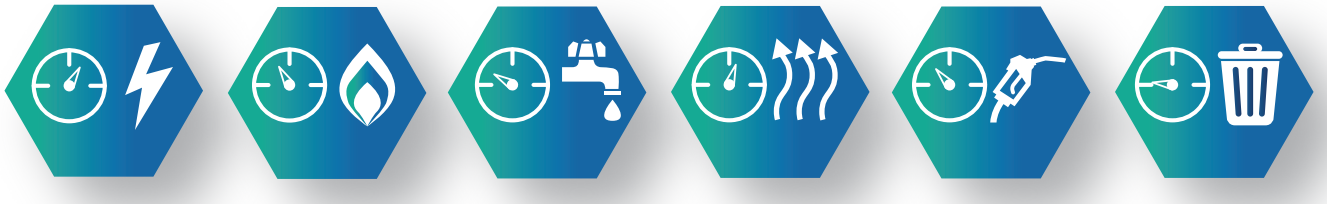
Energy Management System Application Sheet

Optergy

Optergy Enterprise + Proton

Optergy Energy Management System (EMS) software allows facility managers and tenants to manage utilities and submeter consumption live through a web-browser or mobile app.



Electricity Meter | Gas Meter | Water Meter | Thermal Meter | Diesel Meter | Waste Meter

Energy Management

Visibility is the key to implementing sustainability initiatives in the built environment. What is not measured cannot be managed. Optergy provides the ability to visualize and report utility and sub meter data in real time. Displays can be created that provide an overview of utility performance with the ability to drill deeper for investigation purposes, enabling fault diagnosis fast. User specific reports for major building load groups or individual meters can be automatically generated and emailed via CSV or PDF. Out of normal condition alarming provides instant notification when problems arise.

The mobile app for Android and IOS allows users to view reports, alarms and energy overview data from a single tenant, building or a portfolio of buildings in real time.

Energy Types

- Electricity
- Gas
- Water
- Thermal (chilled & hot)
- Diesel
- Waste

Meter Management

- Add/Edit/View meters
- Physical meters
- Virtual meters
- Manual entry meters
- Meter displays and status
- Custom meter points
- Meter alarms
- Energy log management
- Meter type management
- Meter templates
- Meter hierarchy management

Example meter custom display dashboard comparing utilities week on week and monthly consumption versus outside air temperature.

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Simple Meter Configuration

Step 1	Define meter name
Step 2	Select utility type
Step 3	Define meter hierarchy
Step 4	Select communication method
Step 5	Select meter type template
Step 6	Set meter alarms
Step 7	Assign user access

Meter Types

Physical Meters
Adding a physical meter the software is to communicate with.

Forecast Meter
Users can define forecast data to be entered. This function allows a forecast values to be tracked against actual for comparison.

Manual Meter
Users can enter manually meter data. For example; a meter that is created using data received from only monthly utility bills which must be manually entered. Bulk data upload can be done via CSV.

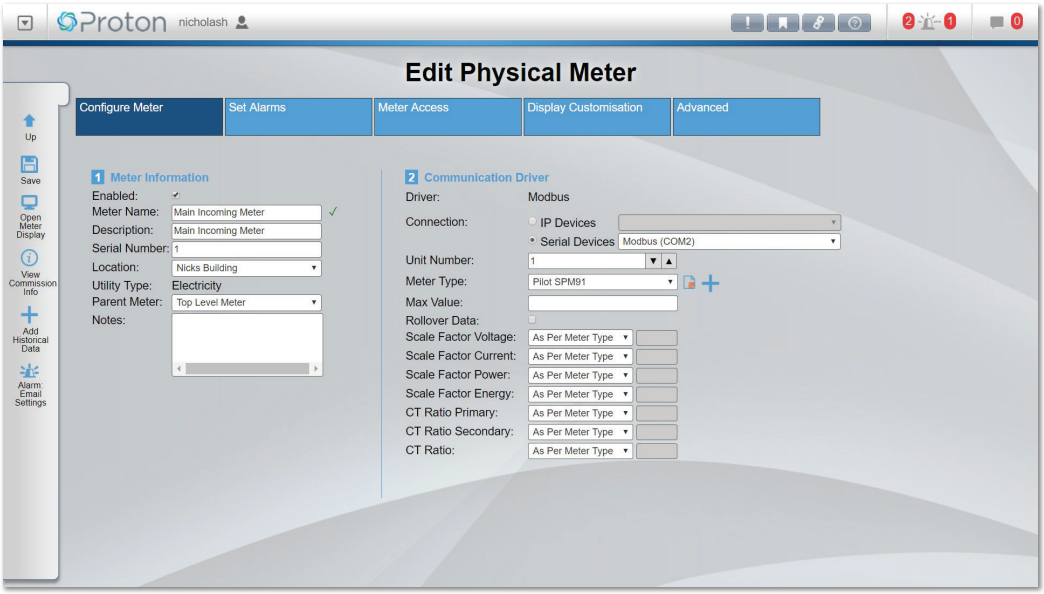
Calculation Meter Types

Aggregate
An aggregate meter is the sum of all associated meters.

Custom
Custom calculation meters require the calculation expression or equation to be defined. Available calculation operators are +, -, *, /, ().

Portion
A portion meter is configurable to a specified percentage of a given parent meter.

Remainder
A remainder meter is the remainder of a parent meter minus its child meters.



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Meter Communication

The Optergy software can communicate to meters via the following methods:

- Modbus RTU
- Modbus TCP/IP
- BACnet MSTP
- BACnet IP

Specific Meter Drivers

There are four specific meter drivers built into the Optergy base license.
This allows Optergy to communicate via proprietary manufacturer protocols to the following meters:

- IME Nemo 96HD with IF96012 Memory module
- Novus DigiRail 4C

Meter Type Templates

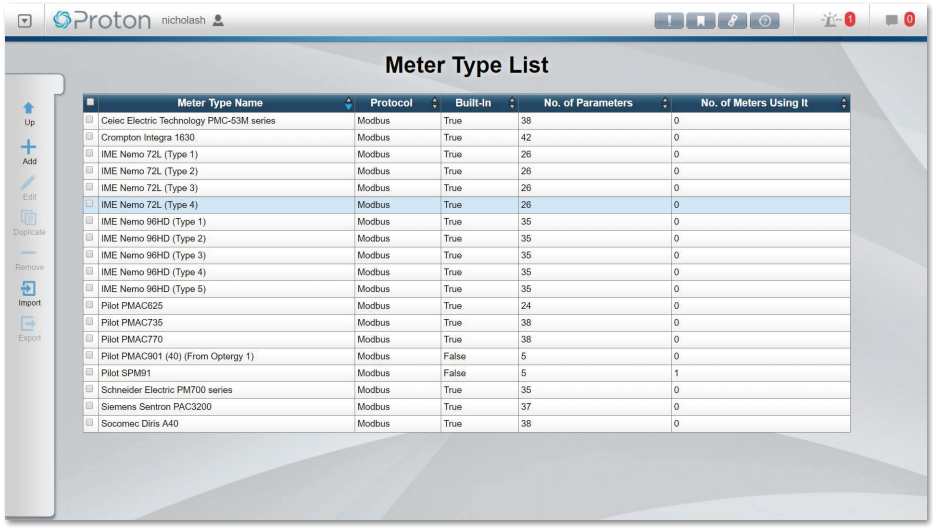
Meter type templates can be created and saved for the following utility types:

- Electricity
- Gas
- Water
- Diesel
- Thermal energy (chilled & hot)

Optergy has 17 Modbus meter type templates saved as standard. Standard templates included in Optergy's base license are for the following meter types:

- Ceice Electric Technology PMC-53M Series
- IME Nemo 72L
- Pilot PMAC625
- Pilot PMAC770
- Siemens Sentron PAC3200
- Crompton Integra 1630
- IME Nemo 96HD
- Pilot PMAC735
- Schneider Electric PM700 Series
- Socomec Diris A40

If a meter type does not exist as a standard, the user can create their own BACnet or Modbus meter type template. These templates can be exported/imported for easy setup on multiple projects.



Meter Type Name	Protocol	Built-In	No. of Parameters	No. of Meters Using It
Ceiec Electric Technology PMC-53M series	Modbus	True	38	0
Crompton Integra 1630	Modbus	True	42	0
IME Nemo 72L (Type 1)	Modbus	True	26	0
IME Nemo 72L (Type 2)	Modbus	True	26	0
IME Nemo 72L (Type 3)	Modbus	True	26	0
IME Nemo 72L (Type 4)	Modbus	True	26	0
IME Nemo 96HD (Type 1)	Modbus	True	35	0
IME Nemo 96HD (Type 2)	Modbus	True	35	0
IME Nemo 96HD (Type 3)	Modbus	True	35	0
IME Nemo 96HD (Type 4)	Modbus	True	35	0
IME Nemo 96HD (Type 5)	Modbus	True	35	0
Pilot PMAC625	Modbus	True	24	0
Pilot PMAC735	Modbus	True	38	0
Pilot PMAC770	Modbus	True	38	0
Pilot PMAC901 (40) (From Optergy 1)	Modbus	False	5	0
Pilot SPM91	Modbus	False	5	1
Schneider Electric PM700 series	Modbus	True	35	0
Siemens Sentron PAC3200	Modbus	True	37	0
Socomec Diris A40	Modbus	True	38	0

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Automatic Meter Reading

The automatic meter reading function provides users with the ability to select individual meters and generate summary reports as CSV or PDF.

The report includes information such as a selected date (based on a time period selected by the user), the meter name, serial number, and the meter reading. These reports can be sent to users via email automatically as CSV or PDF.

Automatic meter readings can be used where a building owner recovers utility costs from tenant through their lease agreement without the need for a formal utility bill.

Proton By Optergy

Automatic Meter Reading
January 1, 2018

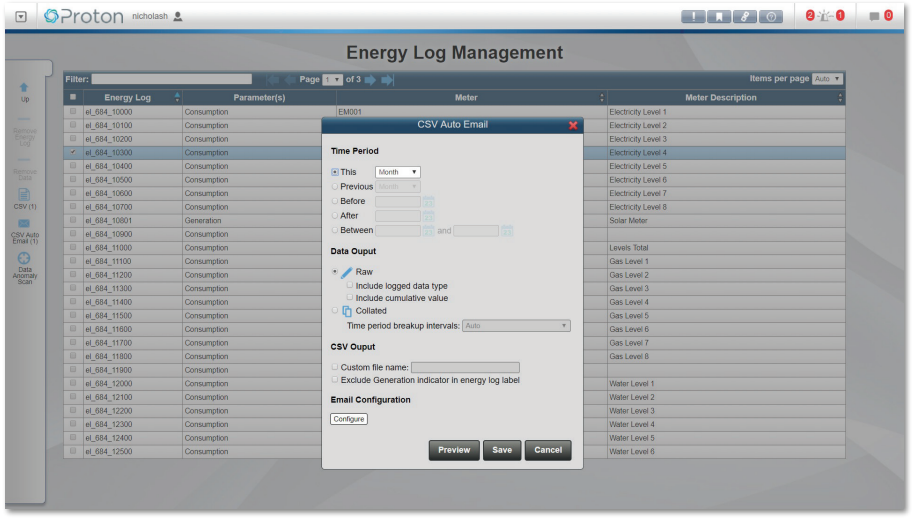
Date	Meter	Serial Number	End Meter Reading
01/14/2018 5:00 PM	Aggregate Electricity Meter (Consumption)		460,607.36 kWh
01/14/2018 5:00 PM	Aggregate Gas Meter (Consumption)		514,050.59 m^3
01/14/2018 5:00 PM	Aggregate Water Meter (Consumption)		555,527.18 l

Energy Log Management

The energy log management page shows the user a list of all current energy logs recorded in the Optergy database. The list shows each energy log's name, parameter and description.

The Optergy software has built-in functionality to scan for data anomalies; such as temporarily spikes and drops in data that are occasionally caused by malfunctioning metering hardware. This scan can check all energy logs or just those selected from the table.

Users can remove abnormal data via user selectable time period, or upload data via CSV. Energy logs can be automatically emailed for a user defined period as raw 15 minute interval data or by user selectable break up intervals. For example; reading totals for daily, weekly, monthly or yearly.

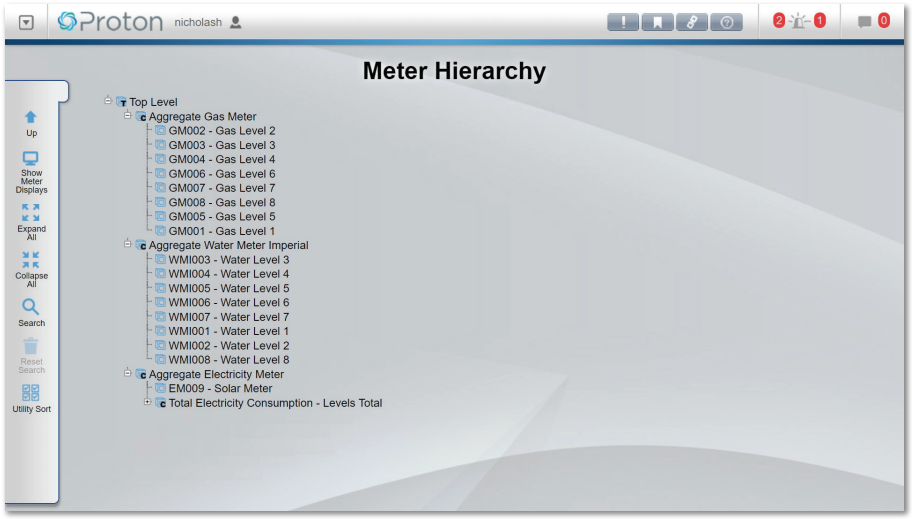


Meter Hierarchy Management

The meter hierarchy page loads a graphical tree list displaying the parent/child relationships of all the meters currently in Optergy software.

When a user right clicks on a meter a drop down quick link menu will link the user to further information including:

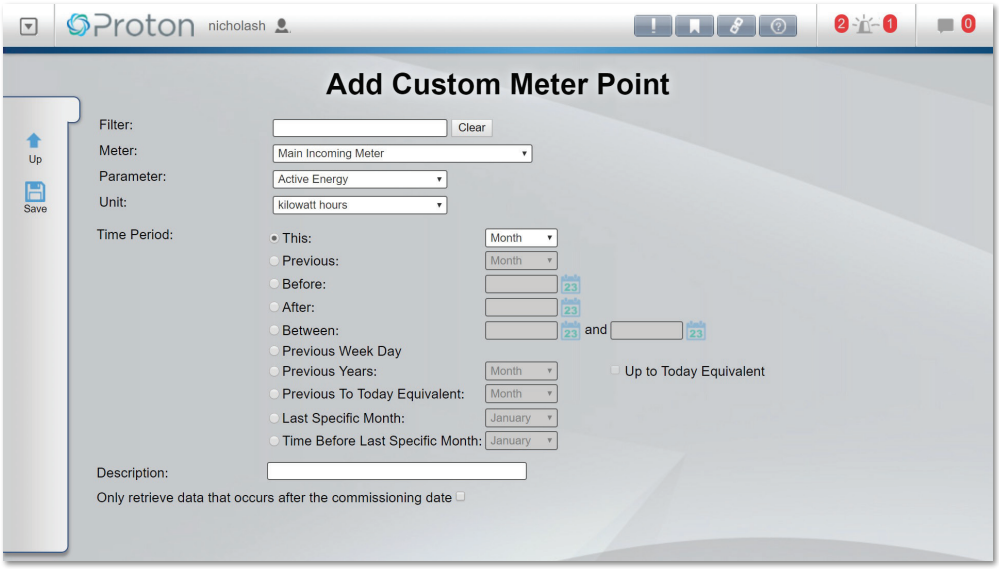
- Meter breakdown report (only available for parent meters)
- Meter configuration
- Meter commissioning history



Custom Meter Points

Custom meter points allow the user to create a BACnet point to view cumulative data for a meter within a user defined time period. For example, the user can create a custom meter point to view consumption for the previous day, week, month or year. The custom meter point's data is stored as a BACnet Analog Input (AI) which can be trend logged, displayed on a graphic display, energy dashboard, and reports.

Custom meter points are updated every 15 minutes.



Meter Alarms

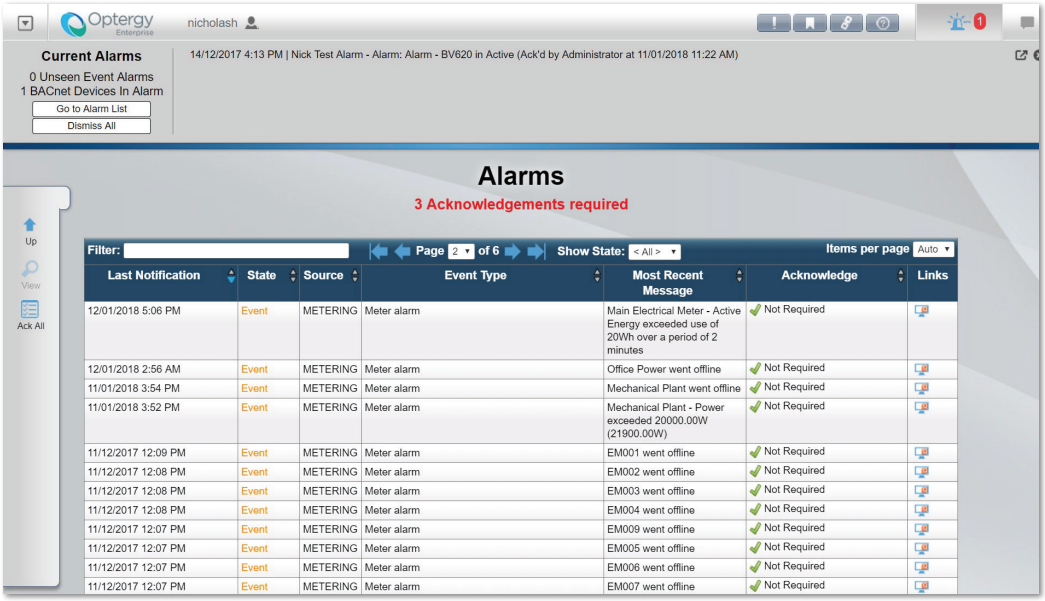
Optergy software allows users to configure alarms for meters. Users can be notified of new metering alarms in three ways:

- Appear and be displayed in the Optergy software banner
- Received as alarm emails with URL link to the meter in alarm
- Notification via Optergy mobile app banner alert

Alarm conditions include:

- Configuration changed
- Meter online
- Meter offline
- Instantaneous maximum and minimum values
- Consumption over interval
- Consumption over time
- Outside tolerance levels

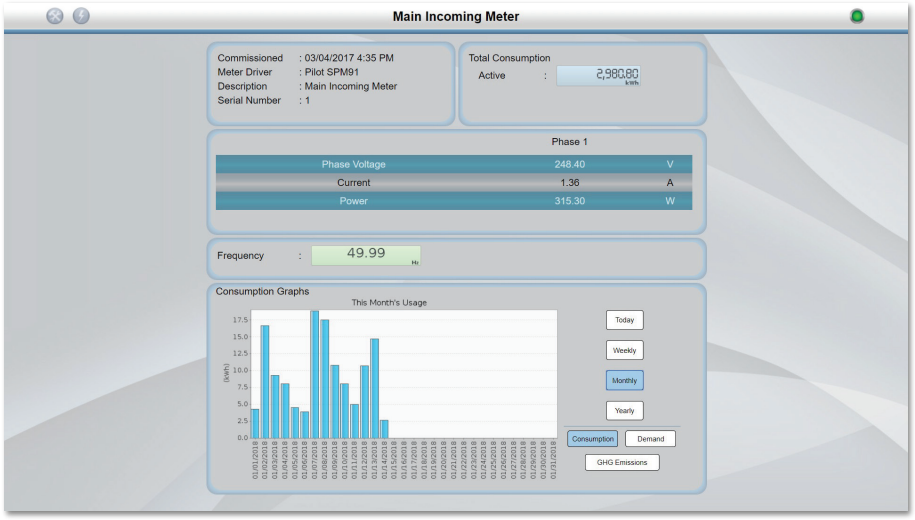
Adjustable alarming conditions allows users to create context around the alarms being generated.
For example; if a cooling tower top meter is installed, the user can define alarms that identify unusual water consumption outside of normal operating hours. This can identify if the typical ball valve and float water top up has failed open or closed.



Last Notification	State	Source	Event Type	Most Recent Message	Acknowledge	Links
12/01/2018 5:06 PM	Event	METERING	Meter alarm	Main Electrical Meter - Active Energy exceeded use of 20Wh over a period of 2 minutes	Not Required	
12/01/2018 2:56 AM	Event	METERING	Meter alarm	Office Power went offline	Not Required	
11/01/2018 3:54 PM	Event	METERING	Meter alarm	Mechanical Plant went offline	Not Required	
11/01/2018 3:52 PM	Event	METERING	Meter alarm	Mechanical Plant - Power exceeded 20000.00W (21900.00W)	Not Required	
11/12/2017 12:09 PM	Event	METERING	Meter alarm	EM001 went offline	Not Required	
11/12/2017 12:08 PM	Event	METERING	Meter alarm	EM002 went offline	Not Required	
11/12/2017 12:08 PM	Event	METERING	Meter alarm	EM003 went offline	Not Required	
11/12/2017 12:08 PM	Event	METERING	Meter alarm	EM004 went offline	Not Required	
11/12/2017 12:07 PM	Event	METERING	Meter alarm	EM009 went offline	Not Required	
11/12/2017 12:07 PM	Event	METERING	Meter alarm	EM005 went offline	Not Required	
11/12/2017 12:07 PM	Event	METERING	Meter alarm	EM006 went offline	Not Required	
11/12/2017 12:07 PM	Event	METERING	Meter alarm	EM007 went offline	Not Required	

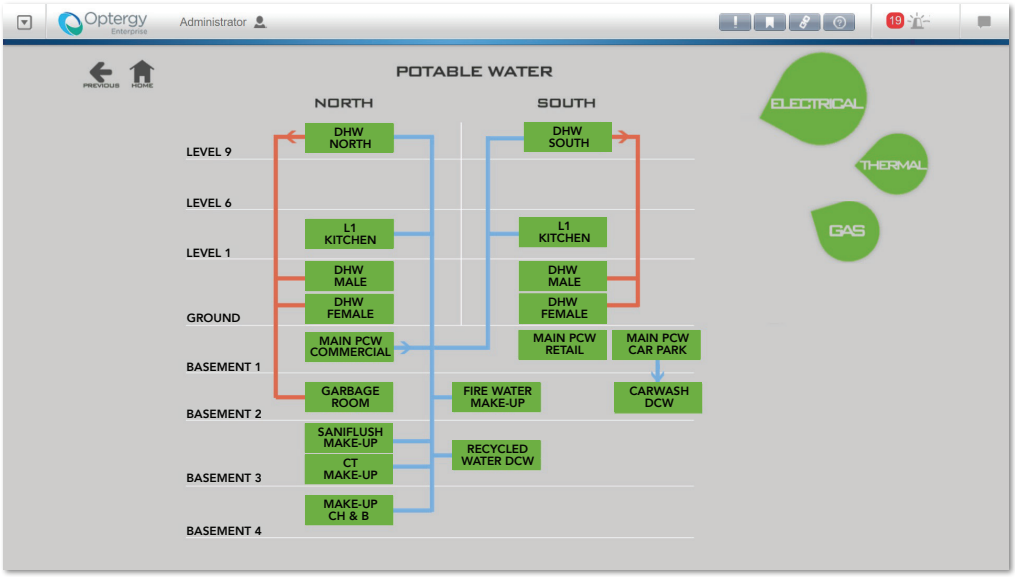
Meter Display Templates

Once a meter is set up in the Optergy software, a meter display page is automatically created based on the data available as defined by the meter type template. All data points on the meter display page are automatically logged so that engineering time is kept to a minimum during project delivery. Users can toggle the prebuilt report from day, week, month, year, consumption, demand or carbon emissions.



Custom Displays - Single Line Diagrams

Using Optergy's built-in display tool users can create custom display pages to represent a the flow of utilities throughout a building. This could be in the form of a single line diagram or by load group. For example; electricity can be grouped into loads like – lighting, general power, lifts/elevators, HVAC, general fans. Water loads can be grouped into loads like – cooling towers, toilets potable or domestic hot water.



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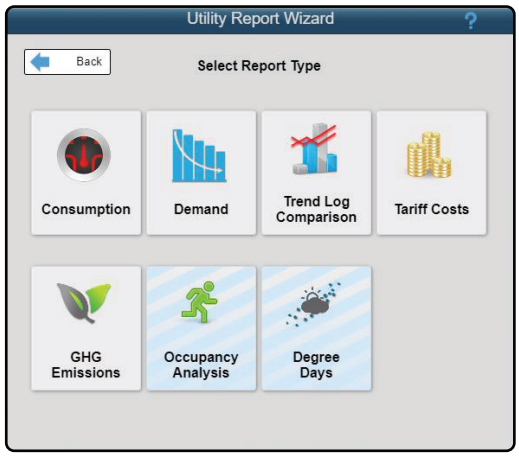
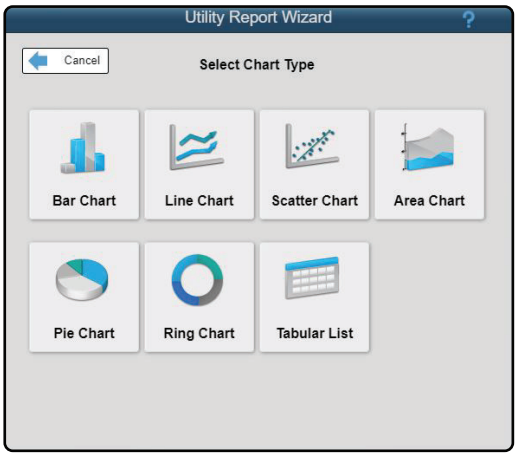
Custom Reporting Wizard

Step 1

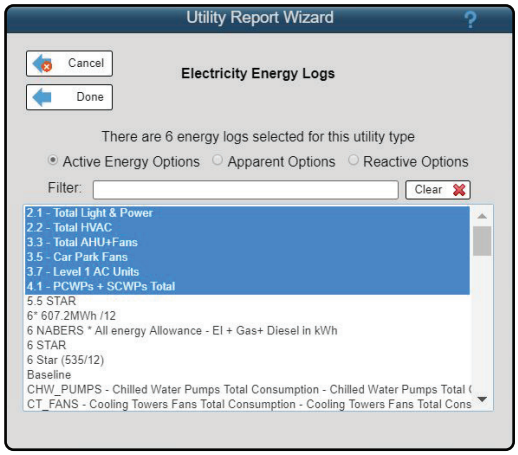


Step 2

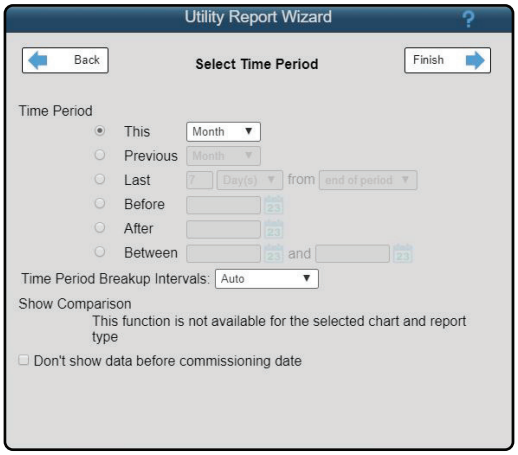


Step 3

Step 4



Step 5



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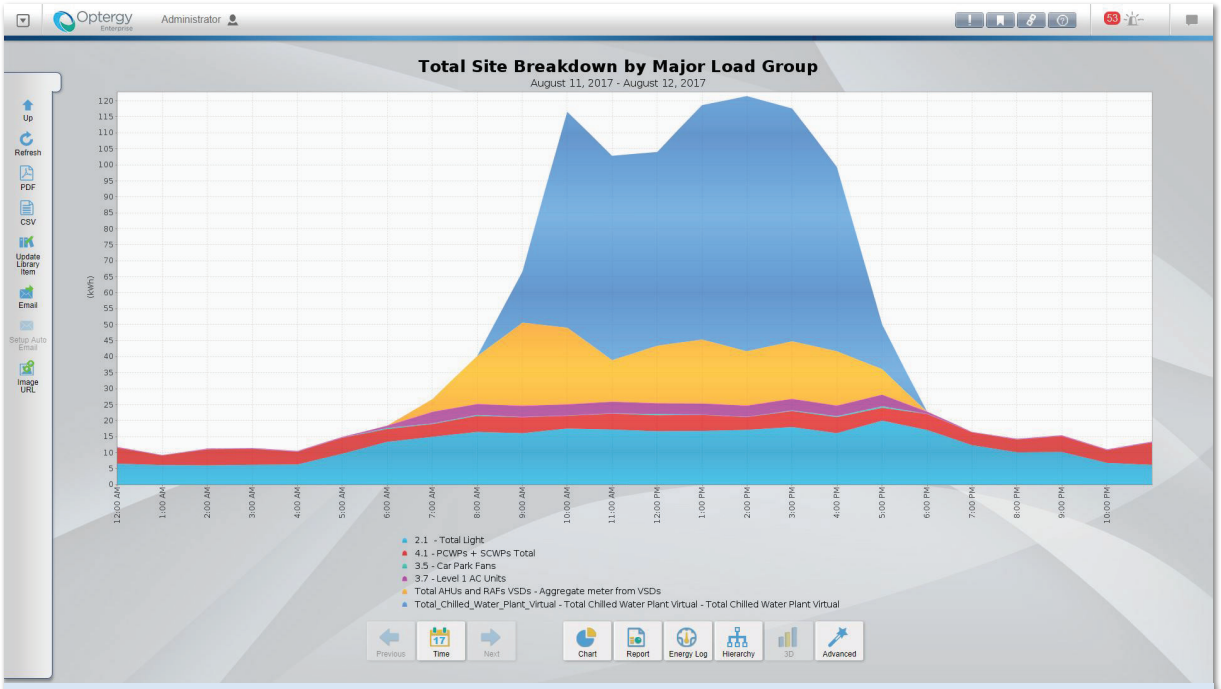
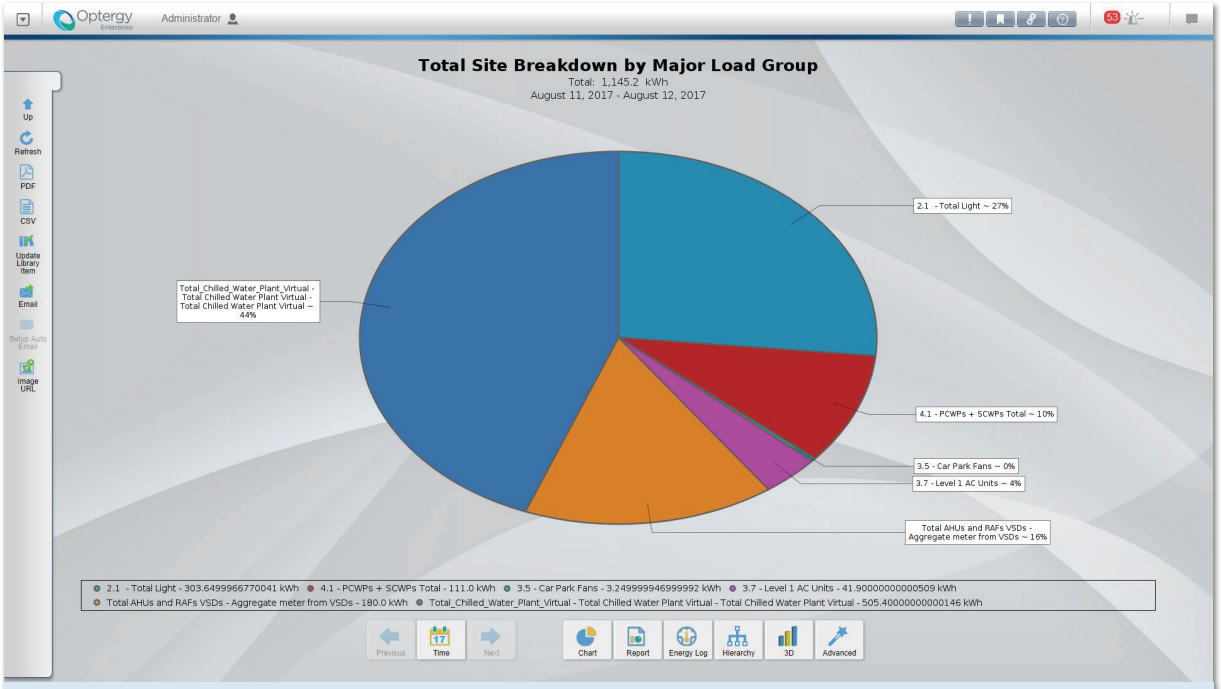
Example Custom Reports



Example area chart report showing 24 hour energy breakdown by major load group.



Example pie graph showing percentage energy breakdown by major load group.

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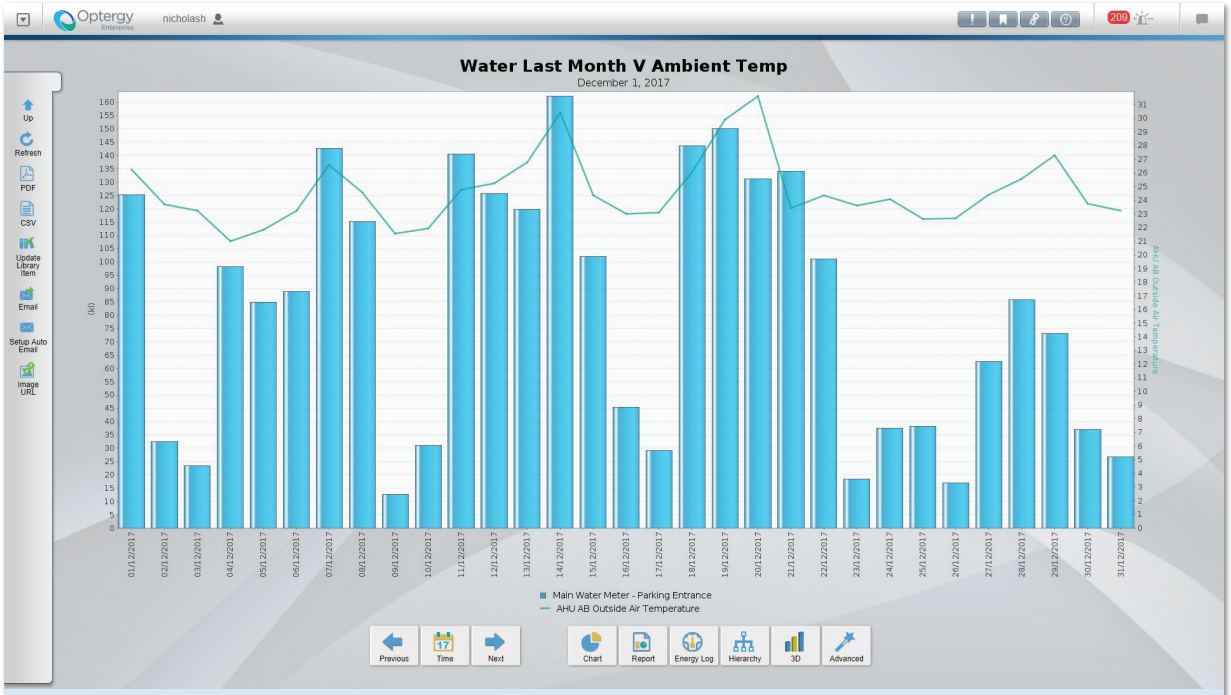
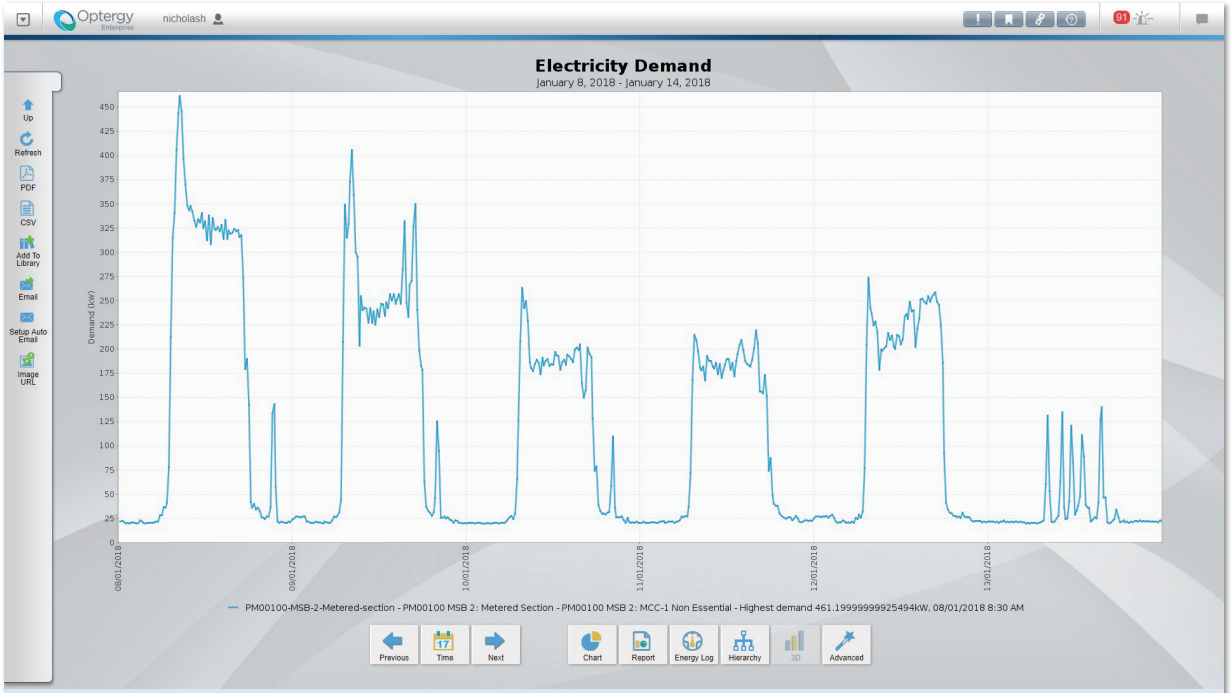
Example Custom Reports



Example bar chart report showing one months water use by day compared to outside air temperature.



Example line chart showing the demand profile over a one week period.

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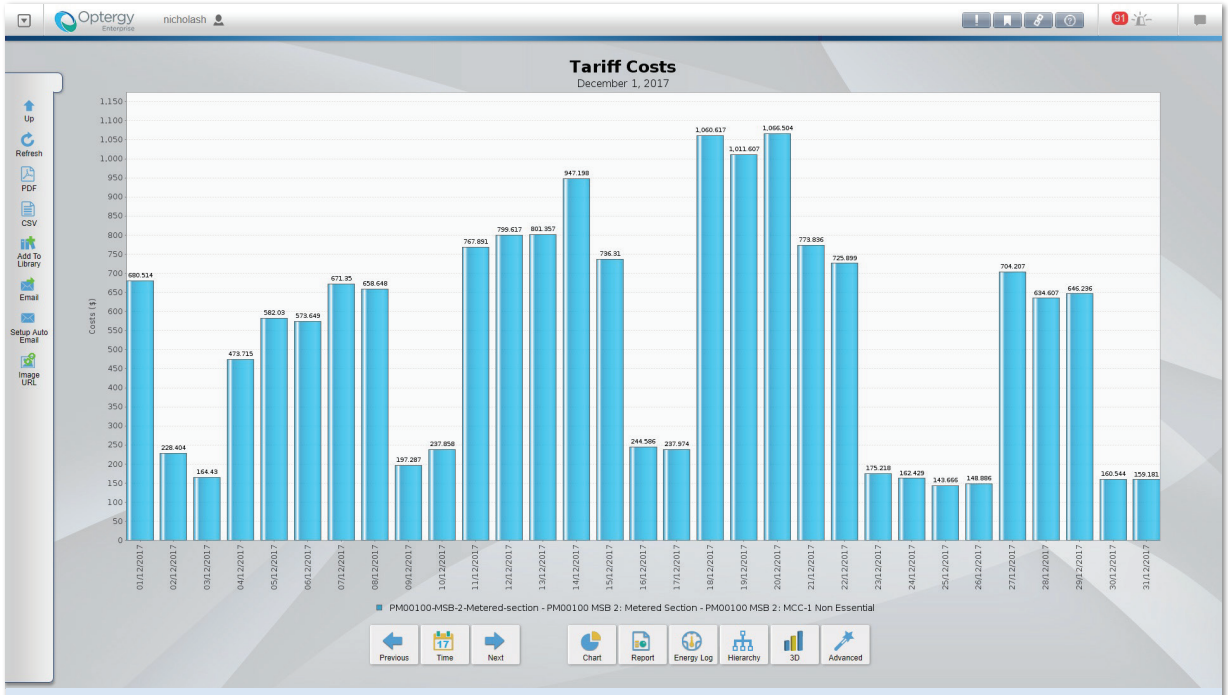
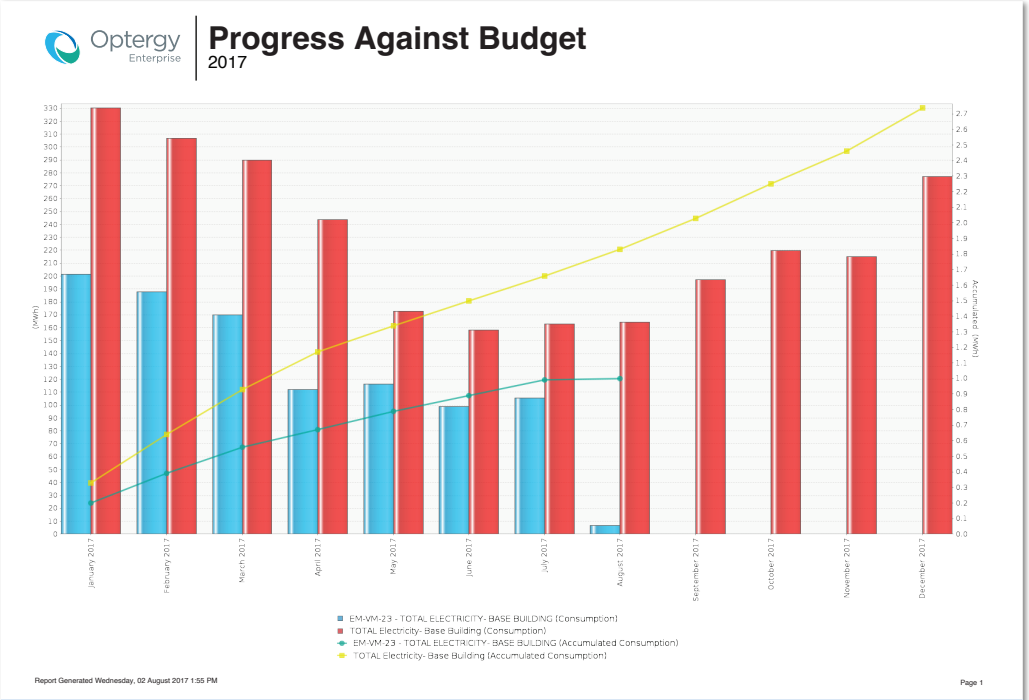
Example Custom Reports



Example tariff cost report showing electricity costs per day over a month.



Example progress against forecast meter showing actual energy versus a manually entered forecast.