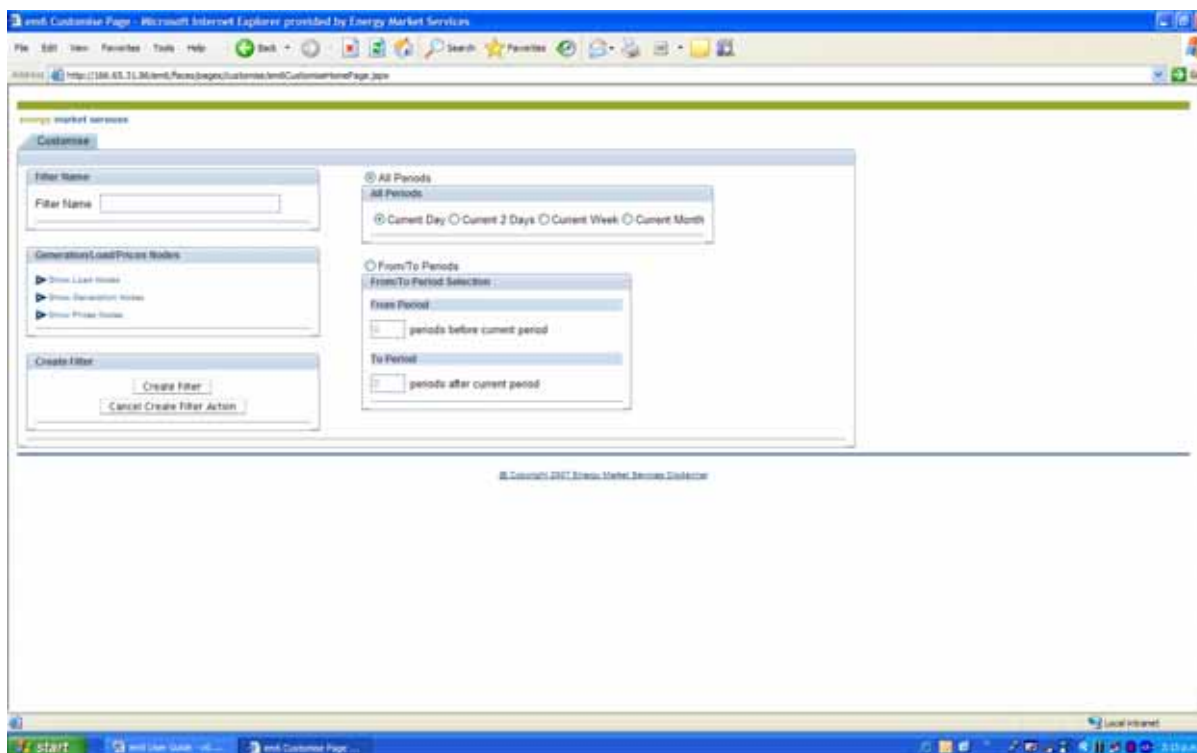
5.1.1 Description

The customise service allows users to create; edit and delete remove personal filters. Filters are a convenient method of pre-populating the selection criteria in a number of reporting pages. The filter must contain a start and end date as well as a period selection. Load, generation or price nodes of interest to the user can be optionally added to the filter.


The service also allows users to customise the input domains and periods for the graphs on the home page. This includes the load, generation and price nodes, with the date and period start and end times. On entering the home page, users with the customisation service will have a selection criteria box available and both the graphs and the fields within the selection criteria will be updated to match the filter settings.


5.1.2 Instructions

The user is able to create a new filter by clicking the *New Filter* button. This will take the user to the *Create Filter* page.



To set up a new filter simply enter a unique filter name; select the generation, load or price nodes of interest, select one of the predefined 'all periods' options or enter a 'rolling window' of before and after periods.

 Tip: Current day/week/month or previous 2 days filter selection will return all the trading periods for the selected dataset from the first trading period of the current day. The 'from/to' period option will return periods before and after the current (at the time of viewing the report) trading period.

 Tip: The graphs on the homepage are also set up in the same way as filters from the customise tab. Simply select the homepage filter and edit as per the instructions above. Each time the homepage is opened your personal homepage filter will override the generic homepage view.

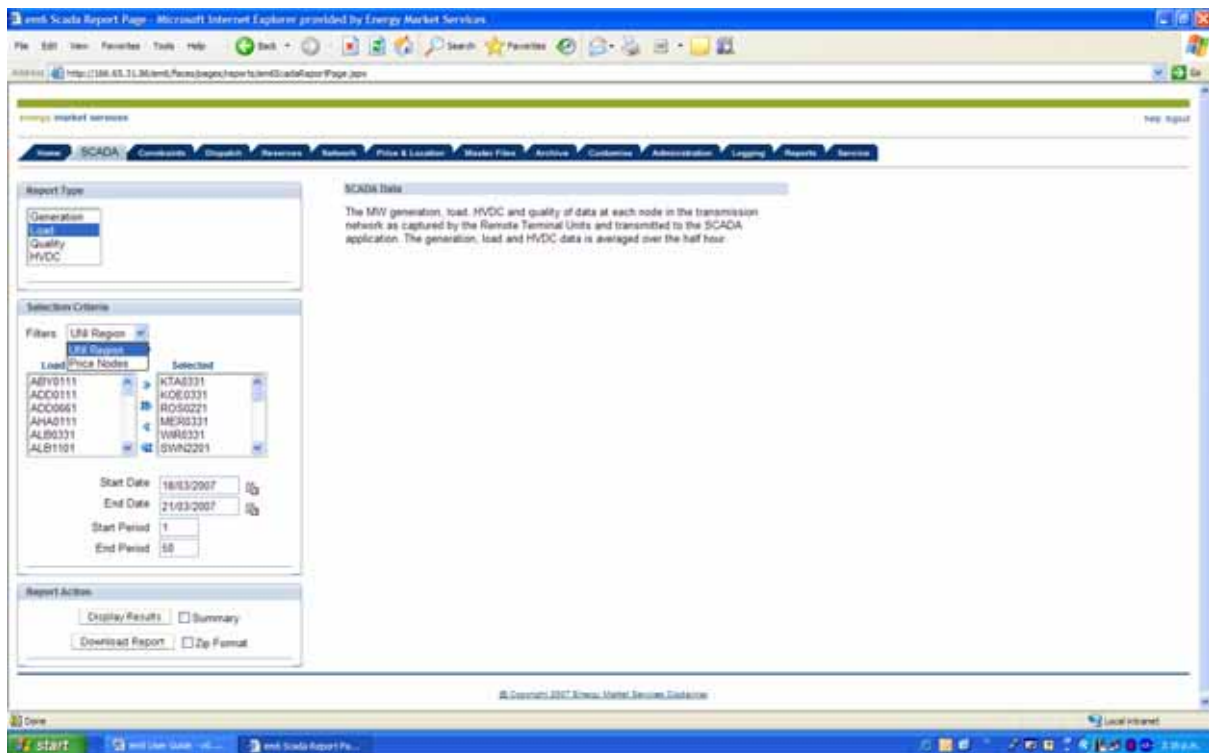
5.2 Filters in Use

5.2.1 Description

Filters that have been created will be visible as a selectable list box on all report pages where a selection criteria box is present.

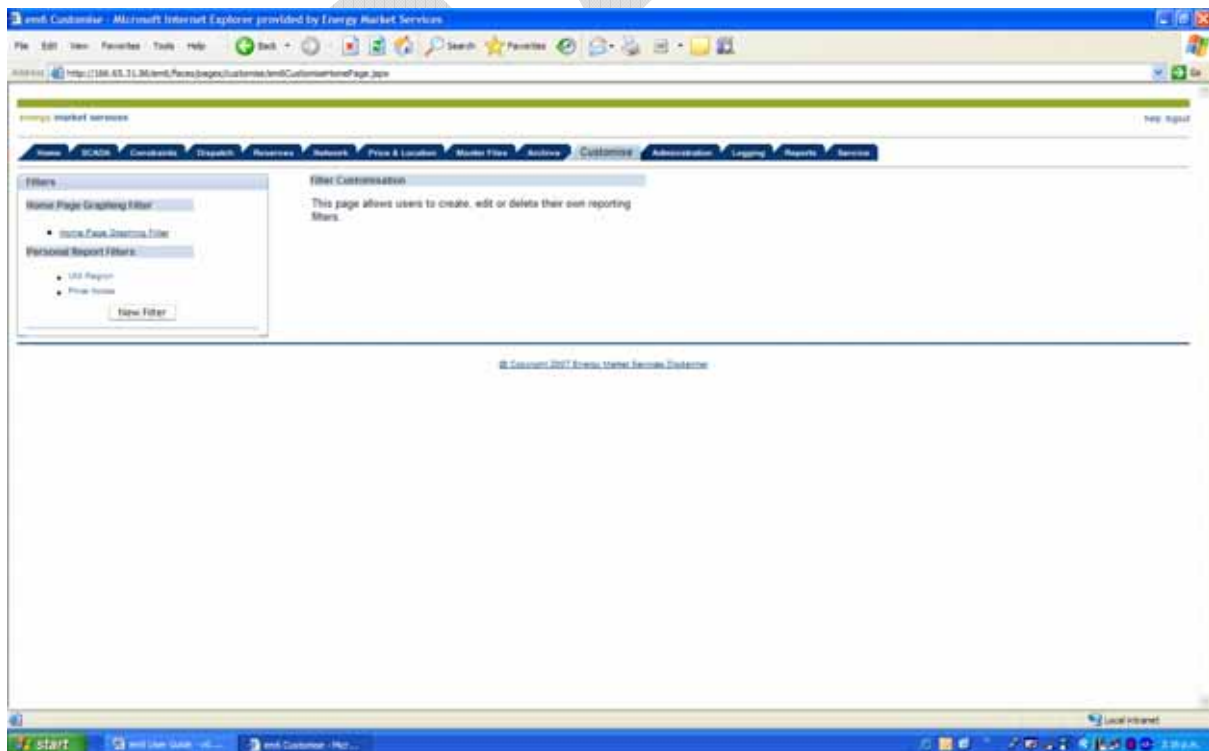
5.2.2 Instructions

To apply a filter, simply select the filter from the drop-down box and click *Display Results* or *Download Report*. The selection of a filter will automatically update any relevant parameters in the selection criteria to match the filter settings.



💡 Tip: It is possible to create *Date Filters* which applies only a date range to the selection criteria. It is possible to navigate to any report that has selection criteria and apply the date filter. The filter dates will then be populated.

5.3 Editing Filters

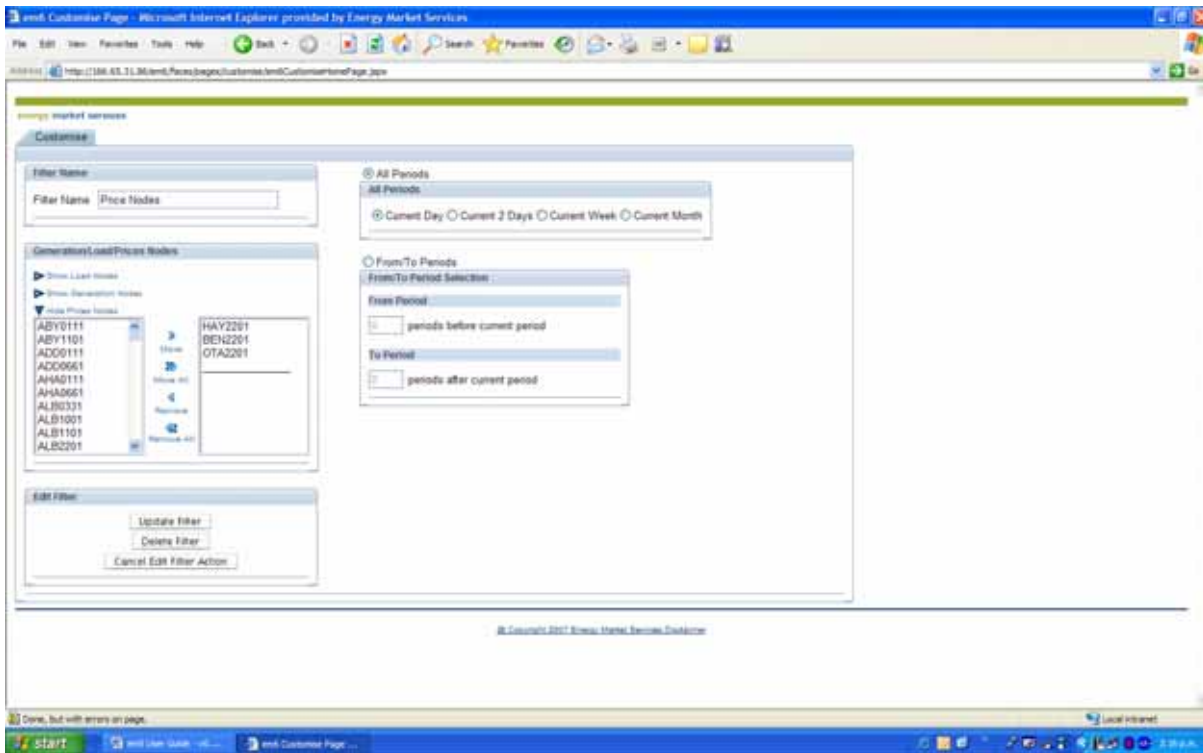


5.3.1 Description

It is possible to update or delete filters. The *Display Filters* page will be presented to the user on first entering the customisation tab.

5.3.2 Instructions

Simply select the filter to be edited, make the appropriate changes and click *Update*, *Delete* or *Cancel*.



6. Appendix 1 – Field Names

The following section is designed to provide a description of the fields that make up the output data files from em⁶. They are listed alphabetically below.

[Insert field names and descriptions]

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