Results Visualization Guide

The **Results Visualization Guide** is also available within the **Simergy Help** CHM file that is available within Simergy , and is located in the Introduction chapter.

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Results Visualization Guide

If you have a need and interest to interrogate results for a single simulation result set or to compare multiple result sets to each other, you should get familiar with Results Visualization. The data visualization capabilities within Results Visualization allows you to explore the output variables individually, in groups and across multiple design alternatives. You can use the predefined Results Screen Templates that include up to four pre-defined views of graphed output variables to quickly start the "deep dive" or you can create and customize your own using the twelve different chart types. You'll find you can develop quite interesting comparisons at the building, loop and component level quickly and create result screens like the ones displayed below. In addition, you can also bring in external EnergyPlus files into Simergy and use the Results Visualization capabilities. Let your creativity for analyzing results run free...

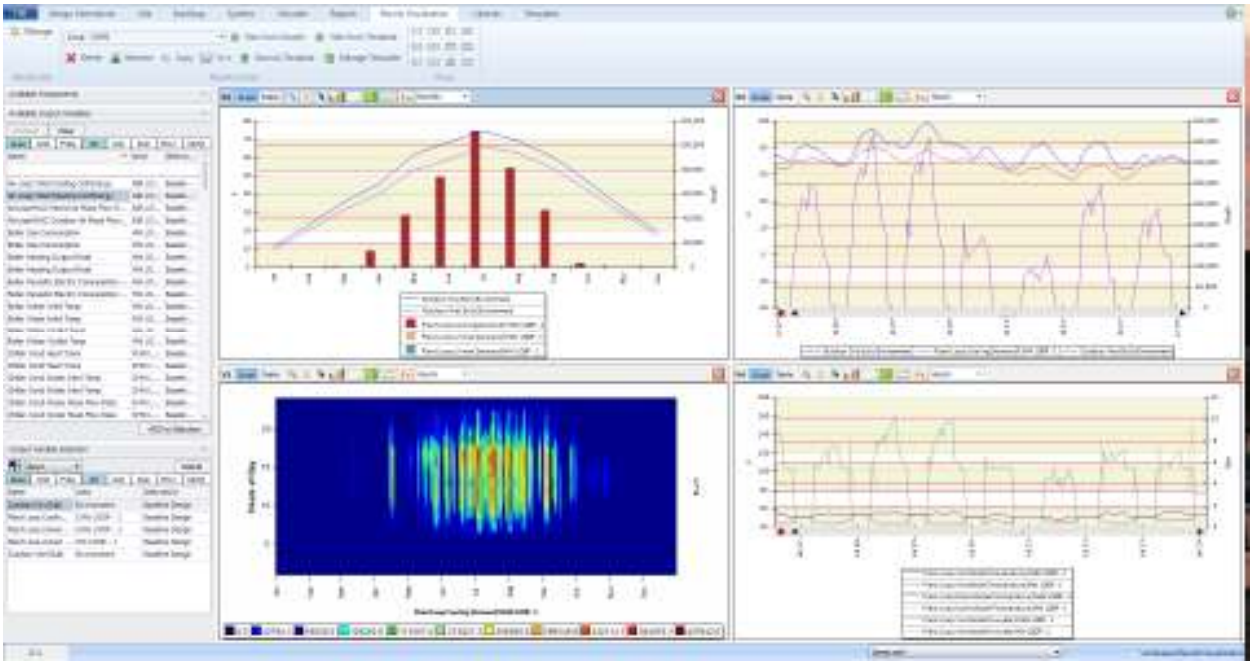


Figure - example of a Results Screen Template that was applied to a completed full year simulation

This Results Visualization Guide includes:

Results Visualization Workspace

The Results Visualization workspace (ResViz) allows the user to interrogate the output variables that were included in the Output Request Set (OPR) that was selected/defined pre-simulation and visualize and investigate the results in a number of ways. The user can set up views in any of a number of different chart types or they can view the results in tabular format. Sets of 1-4 views can be saved as a Results Screen to be revisited for this project at a later time or the view set can be saved as a Results Screen Template and used across multiple projects. In addition, a set of Results Screen Templates are included with Simergy, so that users can utilize them as a starting point for viewing results.

The Results Visualization Workspace is comprised of four fields, in addition to the Ribbon which is described below:

Available Components (Results Visualization Component Tree)

By default this field is compressed to provide more area for the Available Output Variables and Output Variable Selection Fields. The Component Tree allows the user to view what components are associated with the Zone HVAC Groups and the HVAC Systems including the Air and Water Loops. Depending on what Output Variables are included in the Output Request Set, the component tree can be used to filter the Output Variable set by double clicking on a component. If there are Output Variables associated with that component in the Output Request Set, then they will be displayed in the Available Output Variables table. Otherwise this table will appear empty.

Available Output Variables

Displays the Output Variables that are available to the user to incorporate into Results Views. The list is determined by the Output Variables that are defined in the Output Request Set library that is established pre-simulation. The table contains a number of ways that the Output Variables Set can be filtered, so that they can be managed by the user more effectively to obtain the desired Output Variable selection. Once identified and selected the user can then select ADD to Selection, which will add that Output Variable to the Output Variable Selection table and incorporate it into the active Results View.
Tip: Simulation time and the size of the Results file are directly affected by the number of Output Variables that are included in the OPR. This is the main reason that users do not select all of the >10,000 output variables and meters that available in EnergyPlus. It is important for the user to put some thought to what output variables they will want to investigate and interrogate in Results Visualization, so that they can include them in the Output Request Set (ORS) library. Because if the user is looking to view the results for an output variable that is not part of the ORS, then they will need to go back and add that Output Variable and rerun the simulation.

Output Variable Selection

The table where the Output Variables associated with the current Results View are displayed. If there is more than one Results View the user can change the active Results View by either selecting from the drop down list above the table or selecting the view directly. Changing the active view will change the Output Variables shown in the table. The columns in the table can be varied by selecting the column headers shown below the view drop down list. The user can toggle on/off the columns displayed in the table below by either selecting (colored) or deselecting the column header. In addition, the user can

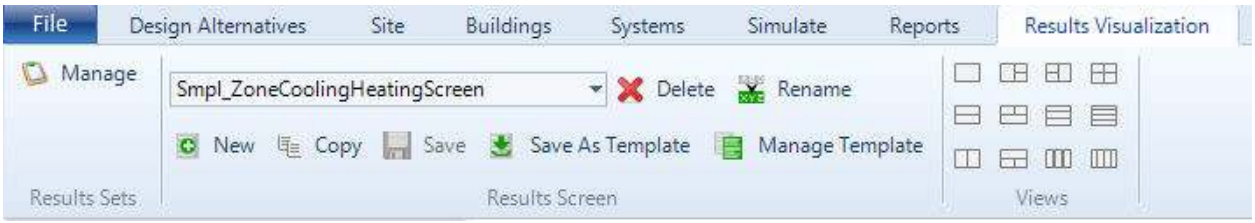
delete Output Variables from the table and ultimately the current view by selecting the output variable and then selecting delete.

Results Views (1-4 views)

The Results View field can be configured in a number of different combinations of 1 to 4 views based on the view configuration icon that has been selected from the ribbon. For each view the user has the ability to view it as either a chart or a graph. The format and appearance properties can be accessed by having the mouse located within the view and right clicking and selecting properties. The user has a number of edge controls on each view that allow them to zoom, pan, data track, change the chart type (9 options) and change the frequency displayed (5 options).

Tip: Any information displayed in a Results View can be captured and/or exported by moving the mouse into the view and right clicking to access the Export, Copy and Print capabilities

Ribbon



The Ribbon includes three sections (although the areas of the workspace do not change)

Results Sets

Manage Results Sets

A pop-up dialog box that allows the user to select which simulation runs (Simulation Configurations) they want to view the output variables for. Once a Results Set is selected the Output Variables associated with it are added to the Available Output Variables table, which is the source for Output Variables that can be selected, which adds them to the Output Variable Selection and to the current view. The Manage Result Sets dialog box remains open until you close it. Therefore, you can select and deselect Results Sets at any time while working within Results Visualization.

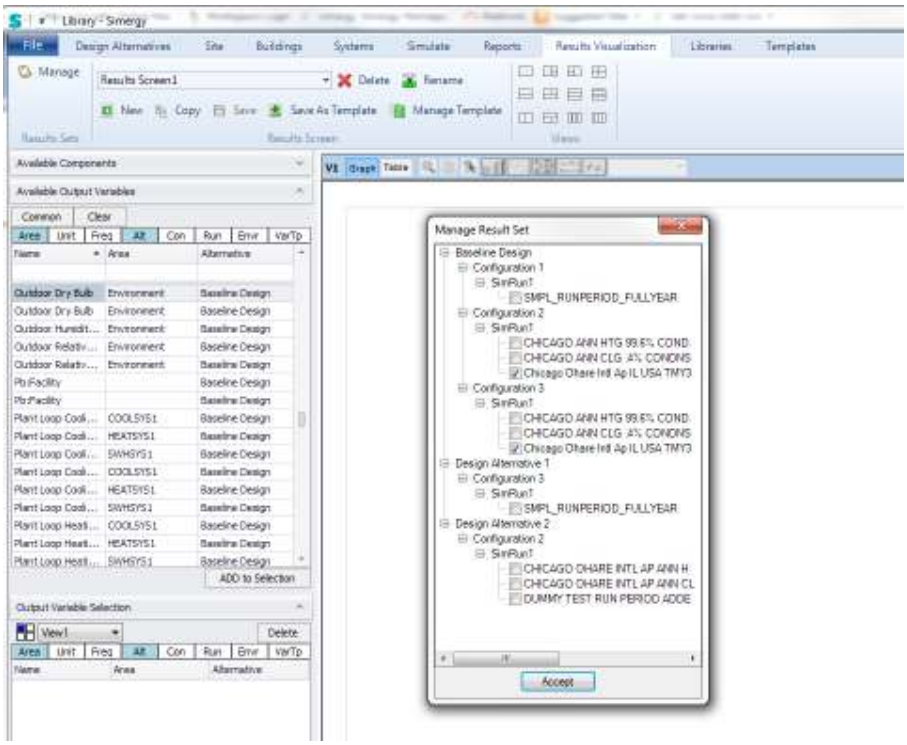


Figure - Shows the Manage Results Set pop-up dialog that appears when Manage is selected. By selecting the checkbox next to each of the available options that Result Set will be active and the Output Variables available within Results Visualization.

How can you tell if a Results Set is Active?

You can confirm which Results Sets are active by selecting the Configuration (Con) and SimRun (Run) to be displayed in the Available Output Variables Table

What happens when a Results Set is Deselected?

When you deselect a Results Set the following will occur:

- The Output Variables associated with the Results Set will be removed from the Output Variable Selection Table
- If Output Variables from that Results Set are included in the Selected Output Variable Table they will be removed.
- If Output Variables from that Results Set are included in the active Results View they will be removed.

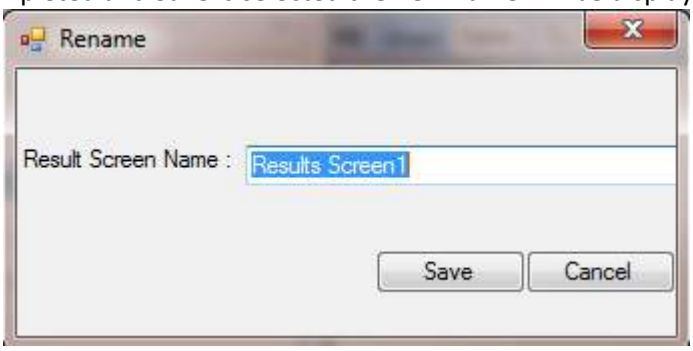
Results Screen Templates

Results Screen Drop Down List

The available Results Screen Template selections active for this model. If the user is visiting the ResViz workspace for the first time for a model the default in this field will be Results Screen 1, and other options will not be available from the drop down list. By selecting different Results Screens the information shown in the different fields and views within the workspace will change.

Rename

A pop-up dialog box that allows the user to change the name of the current Results Screen. After edits are completed and Save is selected the new name will be displayed in the Results Screen Options field.



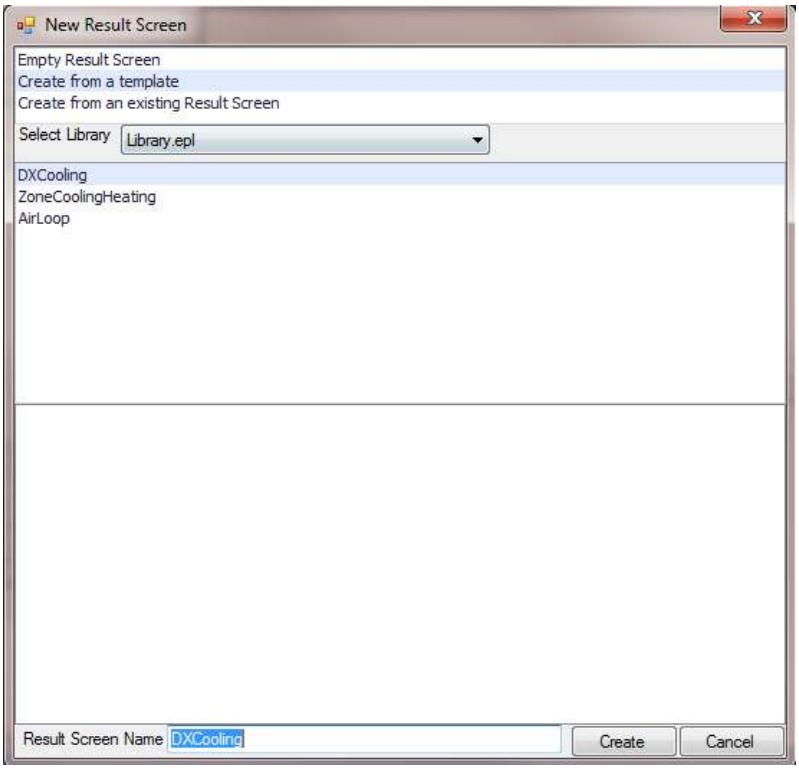
Delete

Allows the user to delete the current Results Screen from the model.

Note: If a Result Screen Template has been used as a starting point for a Results Screen and then saved as a Results Screen, if it is deleted only the Results Screen is deleted from the model, the Results Screen Template is not deleted.

New

A pop-up dialog that provides the user three options as a starting point for creating the Result Screen, which include starting with an Empty Result Screen, Create from a Result Screen Template or Create from an existing Result Screen. Selecting either the second or third option (shown below) provides a list of the available options for selection. In addition, the user can define the name for the new Result Screen.



Copy

Makes a copy of the current Results Screen. The copy becomes the current Results Screen and the new name shown in the Results Screen Options field is the previous Results Screen name prefaced by "Copy of". The name can be changed by selecting Rename. If the user selects the arrow to expose the drop down list for the Results Screen Options field they will see the previous Results Screen is part of the list.

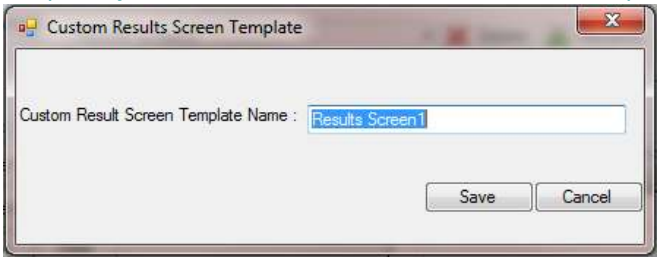
Save

Saves changes made to the current Results Screen.

Save as Template

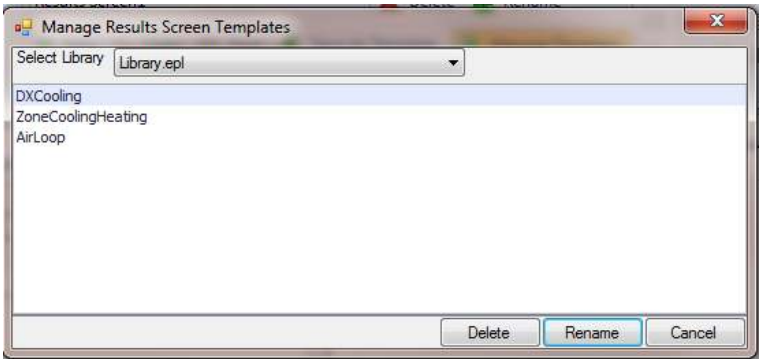
A pop-up dialog that allows the user to save the current Results Screen as a Results Screen Template enabling it to be saved to the Library and used across multiple projects.

Note: For a Results Screen Template to be 'Fully Active' within another project the Output Variables that are part of the saved views will need to be in the Output Request Set for the other models.



Manage Template

Provides the user the ability to change Libraries without going to File/Options, so that they can access Results Screen Templates that they may want to use that are associated with different Libraries. The Select Library drop down list will present the user the four options for Libraries that have been selected in the File/Options Dialog and the option to select Project Model. When a Library has been selected the Results Screen Templates that are available are displayed. The user can Rename or Delete the Results Screen Template within this dialog, but they cannot select it to include in the project. To do that the user selects New and they select Create from Result Screen Template in the dialog the list of Results Screen Templates that was shown in the Manage Template dialog will be displayed and can be selected.



Views

View Configuration Icons - The twelve view configuration options provide the user the ability to shape the Results View Field in a number of different ways utilizing one to four views.

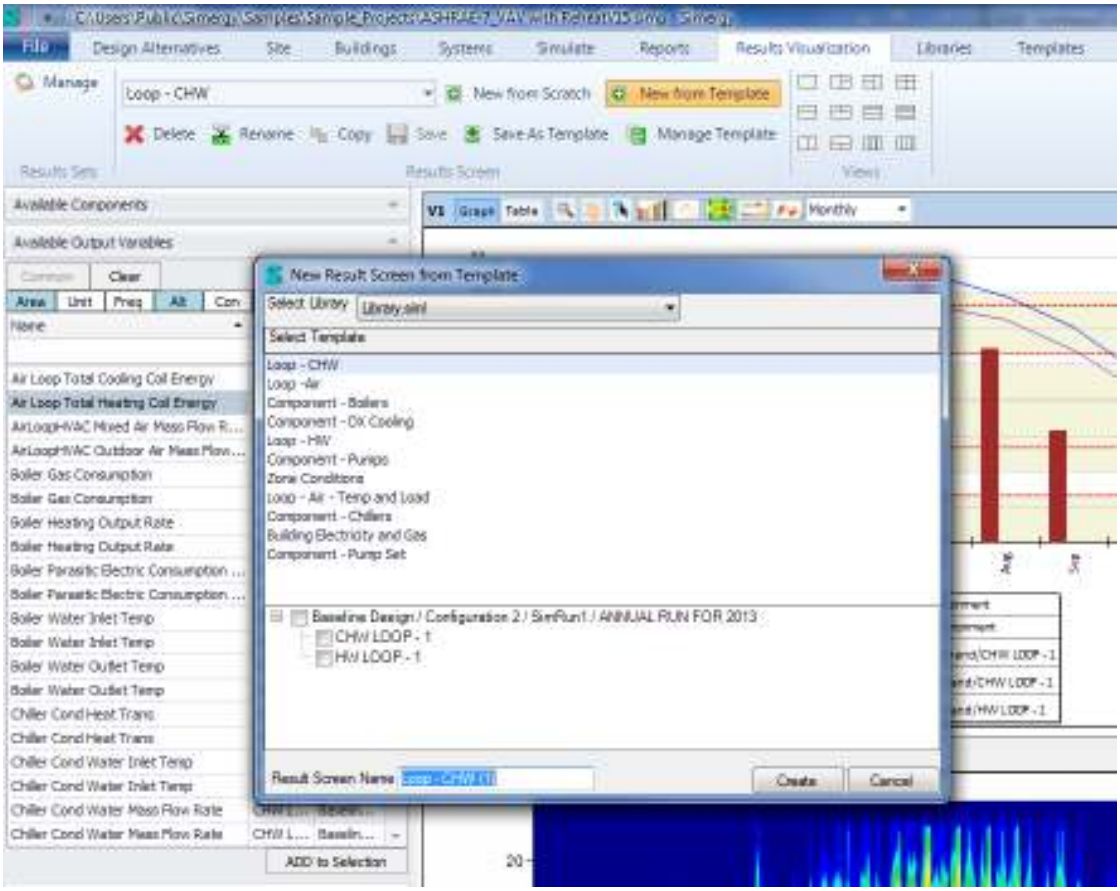
Results Screen Templates

Workspace: **Results Visualization**

Using Results Screen Templates

The process for utilizing the available Result Screen Templates is fairly simple (see image below):

1. Select "New from Template" from the Result Screen ribbon section and a pop-up dialog box will appear (see image below)
2. Select the Desired Result Screen Template from the list in the dialog box (see available Result Screen Templates)
3. If there are selection options displayed in the lower portion of the dialog box, such as available Results Sets, zone listing per Results Set, loop type or other, make the desired selections. The selections displayed are dependent upon what output variables the Results Screen Template are displaying.
4. Select Create
5. The Result Screen Template is created and the output variables that are included in the Results Set that match those that are a part of the Result Screen Template will be displayed in the Results Views that have been predefined. The Result Screen Template (shown above) is the "Loop-CHW" (shown below), which has both the CHW Loop - 1 and HW Loop -1 boxes selected.



Note: The image shows the list of Result Screen Templates that are included with the Simergy version 1 installation

Result Screen Template (RST) Selection Options

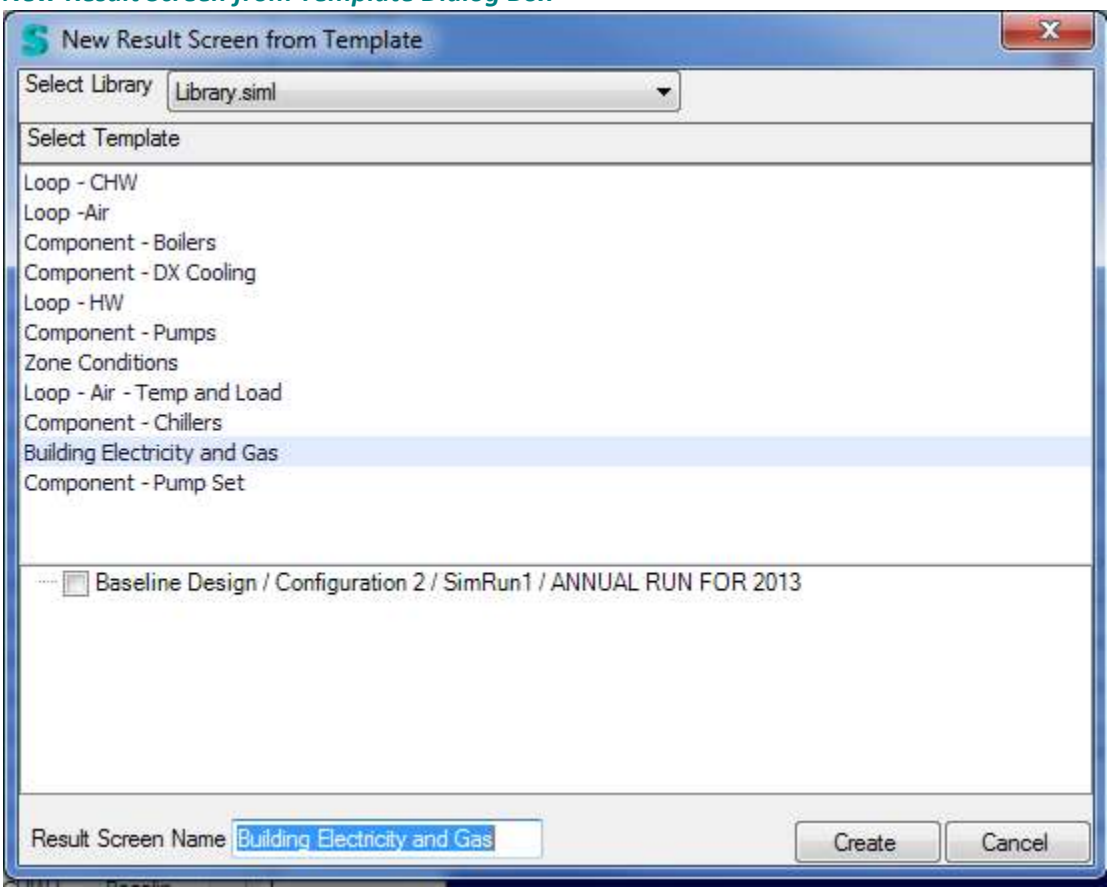
Simergy Version 1 contains the following Result Screen Templates

Result Screen Template Names	Descriptions
Building Electricity and Gas	A set of four (4) Results Views that displays yearly Electricity for the facility on the left side in two formats. The first is a monthly 2d bar chart, and the second is a surface chart. On the right side the two Results Views show the two same types of views, but for the Gas for the facility.
Component-Boilers	A set of two (2) Results Views that on the top view displays the monthly gas consumption for the selected boilers side by side in a monthly bar chart with the Outdoor Dry Bulb temperature graphed as well to so the potential relationship. The bottom Results View also has the Outdoor Dry Bulb Temperature graphed, but the other variables on the line chart are Boiler Water Inlet and Outlet Temperature.
Component-Chillers	A set of four (4) Results Views that allows the comparison of four different sets of output variables for the selected chillers. The output variables include Plant Loop Cooling Demand, Chiller Evap Water Inlet and Outlet Temperatures, Chiller Evap Heat Transfer, and Chiller Evap Water and Cond Water Mass Flow Rate.
Component-DX Cooling	*example coming soon...*
Component-Pump Set	A set of four (4) Results Views that enables a comparison between Pump Bank Electric Power and Pump Bank Mass Flow Rate in sets of views side by side. The top Results view is an hourly view for a period in May, allowing a closer look at a strategic time of the year, while the lower Results Views allow the overall year view.
Component-Pumps	*example coming soon...*
Loop Air Temperature and Load	*example coming soon...*
Loop-CHW	A set of four (4) Results Views that has three Results Views looking at the Plant Loop Cooling Demand graphed in three different ways to enable different performance vantage points and a Results View comparing Plant Loop Inlet and Outlet Node Temperature to each other as well as the flow rate for a portion of July.
Loop-HW	A set of four (4) Results Views that has three Results Views looking at the Plant Loop Heating Demand graphed in three different ways to enable different performance vantage points and a Results View comparing Plant Loop Inlet and Outlet Node Temperature to each other as well as the flow rate for a portion of January.
Loop-Air	A set of three (3) Results Views that provides three different

	performance perspectives for the Air Loops selected. The first is a comparison of the total heating and cooling coil energy for the Air Loop. The second is a comparison of the Mixed Air and Outdoor Air Mass Flow Rate, and the third is a surface chart of the total cooling coil energy to enable identification of key periods of consumption over the course of the year.
Zone Conditions	A set of three (3) Results Views that include the same set of variables for each (Sensible Cooling and Heating Energy for the zone and the outdoor dry bulb temperature), but vary the period of time enabling an overall view (year) and two closer looks (January and July).

Building Electricity and Gas Result Screen Template

New Result Screen from Template Dialog Box



The available selections are the available Results Sets.

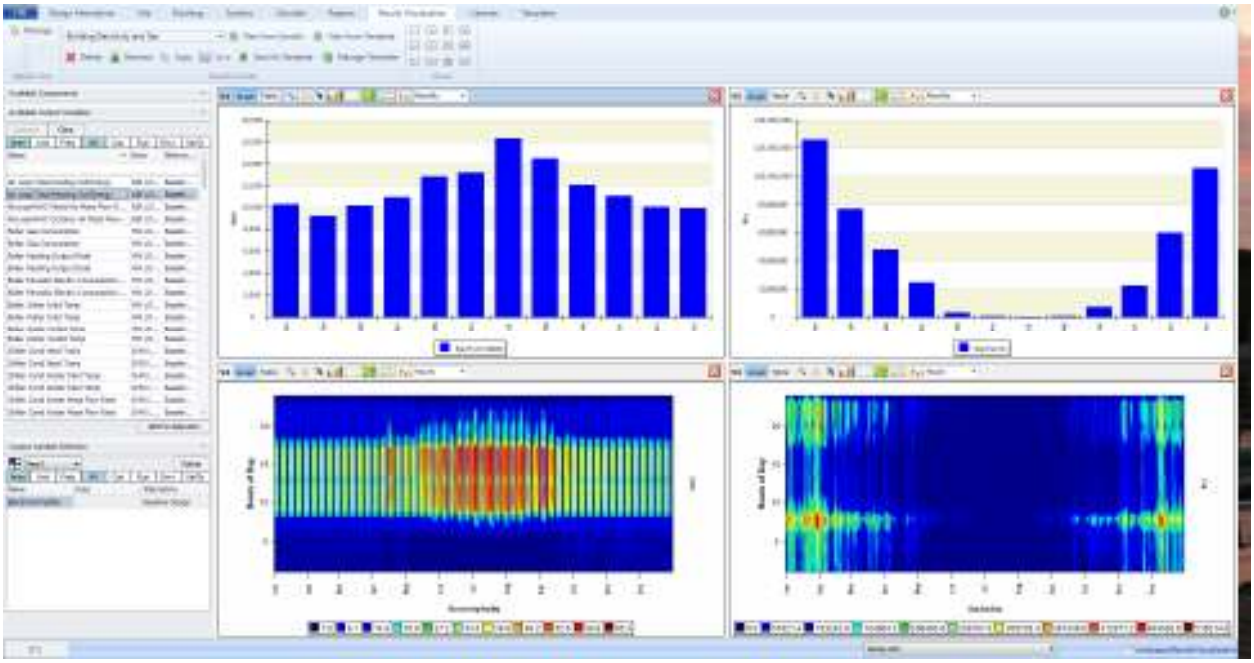


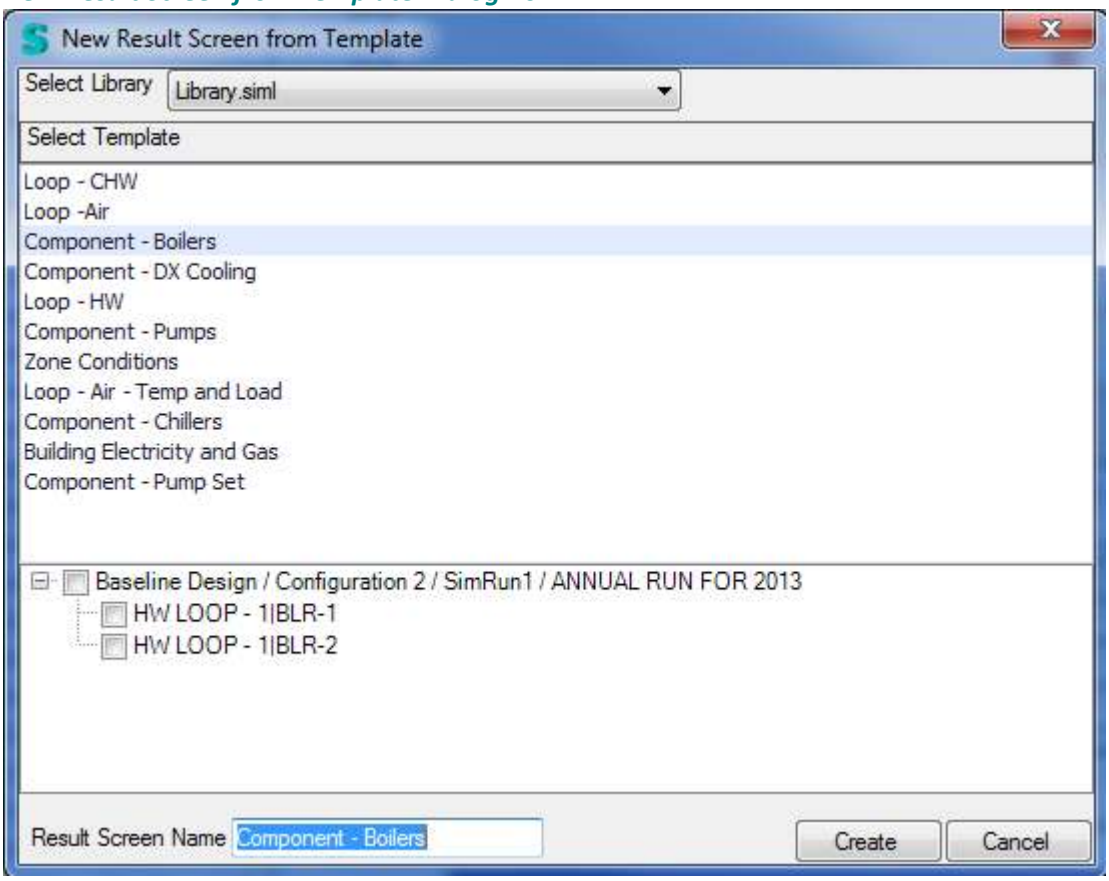
Image - Building Electricity and Gas for the sample file (ASHRAE-7_VAV with Reheat), Simulation Configuration 2.

Output Variables Included in Results Views within Results Screen Template

Results View	Chart or Graph Type	Output Variables	Area	Frequency
1	2D Bar Chart	Electricity:Facility		Monthly
2	Surface Chart	Electricity:Facility		Hourly
3	2D Bar Chart	Gas:Facility		Monthly
4	Surface Chart	Gas:Facility		Hourly

Components-Boilers Result Screen Template

New Result Screen from Template Dialog Box



You can select any boiler or combinations of boilers within a single Result Set or multiple Results sets to create the RST.

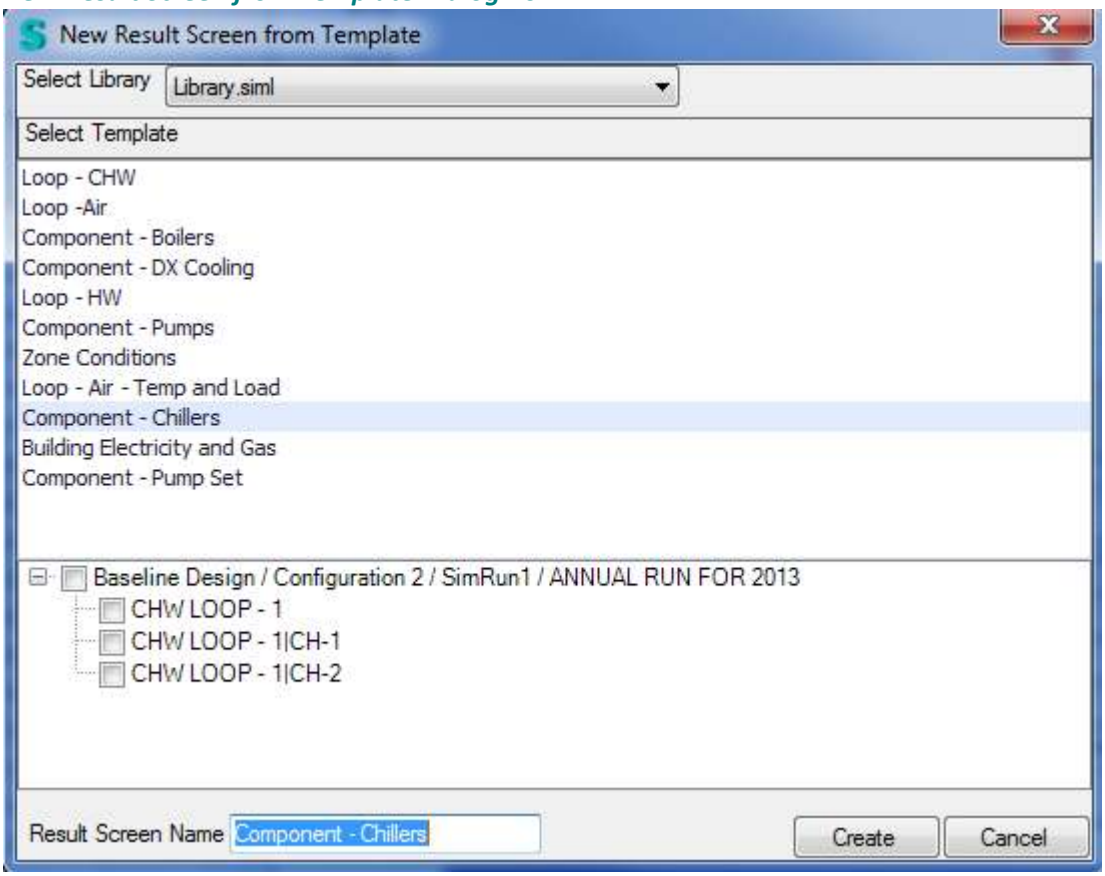
Image - Component Boilers Result Screen Template for the sample file (ASHRAE-7_VAV with Reheat), Simulation Configuration 2.

Output Variables Included in Results Views within Results Screen Template

Results View	Chart or Graph Type	Output Variables	Area	Frequency
1	2D Bar Chart	Boiler Gas Consumption Outdoor Dry Bulb	HW LOOP - 1|Blr Environment	Monthly
2	Smooth Line Chart	Boiler Water Inlet Temp Boiler Water Outlet Temp Outdoor Dry Bulb	HW LOOP - 1|Blr HW LOOP - 1|Blr Environment	Hourly

Components - Chillers Result Screen Template

New Result Screen from Template Dialog Box



You can select the chilled water loops or any or all of the chillers within a single result set or across multiple Results sets.

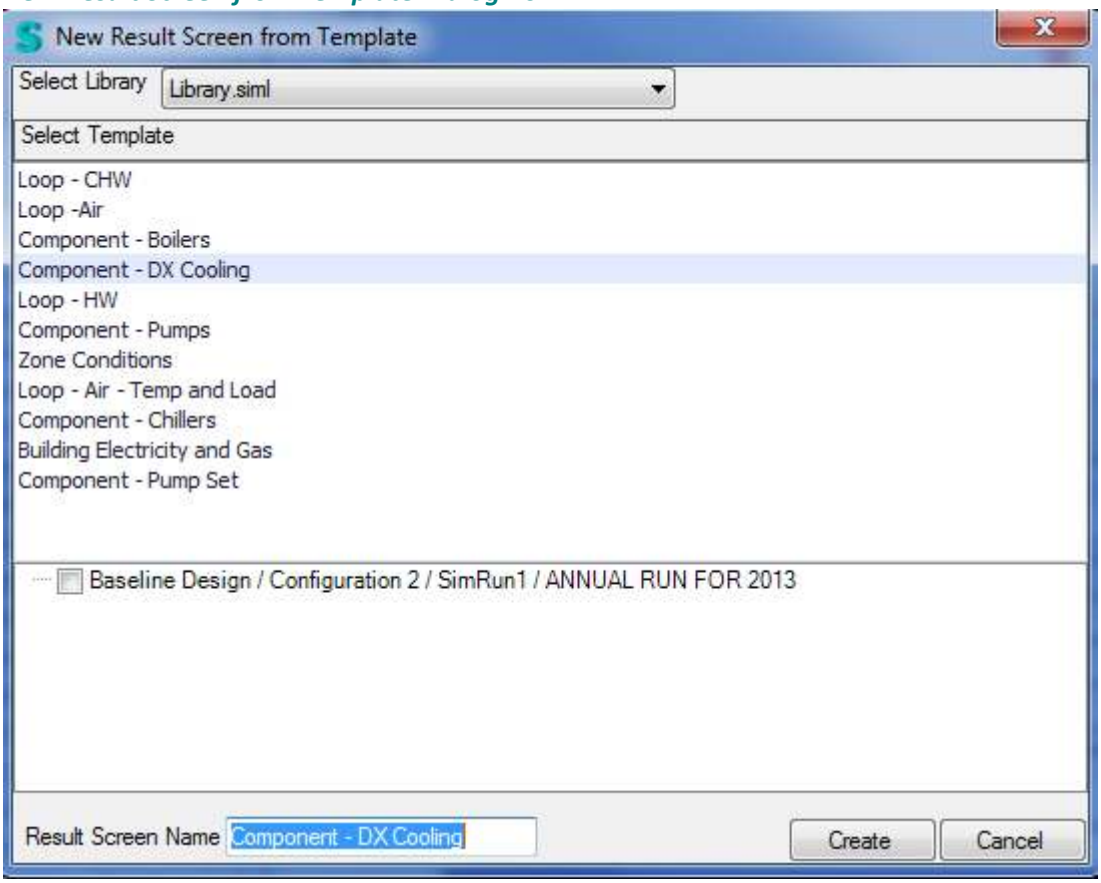
Image - Component Chillers Result Screen Template for the sample file (ASHRAE-7_VAV with Reheat), Simulation Configuration 2.

Output Variables Included in Results Views within Results Screen Template

Results View	Chart or Graph Type	Output Variables	Area	Frequency
1	2D Bar Chart	Outdoor Dry Bulb Plant Loop Cooling Demand	Environment CHW LOOP-1	Monthly
2	Smooth Line Chart	Chiller Evap Water Inlet Temp Chiller Evap Water Outlet Temp	CHW LOOP-1|CH-1 CHW LOOP-1|CH-1	Hourly
3	2D Area Chart	Chiller Evap Heat Trans Chiller Evap Heat Trans	CHW LOOP-1|CH-1 CHW LOOP-1|CH-1	Monthly
4	Smooth Line Chart	Chiller Evap Water Mass Flow Rate Chiller Cond Water Mass Flow Rate	CHW LOOP-1|CH-1 CHW LOOP-1|CH-1	Hourly

Component-DX Cooling Result Screen Template

New Result Screen from Template Dialog Box



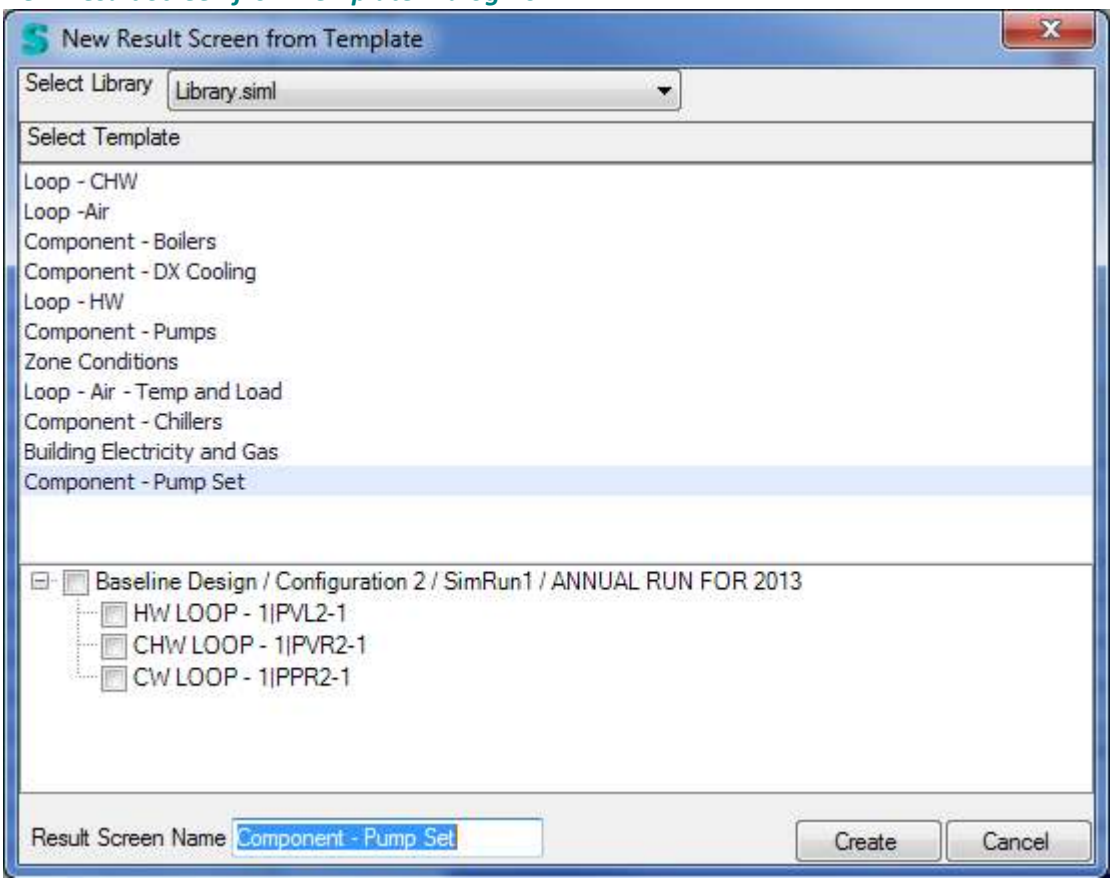
example coming soon...

Output Variables Included in Results Views within Results Screen Template

Results View	Chart or Graph Type	Output Variables	Area	Frequency

Component-Pump Set Result Screen Template

New Result Screen from Template Dialog Box



You can select any or all of the Water Loops associated with a Results Set or multiple Results Sets.

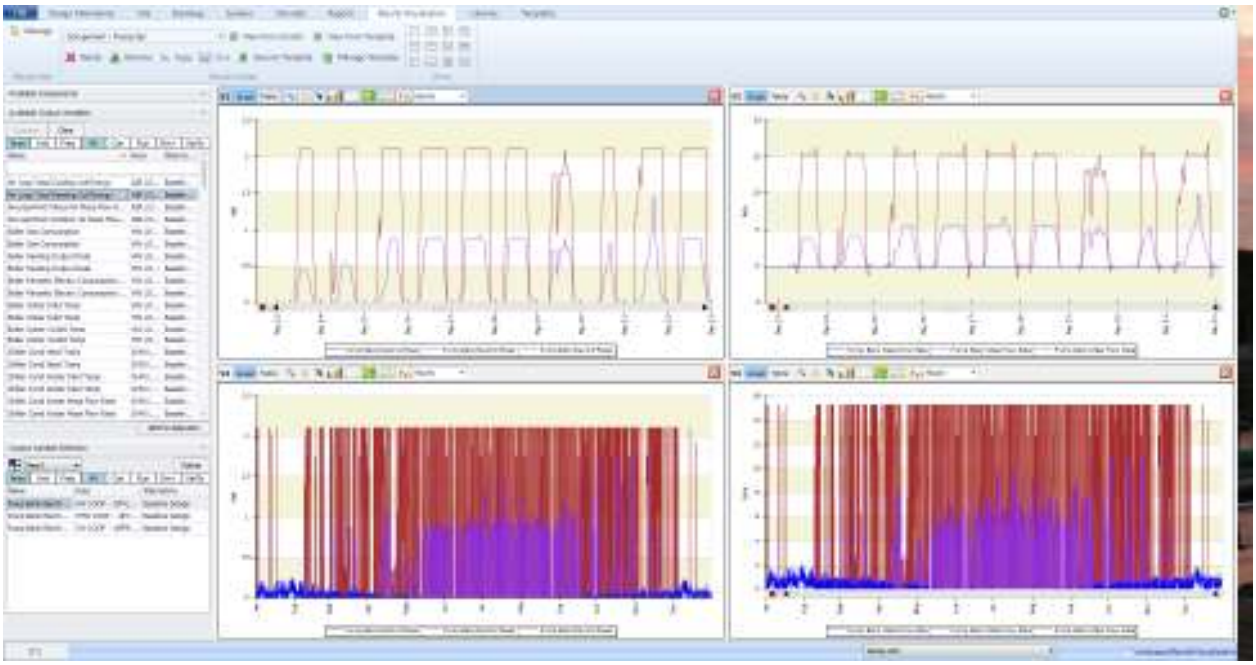


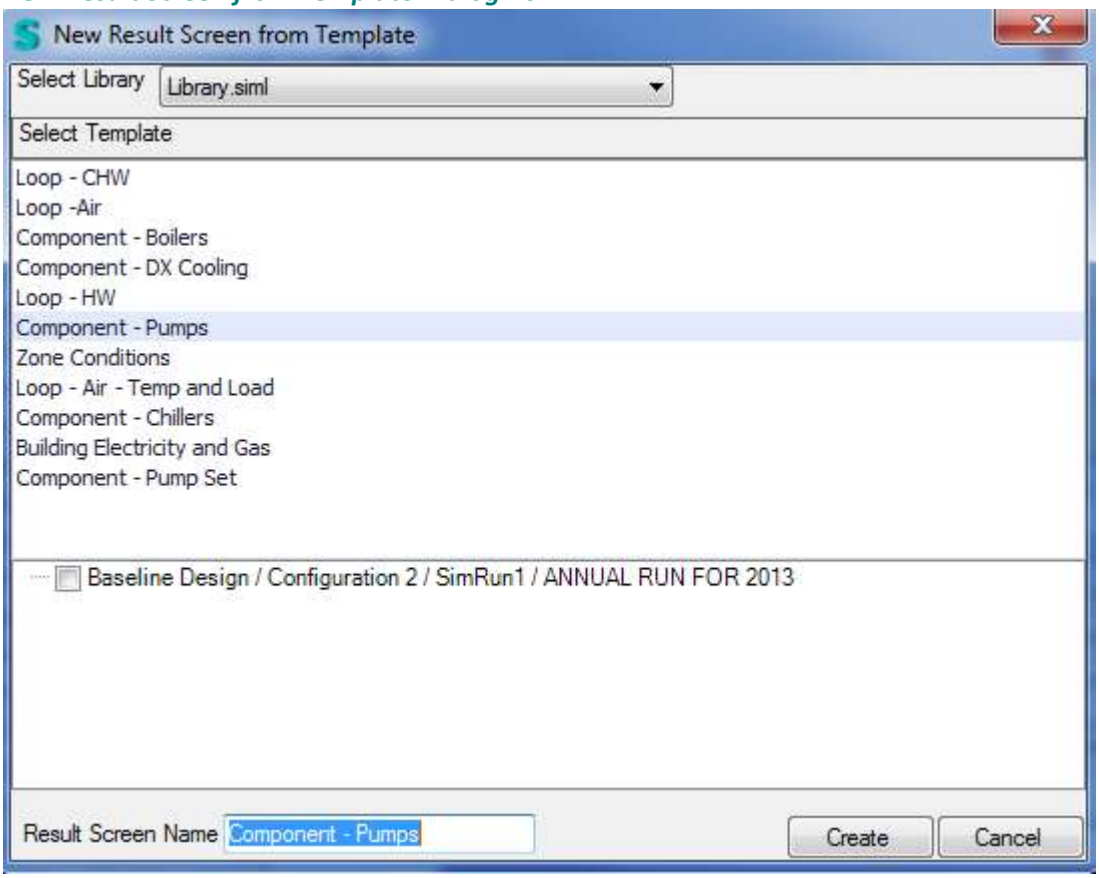
Image - Components Pump Set Result Screen Template for the sample file (ASHRAE-7_VAV with Reheat), Simulation Configuration 2.

Output Variables Included in Results Views within Results Screen Template

Results View	Chart or Graph Type	Output Variables	Area	Frequency
1	Smooth Line Chart	Pump Bank Electric Power	Water Loop	Hourly
2	Smooth Line Chart	Pump Bank Electric Power	Water Loop	Hourly
3	Smooth Line Chart	Pump Bank Mass Flow Rate	Water Loop	Hourly
4	Smooth Line Chart	Pump Bank Mass Flow Rate	Water Loop	Hourly

Component-Pumps Result Screen Template

New Result Screen from Template Dialog Box



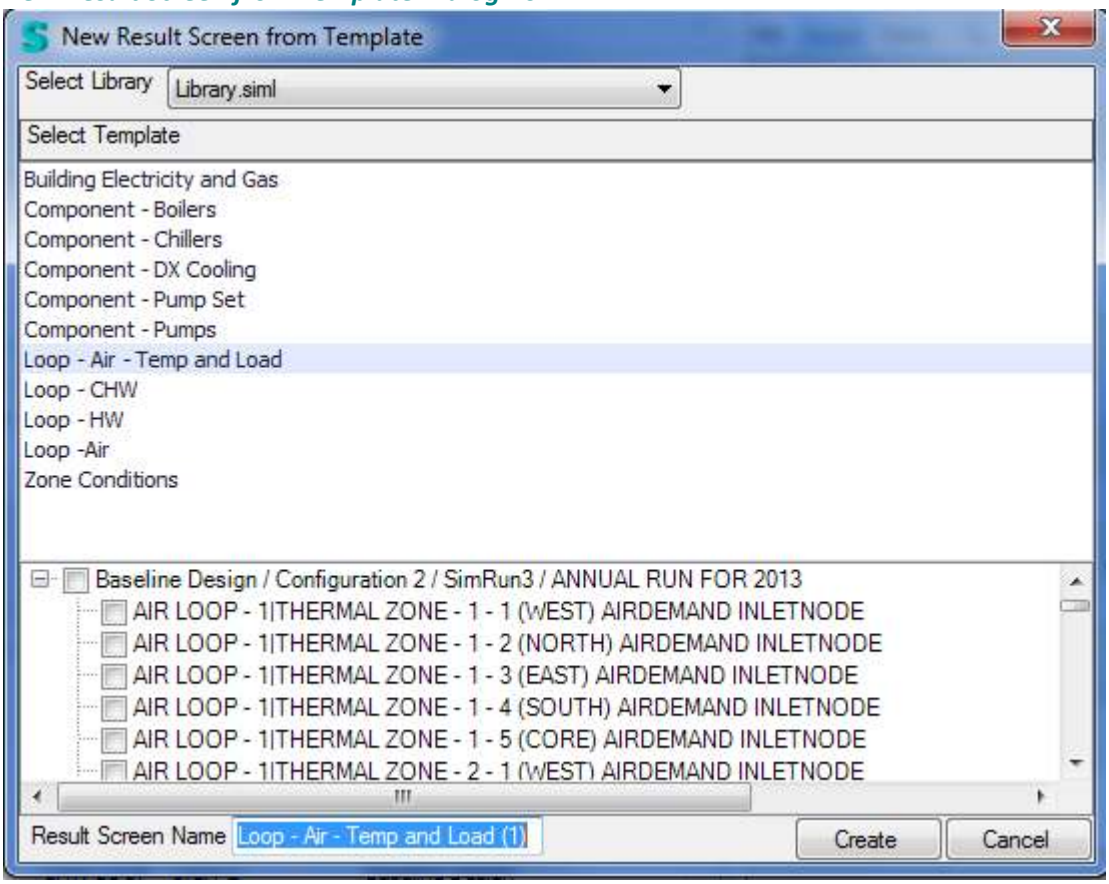
example coming soon...

Output Variables Included in Results Views within Results Screen Template

Results View	Chart or Graph Type	Output Variables	Area	Frequency

Loop Air Temperature and Load Result Screen Template

New Result Screen from Template Dialog Box



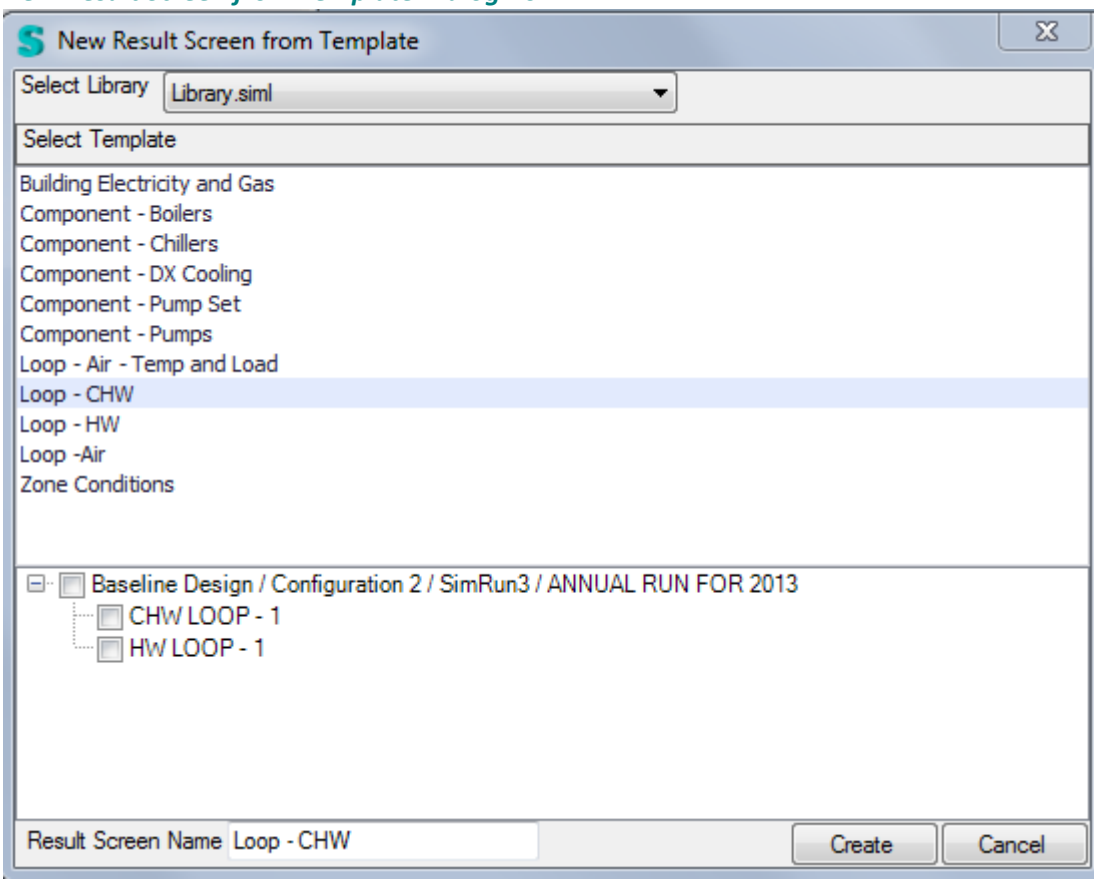
example coming soon...

Output Variables Included in Results Views within Results Screen Template

Results View	Chart or Graph Type	Output Variables	Area	Frequency

Loop-CHW Result Screen Template

New Result Screen from Template Dialog Box



You can select Chilled Water Loops or Hot Water Loops or both for the available Results Sets.

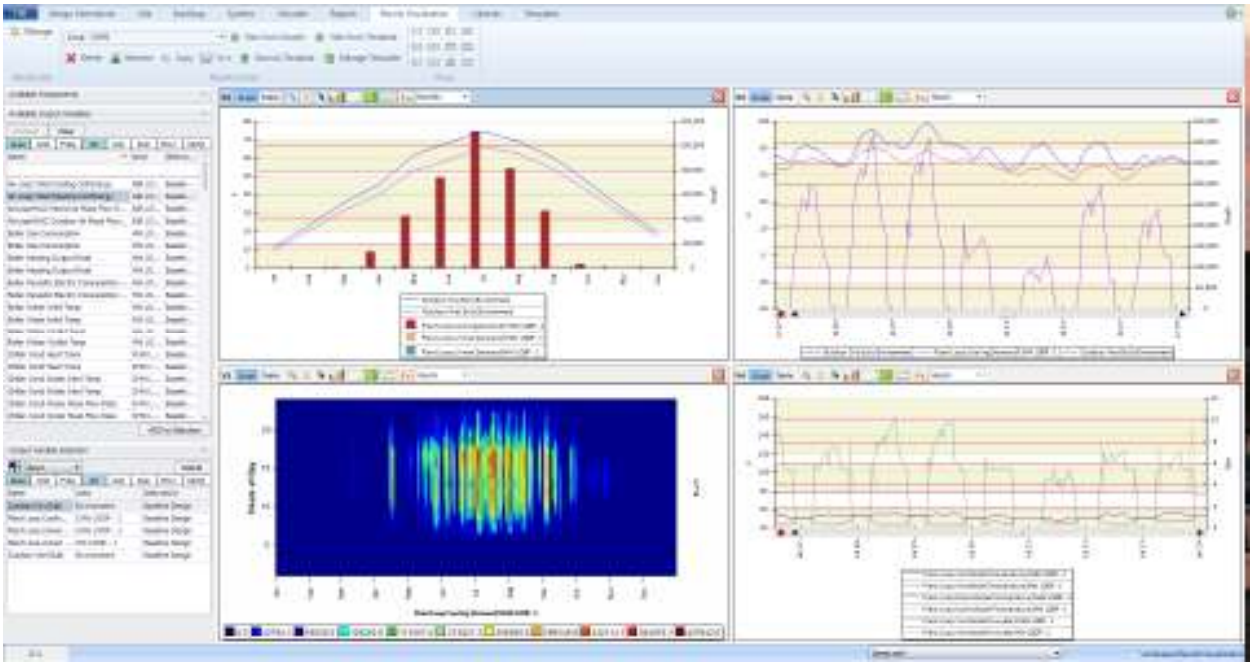


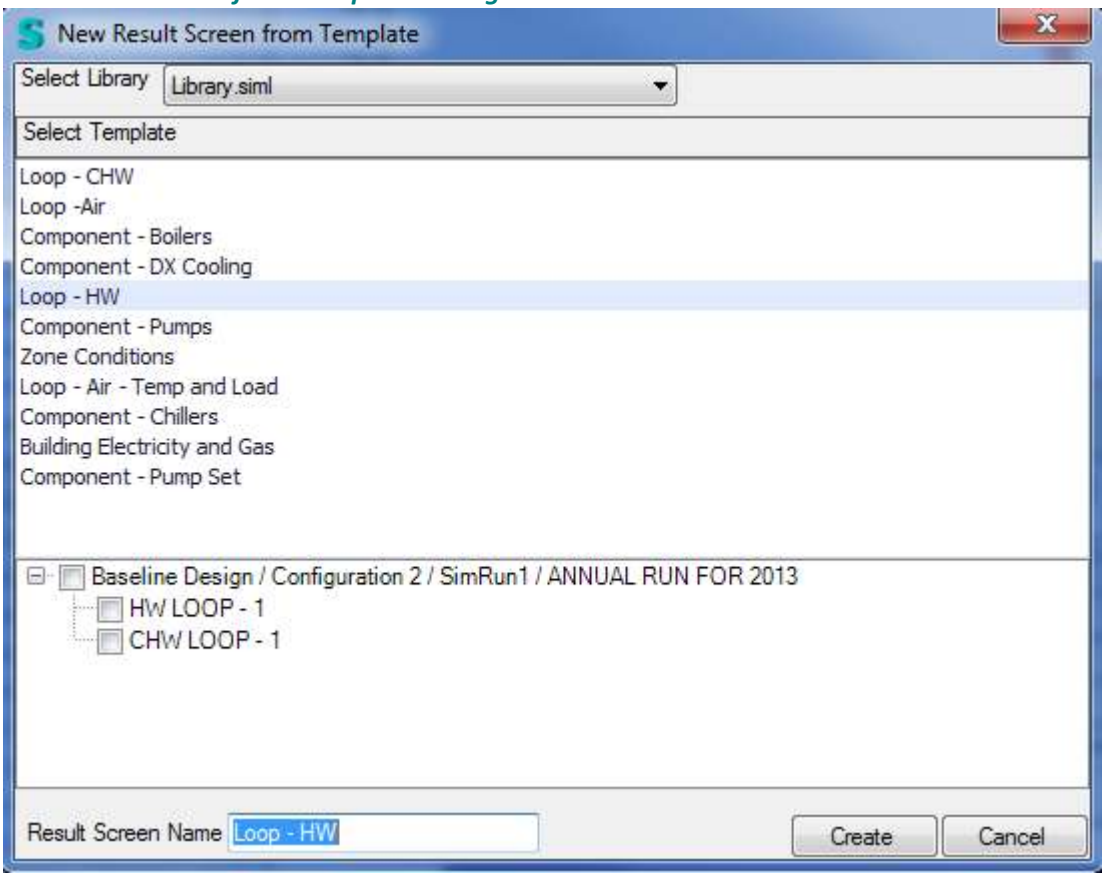
Image - Loop-CHW for the sample file (ASHRAE-7_VAV with Reheat), Simulation Configuration 2.

Output Variables Included in Results Views within Results Screen Template

Results View	Chart or Graph Type	Output Variables	Area	Frequency
1	Column Chart	Outdoor Dry Bulb Plant Loop Cooling Demand Plant Loop Unmet Demand Plant Loop Unmet Demand Outdoor Wet Bulb	Environment CHW Loop - 1 CHW Loop - 1 HW Loop - 1 Environment	Monthly
2	Line Graph	Plant Loop Cooling Demand	CHW Loop - 1	Hourly
3	Contour Plot	Outdoor Dry Bulb Plant Loop Cooling Demand Outdoor Wet Bulb	Environment CHW Loop - 1 Environment	Hourly
4	Line Graph	Plant Loop InletNode Temperature Plant Loop InletNode Temperature Plant Loop OutletNode Temperature Plant Loop OutletNode Temperature Plant Loop InletNode Flowrate Plant Loop InletNode Flowrate	CHW Loop - 1 HW Loop - 1 CHW Loop - 1 HW Loop - 1 CHW Loop - 1 HW Loop - 1	Hourly

Loop-HW Result Screen Template

New Result Screen from Template Dialog Box



You can select any or all of the Hot Water and Chilled Water loops for a single Result Set or Multiple Results Sets

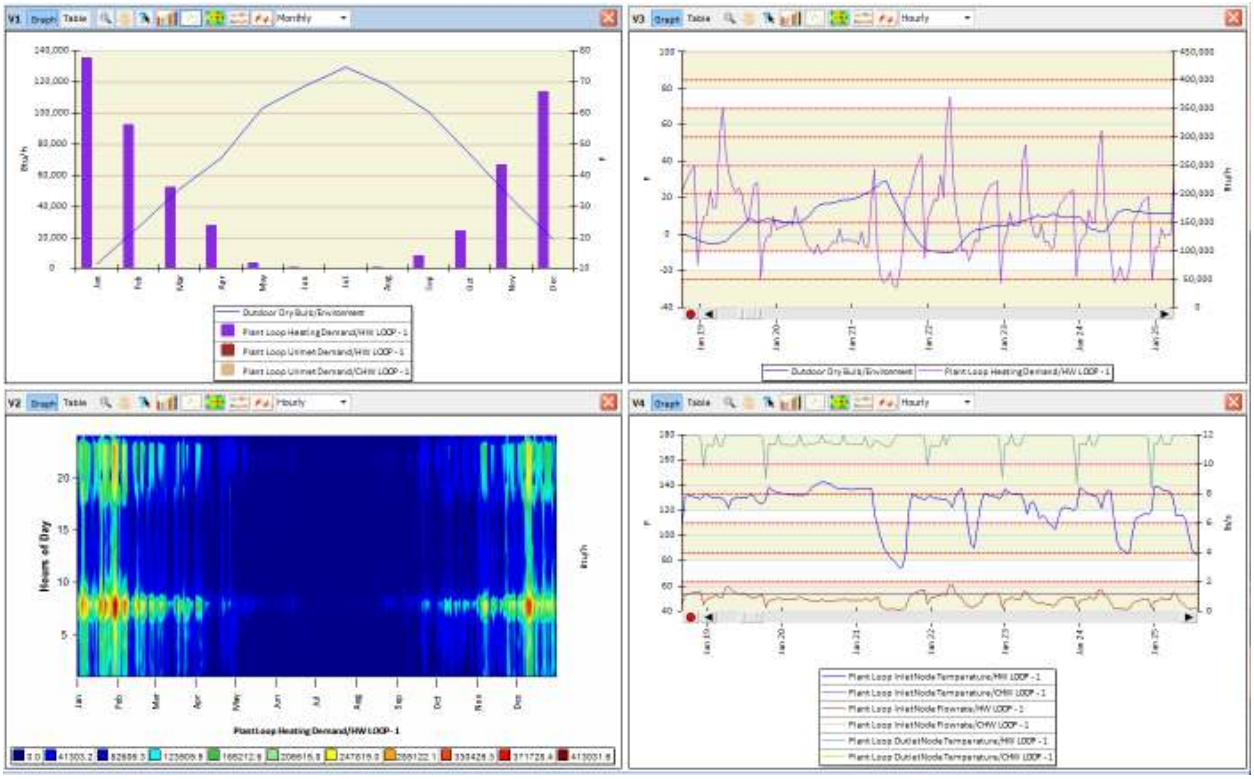


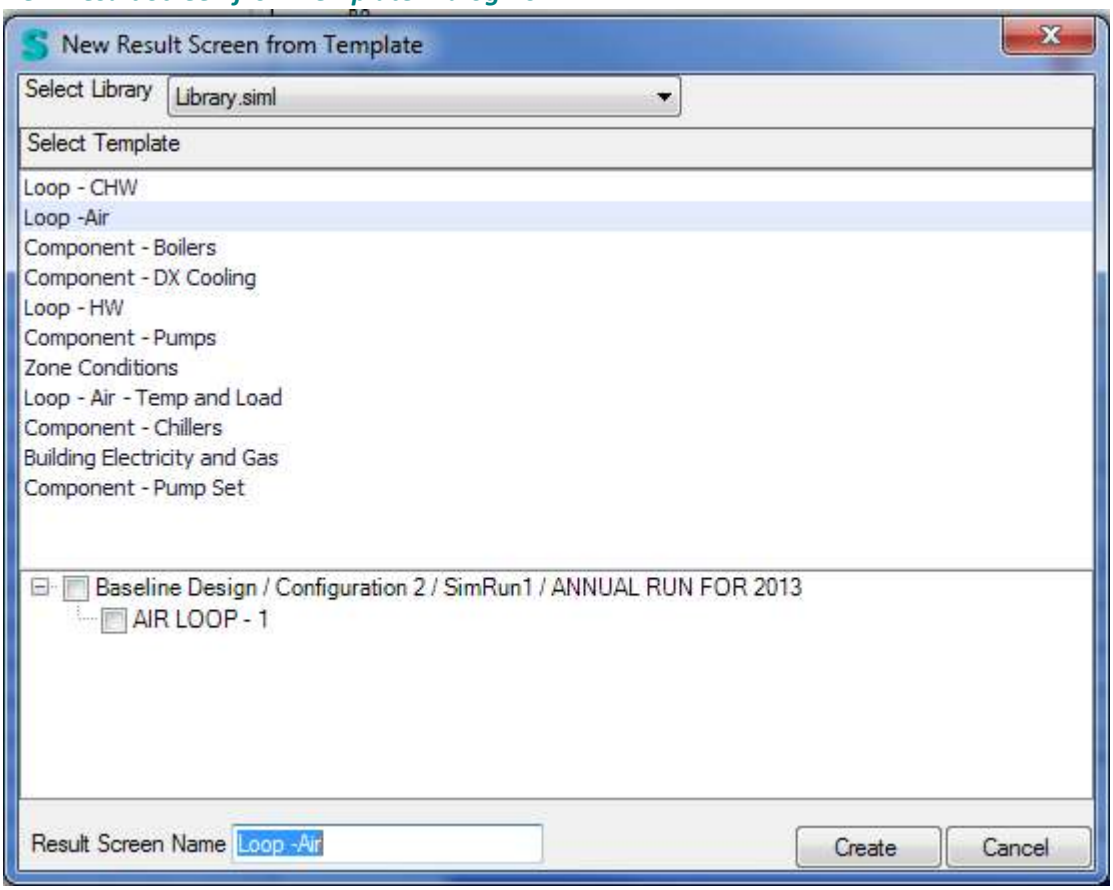
Image - Loop-HW for the sample file (ASHRAE-7_VAV with Reheat), Simulation Configuration 2.

Output Variables Included in Results Views within Results Screen Template

Results View	Chart or Graph Type	Output Variables	Area	Frequency
1	2D Bar Chart	Plant Loop Heating Demand Outdoor Dry Bulb Plant Loop Unmet Demand Plant Loop Unmet Demand	HW LOOP-1 Environment HW LOOP-1 CHW LOOP-1	Monthly
2	Surface Chart	Plant Loop Heating Demand	HW LOOP-1	Hourly
3	Smooth Line Chart	Outdoor Dry Bulb Plant Loop Heating Demand	Environment HW LOOP-1	Hourly
4	Smooth Line Chart	Plant Loop InletNode Temperature Plant Loop InletNode Temperature Plant Loop OutletNode Temperature Plant Loop OutletNode Temperature Plant Loop InletNode Flowrate Plant Loop InletNode Flowrate	CHW Loop - 1 HW Loop - 1 CHW Loop - 1 HW Loop - 1 CHW Loop - 1 HW Loop - 1	Hourly

Loop-Air Result Screen Template

New Result Screen from Template Dialog Box



You can select any of the Air Loops for a single Result Set or multiple Results Sets

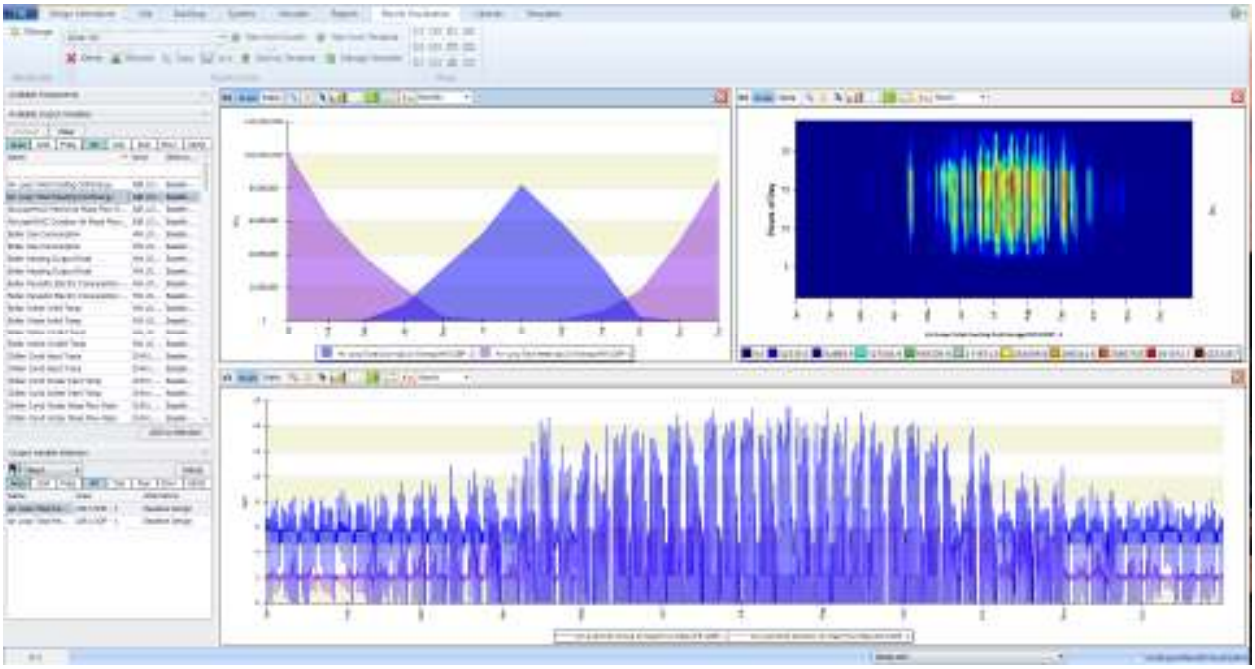


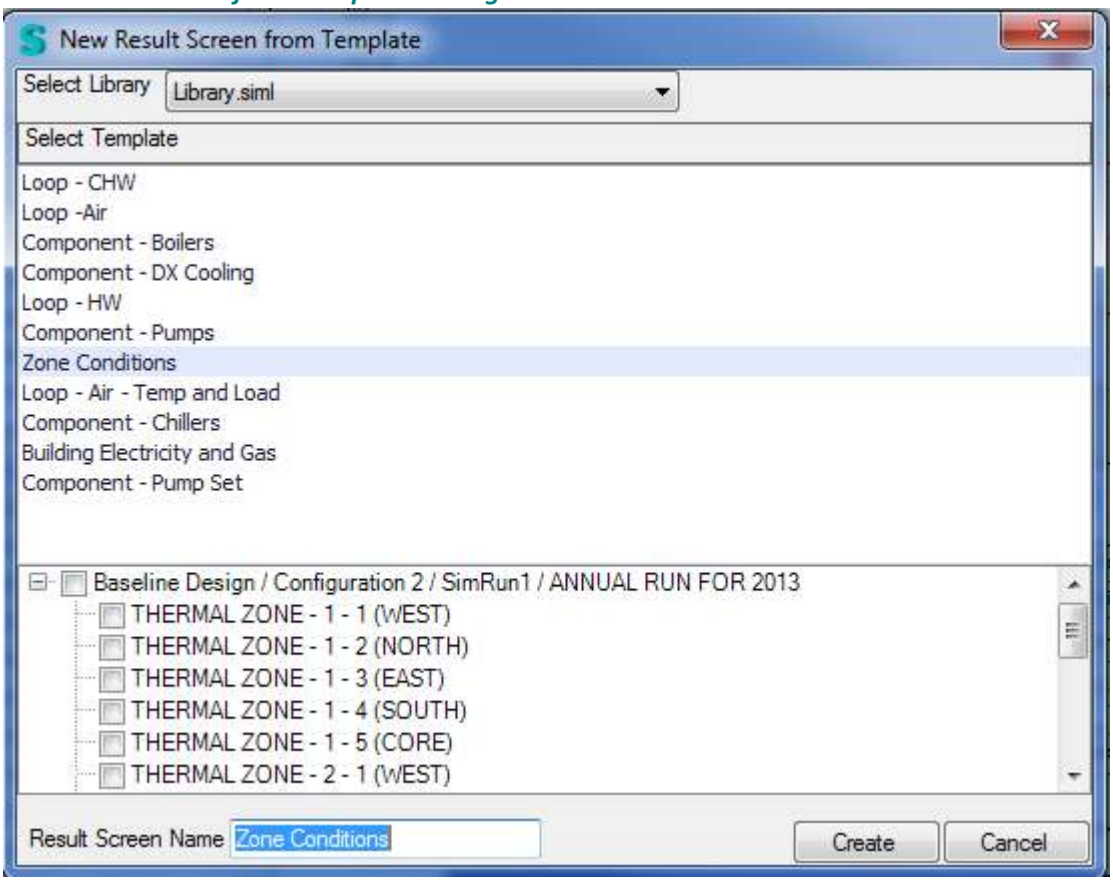
Image - Loop-Air for the sample file (ASHRAE-7_VAV with Reheat), Simulation Configuration 2.

Output Variables Included in Results Views within Results Screen Template

Results View	Chart or Graph Type	Output Variables	Area	Frequency
1	2D Area Chart	Air Loop Total Cooling Energy Air Loop Total Heating Energy	Air LOOP - 1 Air LOOP - 1	Monthly
2	Smooth Line Chart	Air Loop HVAC Mixed Air Mass Flow Rate Air Loop HVAC Outdoor Air Mass Flow Rate	Air LOOP - 1 Air LOOP - 1	Hourly
3	Surface Chart	Air Loop Total Cooling Coil Energy	Air LOOP - 1	Hourly

Zone Conditions Result Screen Template

New Result Screen from Template Dialog Box



You can select any of the thermal zones associated with a single Result Set or multiple Results Sets.

I*mage - Zone Conditions Results Screen Template for the sample file (ASHRAE-7_VAV with Reheat), Simulation Configuration 2.*

Output Variables Included in Results Views within Results Screen Template

Results View	Chart or Graph Type	Output Variables	Area	Frequency
1	2D Bar Chart	Zone/Sys Sensible Cooling Energy Zone/Sys Sensible Heating Energy Outdoor Dry Bulb	Thermal Zone Thermal Zone Environment	Monthly
2	Smooth Line Chart	Zone/Sys Sensible Cooling Energy Zone/Sys Sensible Heating Energy Outdoor Dry Bulb	Thermal Zone Thermal Zone Environment	Hourly
3	Smooth Line Chart	Zone/Sys Sensible Cooling Energy Zone/Sys Sensible Heating Energy Outdoor Dry Bulb	Thermal Zone Thermal Zone Environment	Hourly

Results Sets

Related Workspaces - Simulate; Reports; Results Visualization
Related Examples - Creating Output Requests; Creating Output Request Sets

A Results Set is the SQLite Database (eplusout.sql) of results for a single simulation run. It contains the results for the Output Variables that are available (Output Requests and Output Request Sets) for the user to view in Reports and Results Visualization. By default when a simulation run is launched for a Simulation Configuration it will be give the name of SimRun + a sequential number starting with 1. Therefore a SimRun equals a simulation run, which equals a Results Set.
The Results Sets default location on a user's hard drive after a simulation has been run is C:\Users\Public\Simergy\SimulationResults\<Simergy file name>
The sub categories of the <Simergy file name> are:

- Baseline Design or Design Alternative name
    - Configuration name and number
        - SimRun name and number (contains all of the EnergyPlus output files). *Note: You can change the name to something more descriptive or identifiable.*

Result Sets in a Simergy File

A Simergy file, which can be composed of Baseline Design and Design Alternatives, can contain multiple Results Sets once simulations have been run for each.
Note: One simulation run = One Result Set
A few examples of when a Result Set is created:

- If you create multiple Simulation Configurations for the baseline, each simulation (SimRun) that has been run for that Simulation Configuration will be a separate Results Set.
- If you create multiple Design Alternatives within a Simergy file, the simulation runs associated with each Design Alternative will be a separate Results set.
- If you are interested in creating a Result Set for an IDF file created outside of Simergy see Simulate IDF not from Simergy for the steps involved.

Accessing Results Sets

Once a simulation has been completed and the eplusout.sql file has been created that Result Set will be active in both the Reports and Results Visualization workspaces. In both workspaces multiple Results Sets can be active at the same time to allow you to analyze different simulation runs side by side.

Accessing Results Sets in Reports

If you select "View Results" on the Simulation workspace, you will be taken directly to the Reports Workspace. As mentioned the most recent simulation is the active Results Set, but you can select additional or different Results Sets from the Result Set Selection area of the workspace.

Accessing Results Sets in Results Visualization

As mentioned the most recent simulation is the active Results Set, but if you go to the Results Visualization workspace you can select additional or different Results Sets by selecting Manage from the

ribbon, which displays a dialog box that displays all the available Result Sets within the Simergy file that are available for selection (shown below).

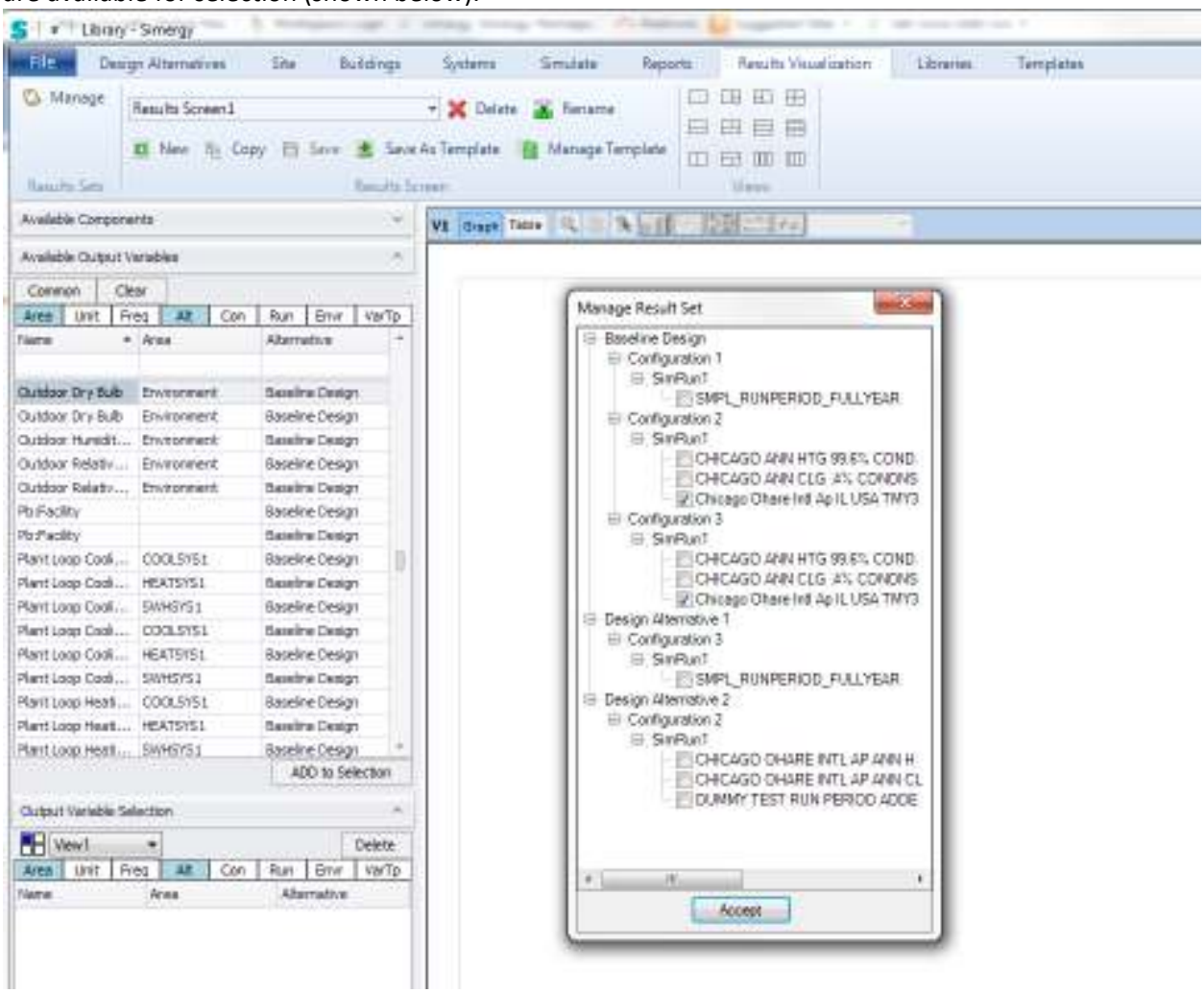


Image: Selecting the Manage button from the ribbon displays a dialog box showing all the Result Sets that are available in the Simergy file. This case shows a number of different Result Sets for the Baseline Design Simulation Configurations as well as for the Simulation Configurations for each of the other two Design Alternatives. Each checkbox is a different Result Set.

Examples - Adding Output Variables for Multiple Results Sets to a Results View

The following scenarios present different approaches to "selecting" and "adding" output variables to a results view with ResViz.

Scenario Assumptions:

- Multiple Results Sets are active, which have been selected using "Manage"
- You are building a Results View by selecting Output Variables from the Available Output Variables Table and adding them to the Output Variable Selection Table, which incorporates them into the Results View.
- You are adding Output Variables to a Results View that was already set up using a Results Screen Template

Using the Common Button

The Common button becomes useful when you are working with multiple Result Sets. It allows you to reduce the list of Output Variables being displayed in the Available Output Variable Selection Table to only those that are the same across the two or more Result Sets that are active.

Available Output Variables

The following are the features associated with the Available Output Variables Table.

Tip: Remember the flow to incorporate Output Variables in Results Views:

- ***Output Request Set*** *- include desired Output Variable in the Output Request Set (pre-simulation)*
- ***Available Output Variables Table*** *- select the desired Output Variable from the table and select ADD to Selection.*
- ***Output Variable Selection*** *- once an Output Variable has been Added to Selection, then it will appear in this table.*
- ***Results View*** *- once an Output Variable has been Added to Selection, then it will appear in the Result View. (Default format = Graph, Line Chart)*

Common

Common is only active when multiple results sets have been selected (see Manage).

By **SELECTING** Common only the "Common Output Variables" that are present in both Results Sets will be displayed in the table.

By **DEselecting** Common the default Output Variable list for the Output Request Set for the individual Results Set or multiple Results Sets will be displayed.

Clear

When Common is NOT ACTIVATED - Takes the user back to the default Output Variable list for the Output Request Set for the individual Results Set or multiple Results Sets by removing any of the "filter features" that have been used on the original Output Variable list.

When Common IS ACTIVATED - Removes any filters that have been previously used on the "Common Output Variable Set" and takes the user back to this list of the Common Output Variables.

Note: Clear does not change which columns are displayed in the table.

Column Header Buttons

The eight column header buttons are always shown and they function as toggles to turn on or off the view of that column within the table. When the Header Button has a "bluish background" it means that column is active. Space is at a premium in the interface and this enables the user to work more effectively with the table to review a range of different information that could be important to determine which output variables are the best to select are.

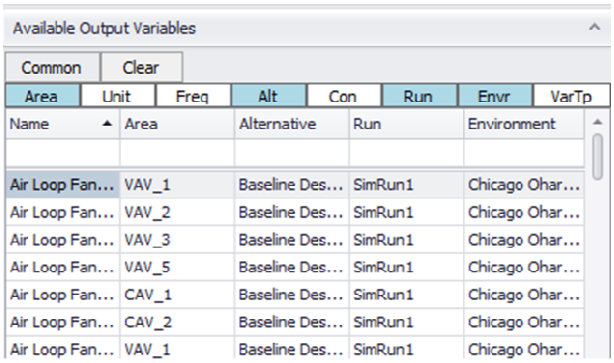
The table identifies the eight column headers and shows the abbreviations that are used within the interface.

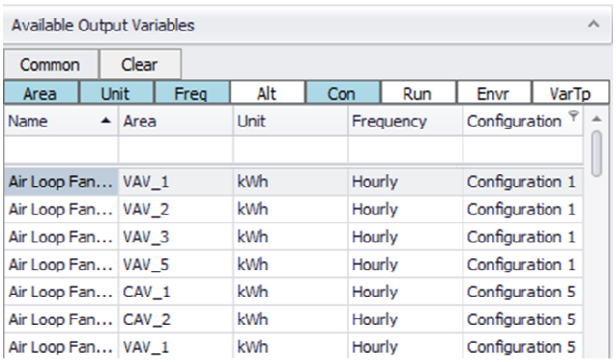
Note: The Name Column is always displayed and it does not have a Header Button.

Abbreviation	Full Name

Area	Area
Unit	Units
Freq	Frequency
Alt	Design Alternative
Con	Simulation Configuration
Run	Simulation Run Name
Envr	Environment
VarTp	Variable Type

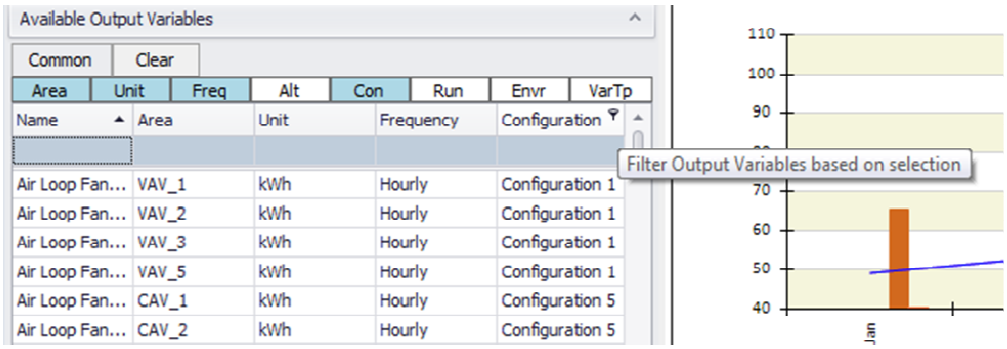
Example: *Two views of the same Available Output Variables table are shown. The table on the left has the Area, Design Alternative, Simulation Configuration and Environment columns turned on, while the table on the right has the Area, Unit, Frequency and Simulation Configuration columns active. By looking a bit closer at the table on the right we see that in the Configuration column there are two Configurations listed (configuration 1 and configuration 5), which indicates that we have multiple results sets active. Had we just been looking at the one on the left, we might not have realized that.*

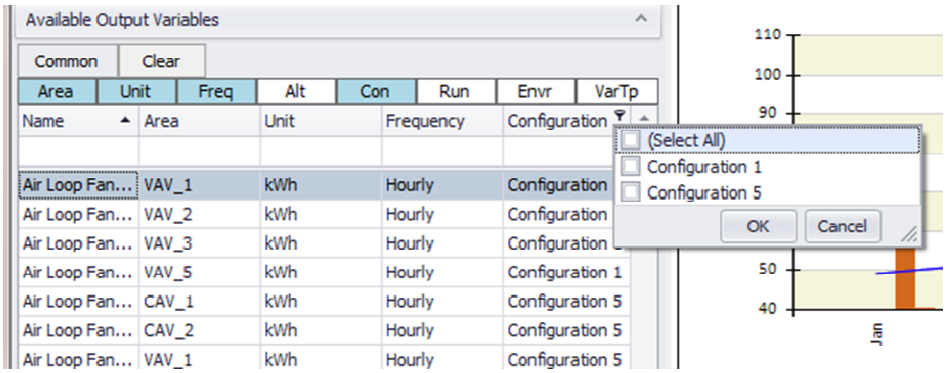




Filter Selections

Each column in the Available Output Variables Table has a filter capability that allows the user to access a list of unique instances for that column. The first image shows the "filter icon" that appears in the Configuration Column when the user hovers their mouse in that area. It also shows the tool tip comment that appears. When the user selects the "filter icon" they are present with a pop-up dialog that shows the unique instances for that column, and allows the user to select them individually or choose "select all".

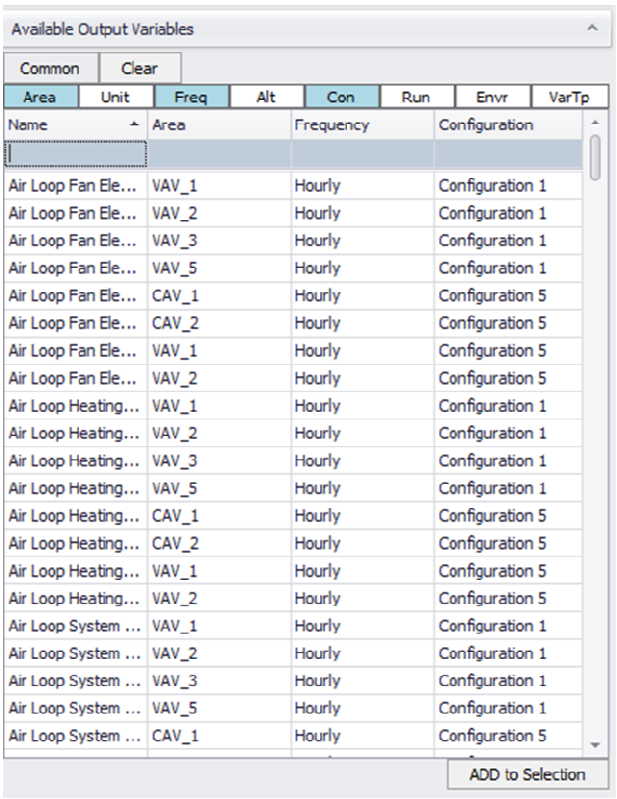


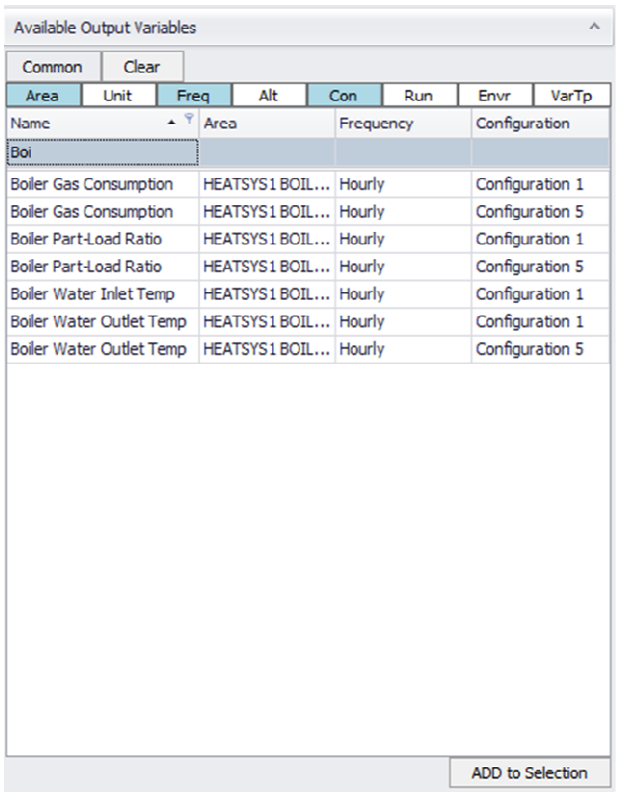


Filter Entry Field

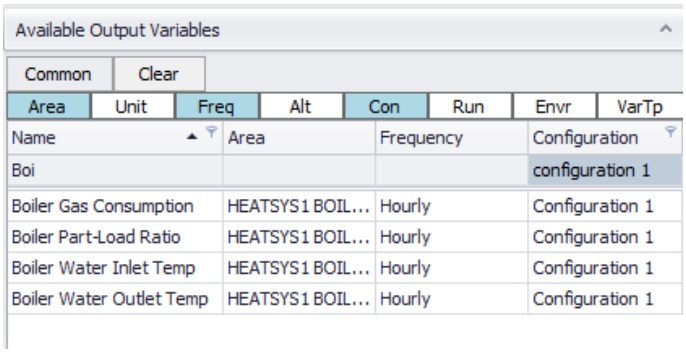
Allows the user to do a "Filter Search" on any column within the table by entering text in the blank row (gray background) for each column. This is a quick way to reduce the size of an Output Request set to isolate the desired Output Variables for selection.

Example: The table on the left is the original Output Variable List for the Output Request Sets of the two Results Sets that are active. By starting to type the word "Boiler", the list of Output Variables has quickly been reduced to a manageable set.





Tip: The text entry filter searches can be used across multiple columns at the same time. See the example below.



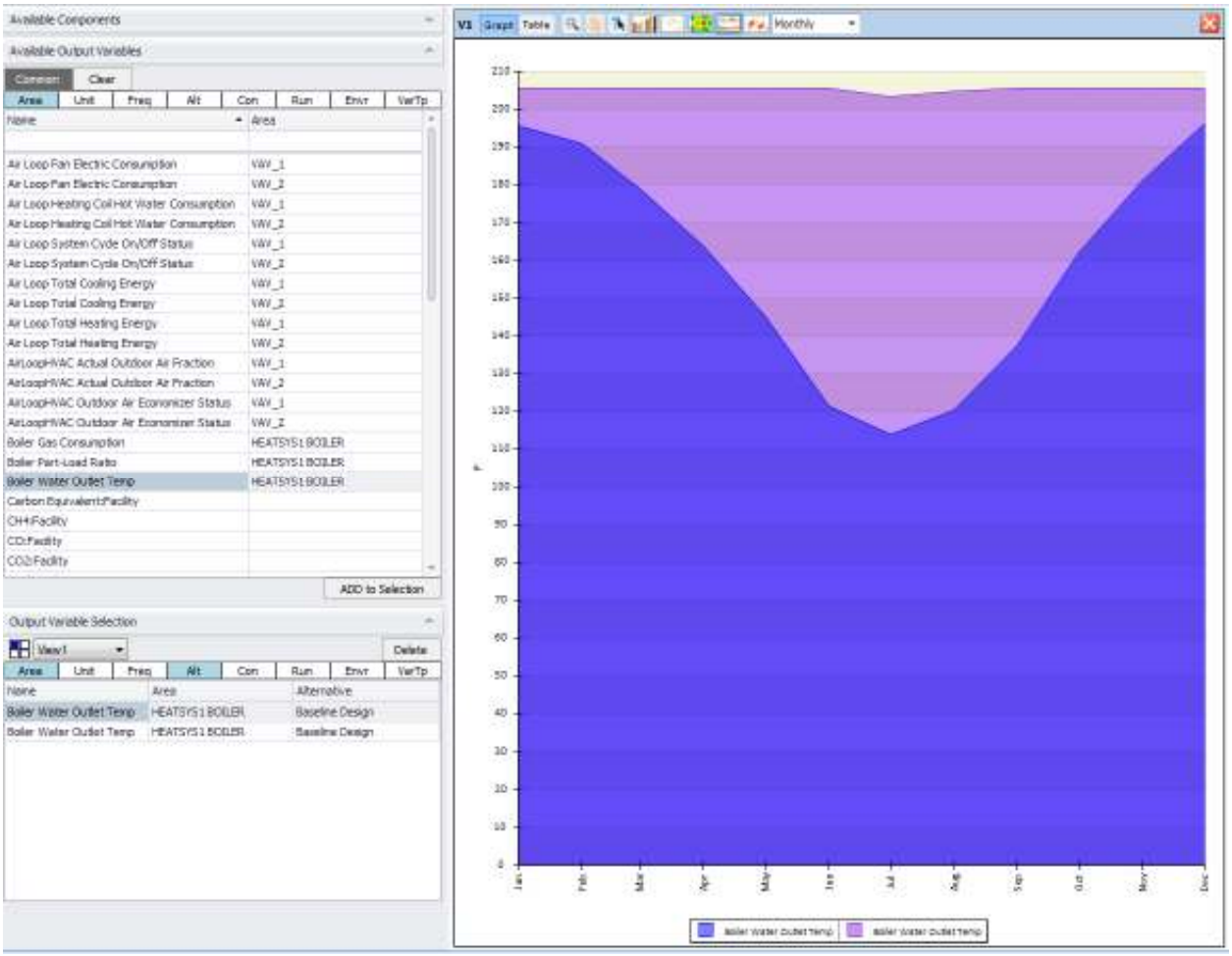
ADD to Selection

ADD to Selection on functions when a user has an Output Variable selected. When the user has an Output Variable selected and they select ADD to Selection, then the Output Variable is added to the Output Variable Selection table and is also added to the active Result View (Default format = Graph, Line Chart)

Note: Only one Output Variable can be added to selection.

*The one **EXCEPTION** is when multiple Results Sets are active and the user has selected the Common Button. The example shows the ADD to Selection for the Boiler Water Outlet Temp Output Variable for the two (2) Results Sets that are active. After ADD to Selection was selected two Output Variables were*

added to the Output Variable Selection Table (one for each Results Set) and they were included in the Results View.



Output Variable Selection Area

The following are features associated with the Output Variable Selection Table area of the Results Visualization Workspace.

Tip: Remember the flow to incorporate Output Variables in Results Views:

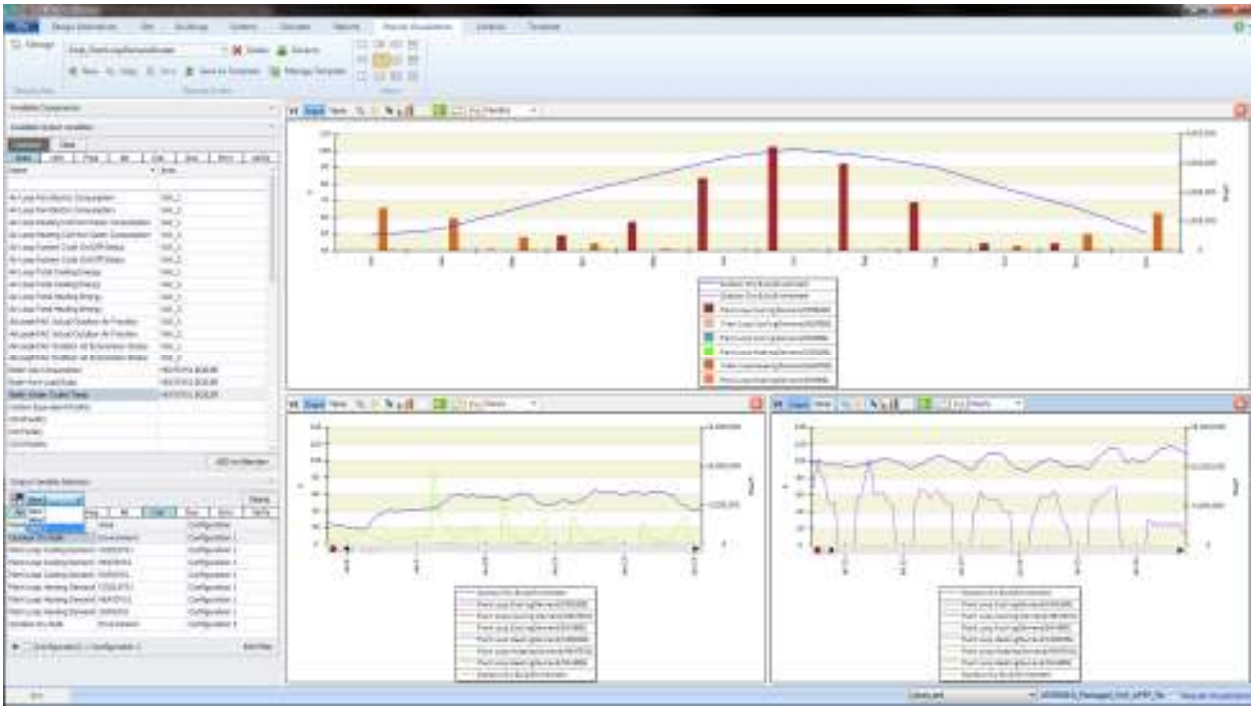
- ***Output Request Set*** *- include desired Output Variable in the Output Request Set (pre-simulation)*
- ***Available Output Variables Table*** *- select the desired Output Variable from the table and select ADD to Selection.*
- ***Output Variable Selection*** *- once an Output Variable has been Added to Selection, then it will appear in this table.*
- ***Results View*** *- once an Output Variable has been Added to Selection, then it will appear in the Result View. (Default format = Graph, Line Chart)*

Active View Control

A drop down list located beneath the Output Variable Selection Header that allows the user to select different views to make active within the current view configuration. If the screen configuration selected has three views, then the drop down list will display three view options for possible selection, as shown in the example below. Once a new result view selection has been made a few things happen:

- The Output Variable Selection Table updates to display the output variables associated with that Results View.
- The Results View border becomes highlighted in blue versus gray (see the image below)

Tip: The user can also change the active view by selecting on the view itself. This action will update the view listing in the active view control drop down list as well. It will also update the icon to the left.



Column Header Buttons

The eight column header buttons are always shown and they function as toggles to turn on or off the view of that column within the table. When the Header Button has a "bluish background" it means that column is active. Space is at a premium in the interface and this enables the user to work more effectively with the table to review a range of different information that could be important to determine which output variables are the best to select are.

The table identifies the eight column headers and shows the abbreviations that are used within the interface.

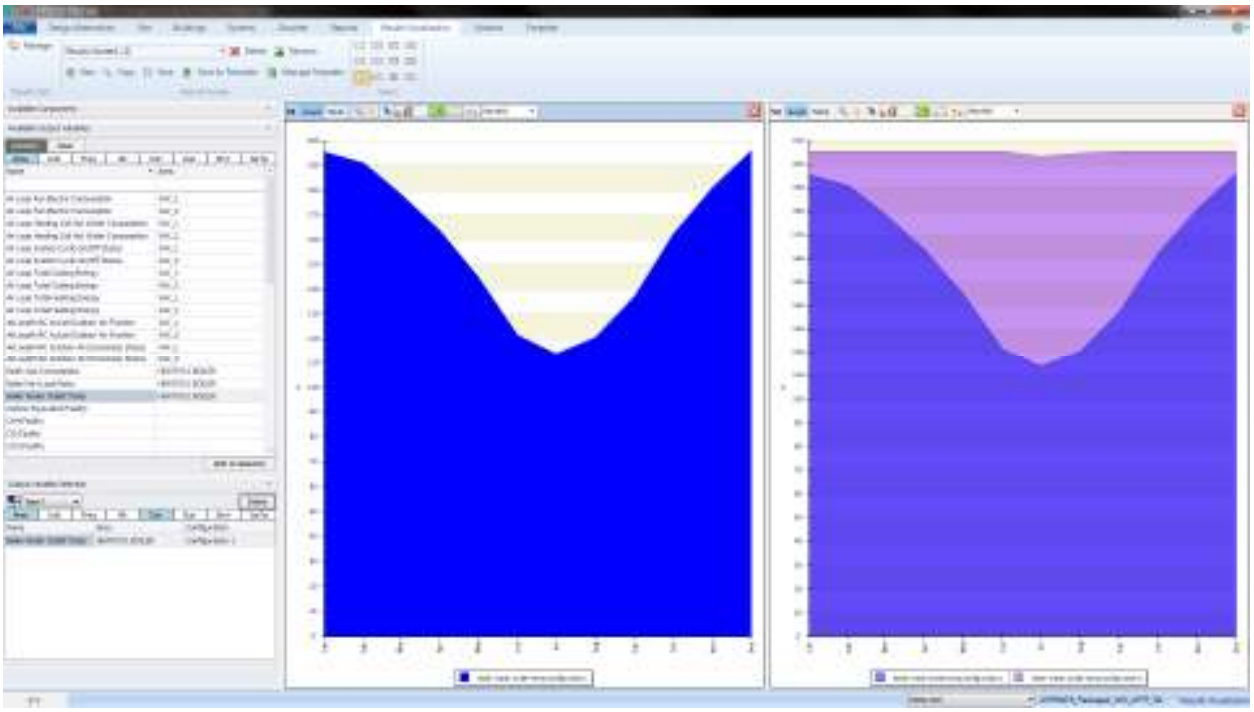
Note: The Name Column is always displayed and it does not have a Header Button.

Abbreviation	Full Name
Area	Area
Unit	Units
Freq	Frequency
Alt	Design Alternative
Con	Simulation Configuration
Run	Simulation Run Name
Envr	Environment
VarTp	Variable Type

Delete Output Variables

Selecting Delete will remove the current output variable highlighted (grayish-blue background) within the Output Variable Selection table from the table as well as from the current Results View. Initially after selecting Delete, the user will be prompted with a message "Are You Sure You Want To Delete the Output Variable?" and is provided with a Yes or No option.

Example: shows what were previously two Results Views with the same Output Variable Selections. V1 (the one on the left) has just had the "Boiler Water Outlet Temp" for Configuration 5 deleted. Now there is only one output variable shown in the table and the graph has also changed and only the single Output Variable is displayed.

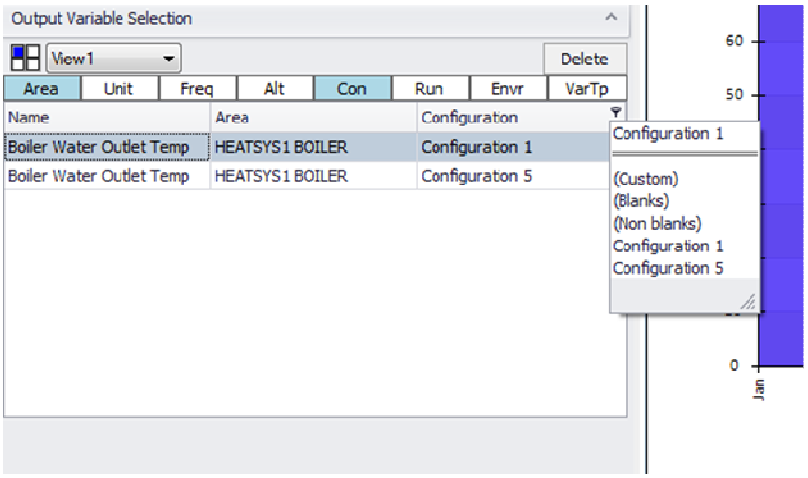


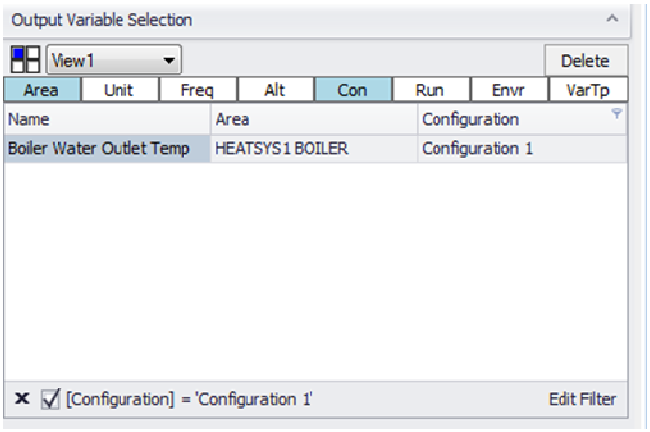
Filter Selections

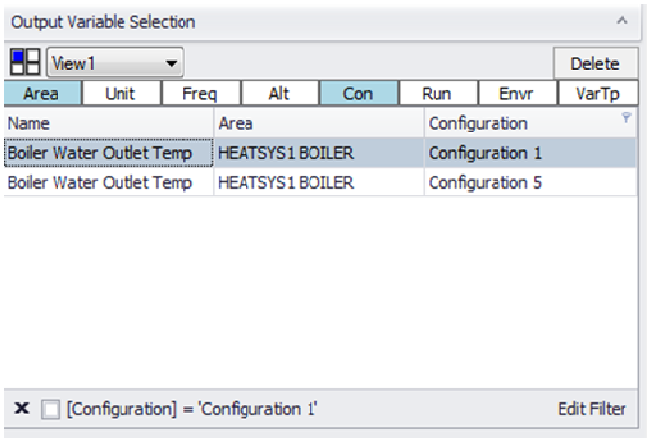
Each column in the Available Output Variables Table has a filter capability that allows the user to access a list of unique instances for that column. The three images below identify some of the filter capabilities. In the first image the user hovers over the configuration column with the mouse to expose the "filter icon". They then select the "filter icon" to display the filter options available (which differ in capabilities from the filter features associated with the Available Output Variable Table).

By selecting "Configuration 1" we see that in the 2nd image the Configuration 1 Output Variable remains and the Output Variable for Configuration 5 is hidden. Also note that a check box and listing for "Configuration 1" has appeared at the bottom of the table.

If we deselect the check box we see that the Configuration 5 Output Variable appears again, because the filter has been turned off. However the filter listing remains at the bottom. If we want to apply the filter again, we just need to reselect the check box. However, if we want to remove the filter we need to select the "x" to the left of the check box.







Output Variable Selection Table

The table is the 'receiver' for the Output Variables that are Added to Selection from the Available Output Variable Table. The table displays the Output Variables associated with the active Results View. When a different Results View is selected, the Output Variables displayed update. The row of the selected Output Variables has a gray background, and will be the output variable deleted if the delete button is selected. Only one Output Variable can be selected at a time, which means only one Output Variable can be deleted at one time. When an output variable is deleted from the table it is also deleted from the Results View.

Results Views

Simergy 3:

1. *Result Sets Output Variables are displayed in the **Available Output Variables Table***
2. *Selected Output Variables are added to **Output Variable Selection Table***
3. *Selected Output Variables are displayed in **Results Views**.*

Tip: Remember the flow to incorporate Output Variables in Results Views:

- ***Output Request Set** - include desired Output Variable in the Output Request Set (pre-simulation)*
- ***Available Output Variables Table** - select the desired Output Variable from the table and select ADD to Selection.*
- ***Output Variable Selection** - once an Output Variable has been Added to Selection, then it will appear in this table.*
- ***Results View** - once an Output Variable has been Added to Selection, then it will appear in the Result View. (Default format = Graph, Line Chart)*

View Edge Controls

Graph or Table Toggle

The two buttons that allow the user to switch the results view from graph to table or vice versa. The default for all results views is graph.

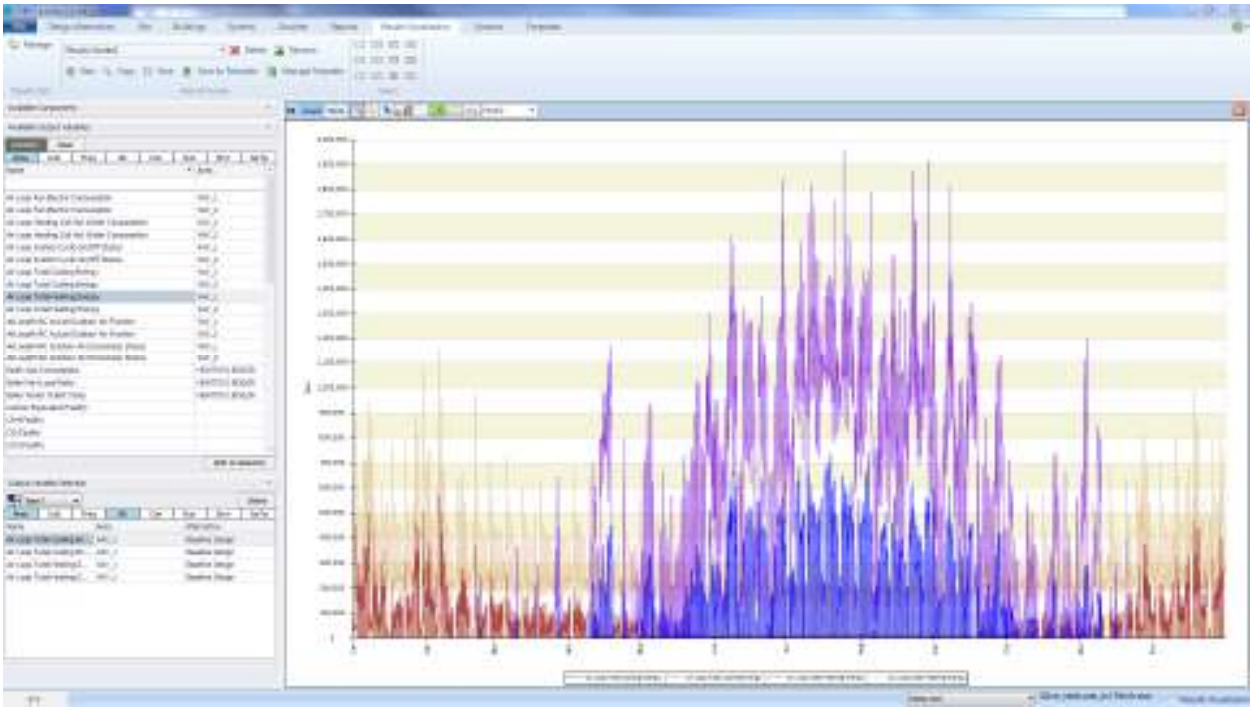
Data Zoom

The combination of Data Zoom with the Results View Controls provide a number of zoom features to the user.

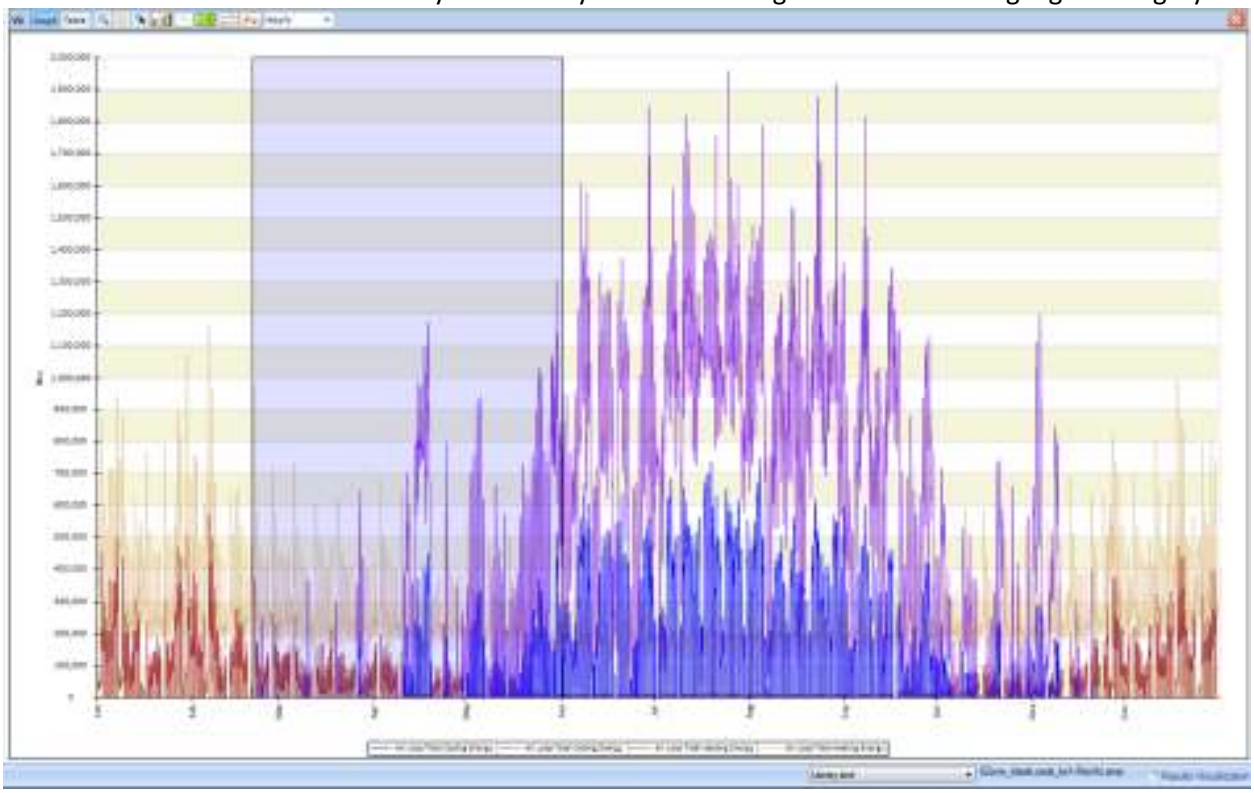
Example - Data Zoom

The example walks through the different features that can be used in a number of different combinations.

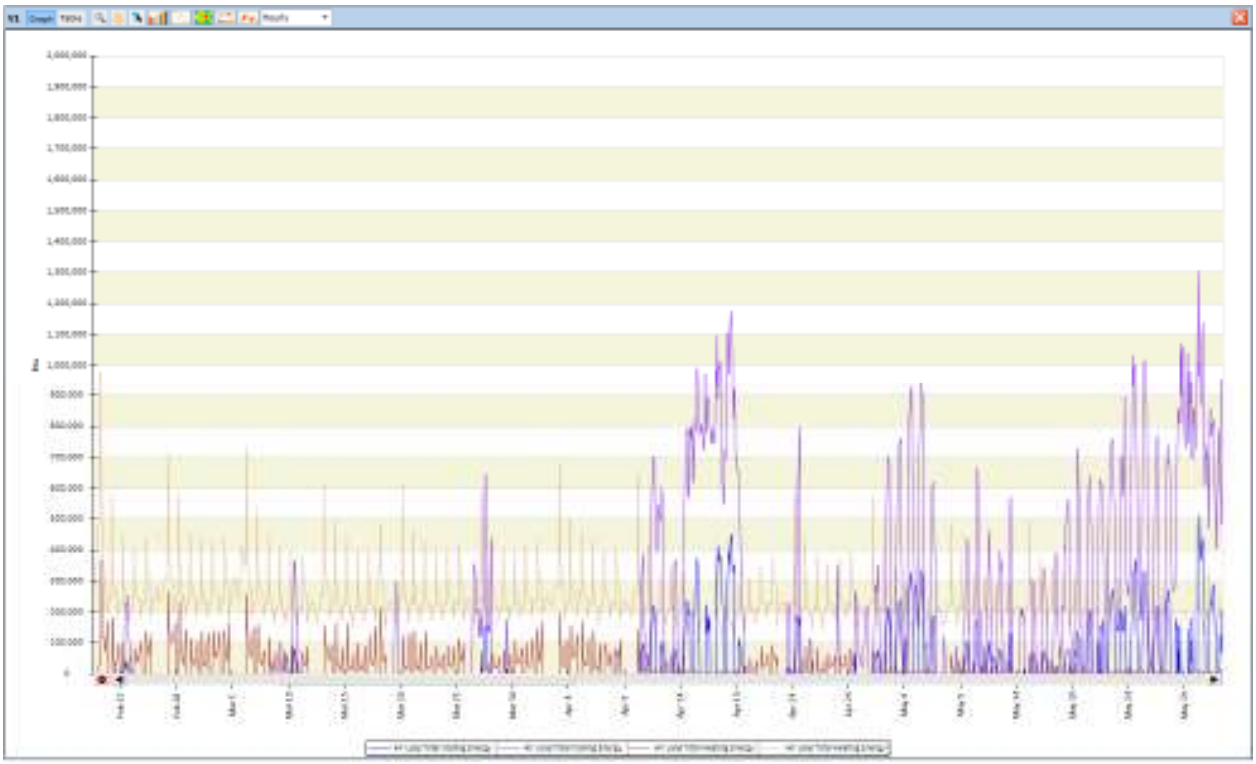
Example: the user has set up a Results View showing four output variables, which are the Air Loop Total Heating and Cooling Energy associated with two Results Sets. The view shown is the default hourly, line graph results view.



Selecting the data zoom icon, the user can select a range of months to highlight. The example below shows a selection from Mid-February to late May. The area being selected will be highlighted in gray.



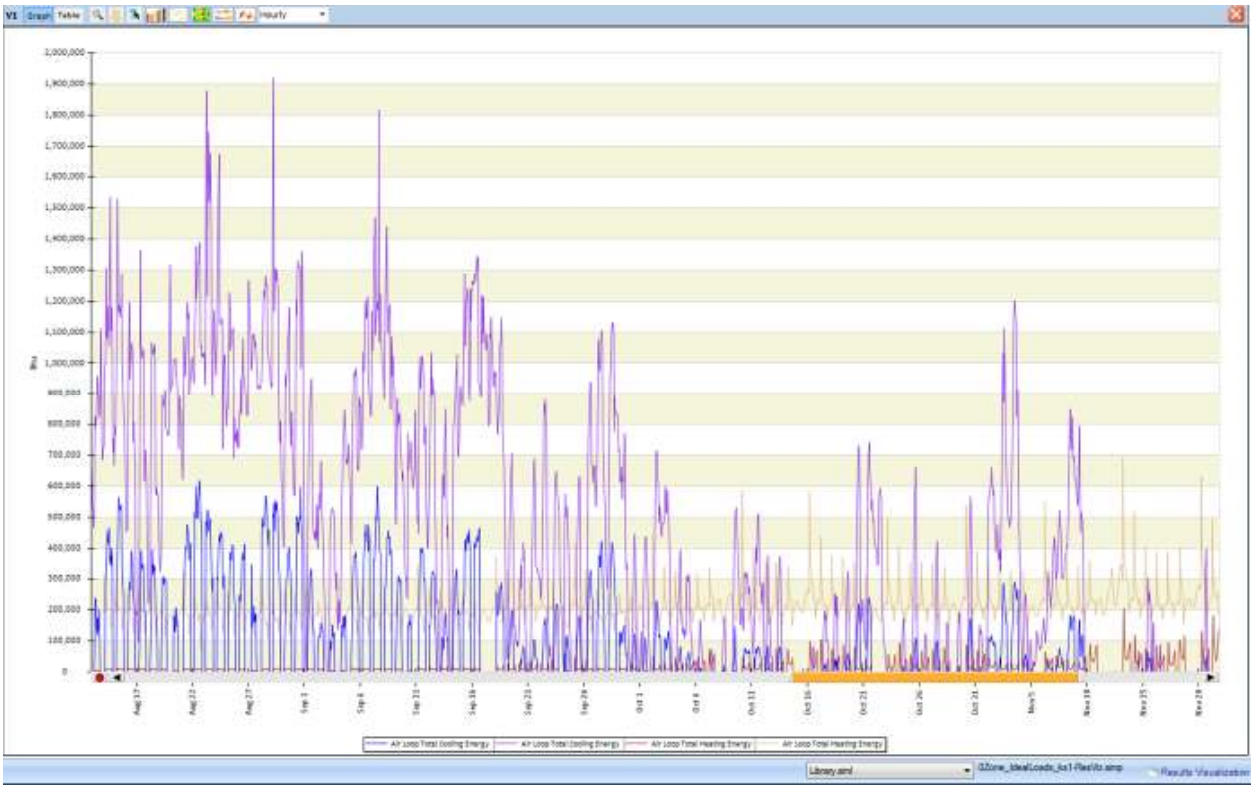
When the mouse is released the range selection is determined, and the results view of that selection will be displayed.



Some additional features appear on the graph for this data zoom view:

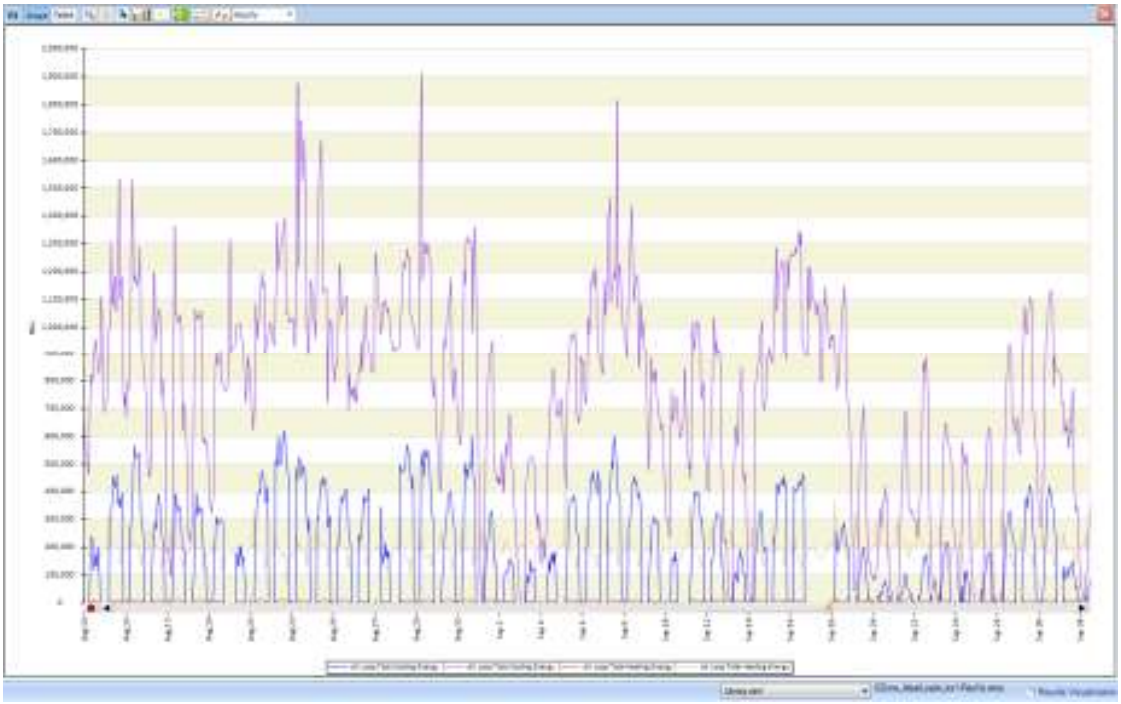
- **Red dot** (lower left of graph) - by selecting it allows the user to go one zoom step back. This can be helpful if the user has done multiple zoom steps and just wants to get back to the previous one.
- **Slider bar** (lower part of graph above x-axis labels) - has three components
    - **Left Range Boundary** - by selecting and dragging it allows the user to lengthen or decrease the range of time that is being displayed in the Results View
    - **Range Bar** - allows the user to keep the same "range of time" for the Results View and to change the time of year that is being displayed.

Example: rather than looking at Feb. to May, by selecting the "range bar" and sliding it to the right the user could move the time range to focus on mid-August to mid-November.



- **Right Range Boundary**- by selecting and dragging it allows the user to lengthen or decrease the range of time that is being displayed in the Results View

Example: If the user wanted to shorten the range displayed from mid-November to the end of September, they just need to highlight the "Right Range Boundary Button" (to the right of the longer bar) and then drag it to the left until they reach the desired end day for the time range they are interested in..



The user can continue to use any combination of the zoom features to continue zooming in on a particular range of time. However if the user has the desire to get back to the original default view for the graph, they can select the data zoom icon again, which will take them back to the default view.

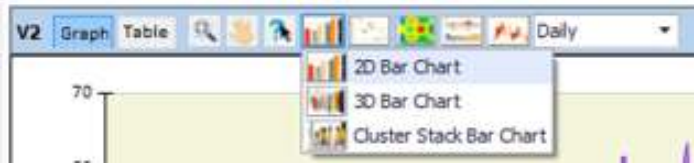
Data Pan

Always you to freely move about the cabin, we mean graph. Similar to typical pan features.

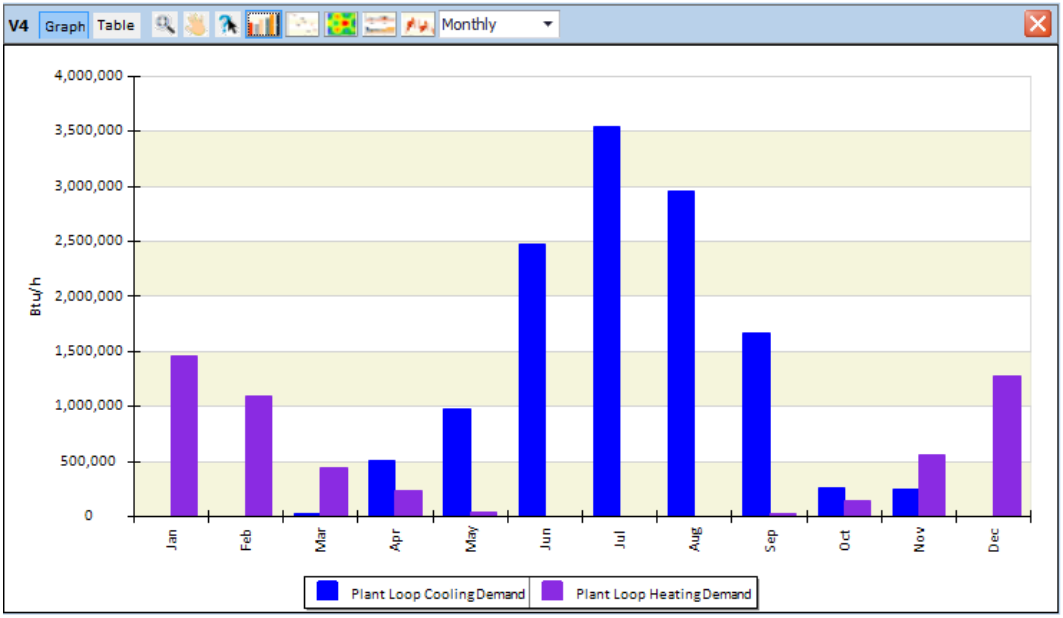
Data Track

Once selected when you slide over the graph you can view the actual values of different points on the graph.

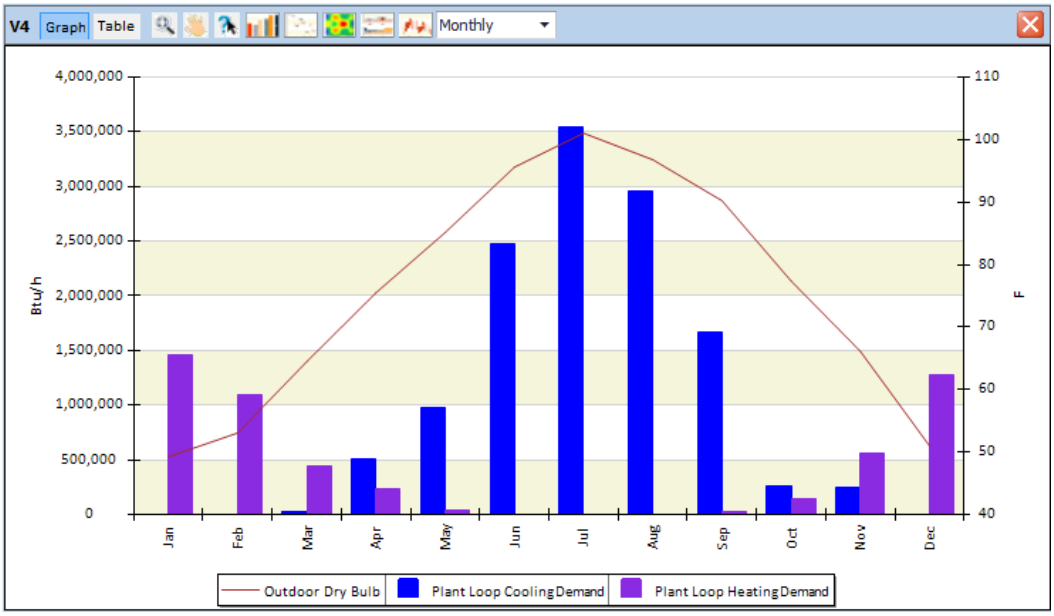
Bar Charts



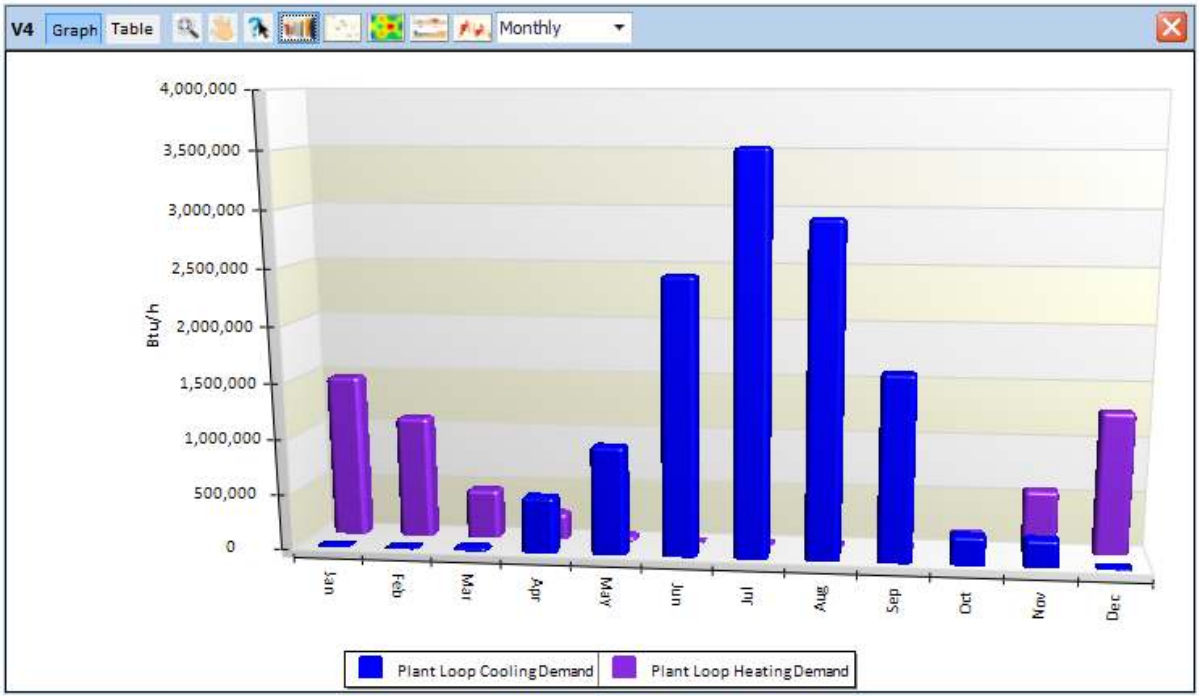
2D Bar Chart



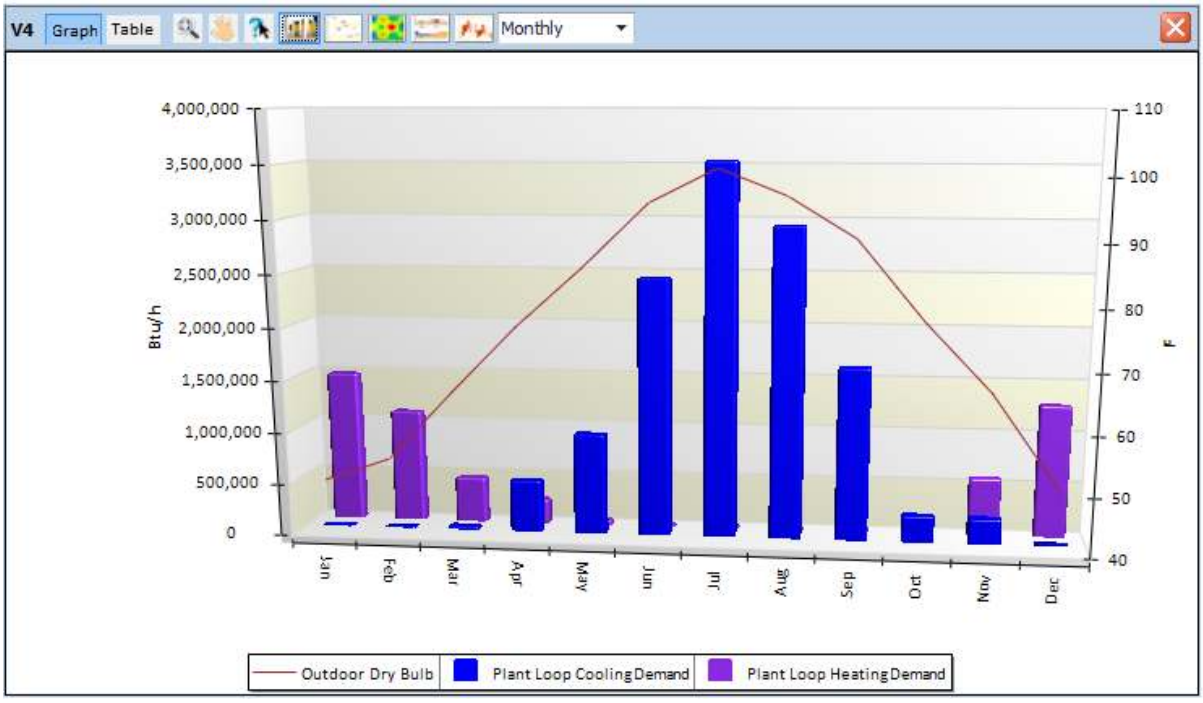
Including Environment Output Variable



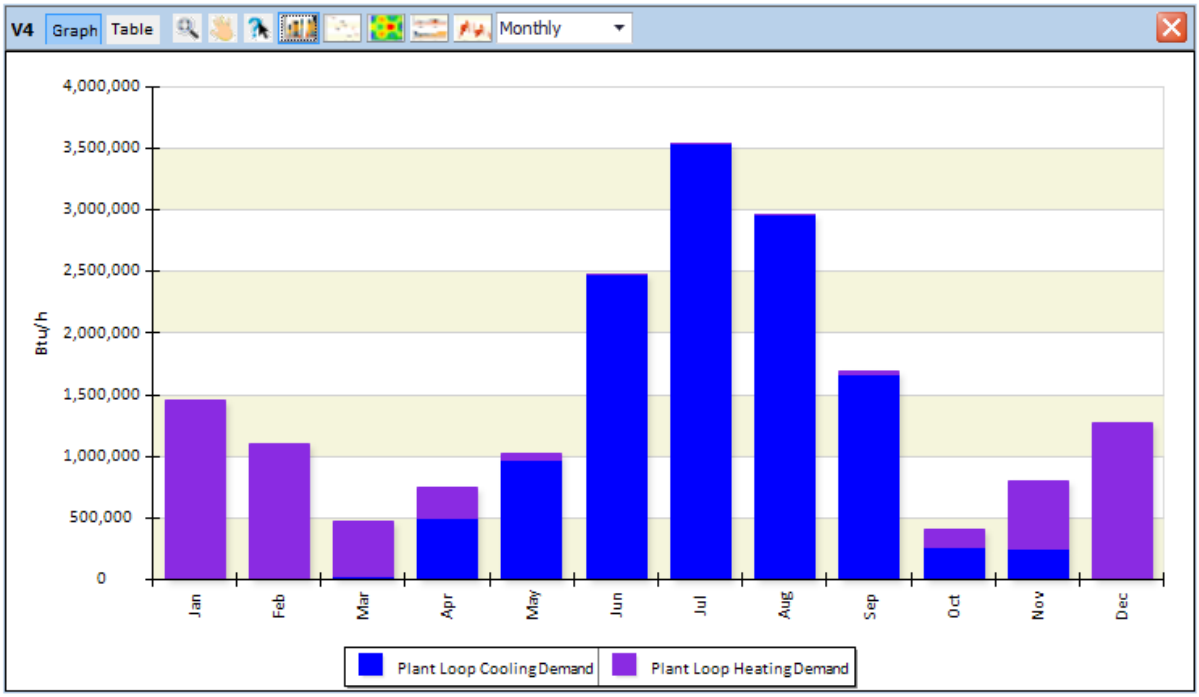
3D Bar Chart



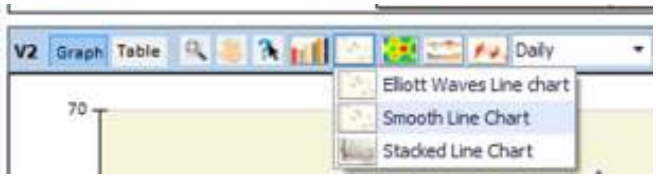
Including Environment Output Variable



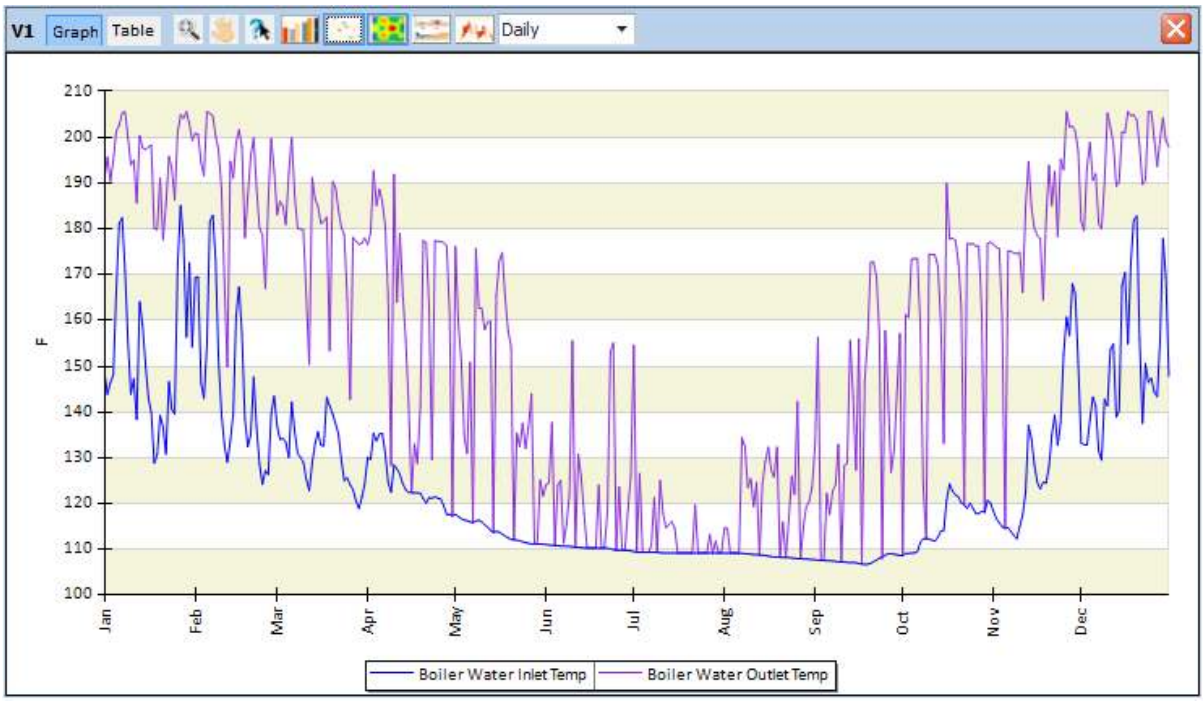
Cluster Stack Bar Chart



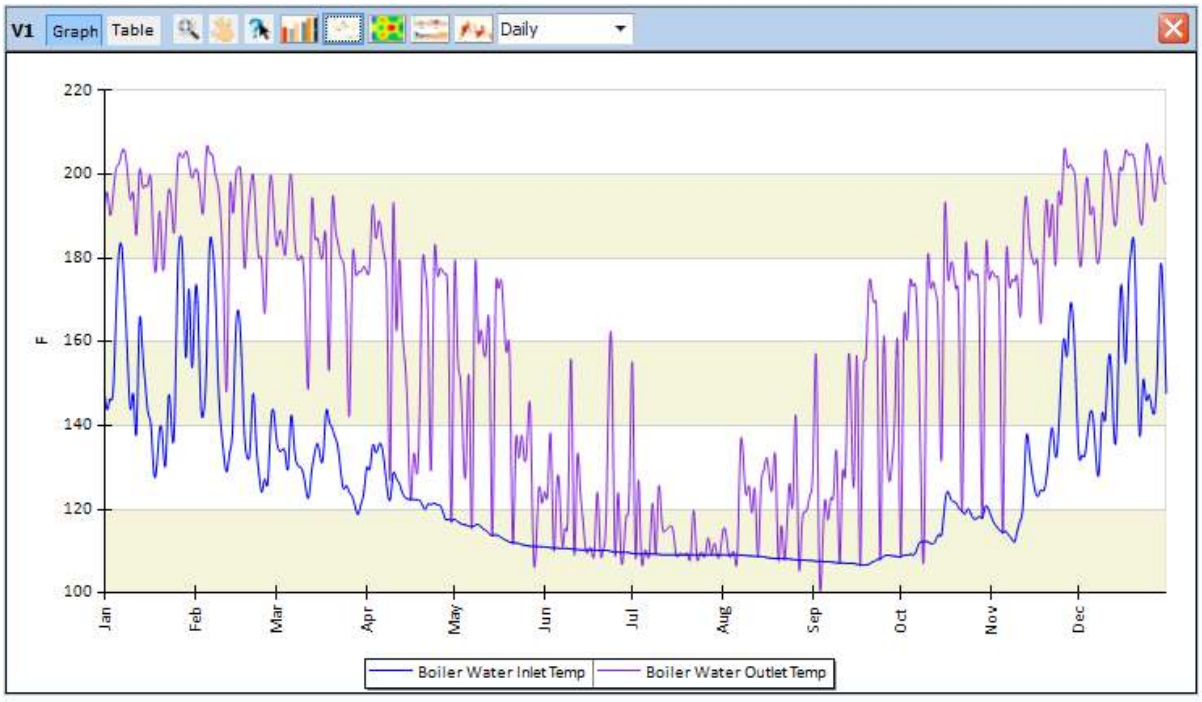
Line Charts



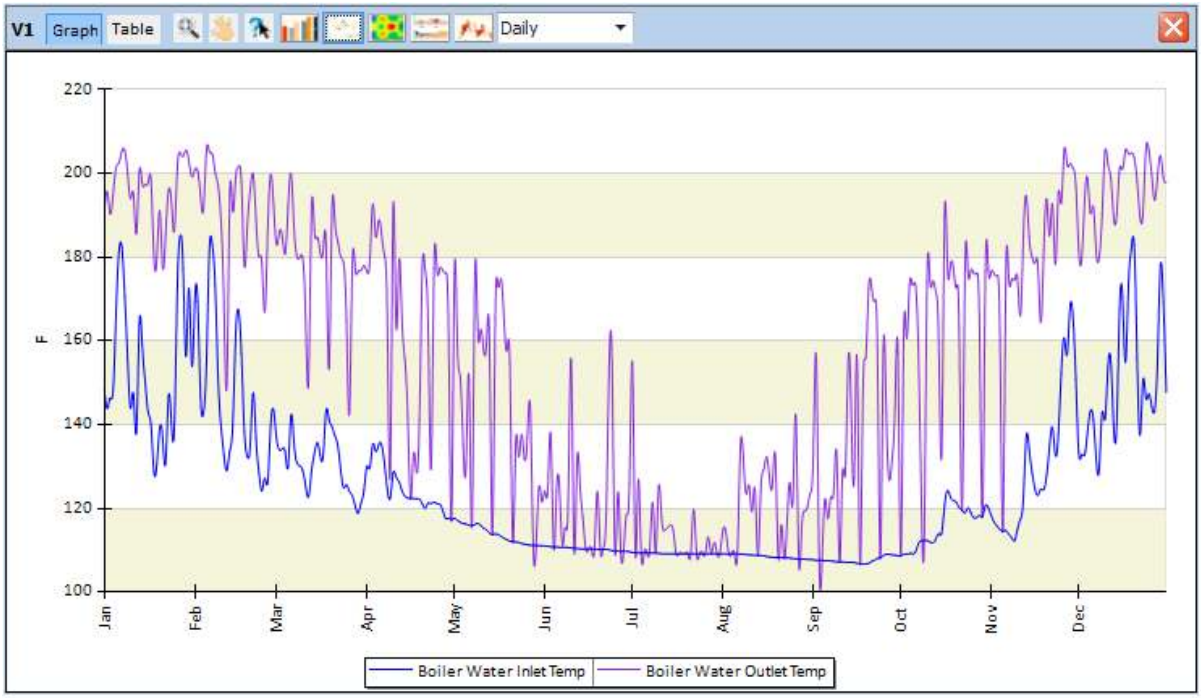
Elliott Waves Line Chart



Smooth Line Chart

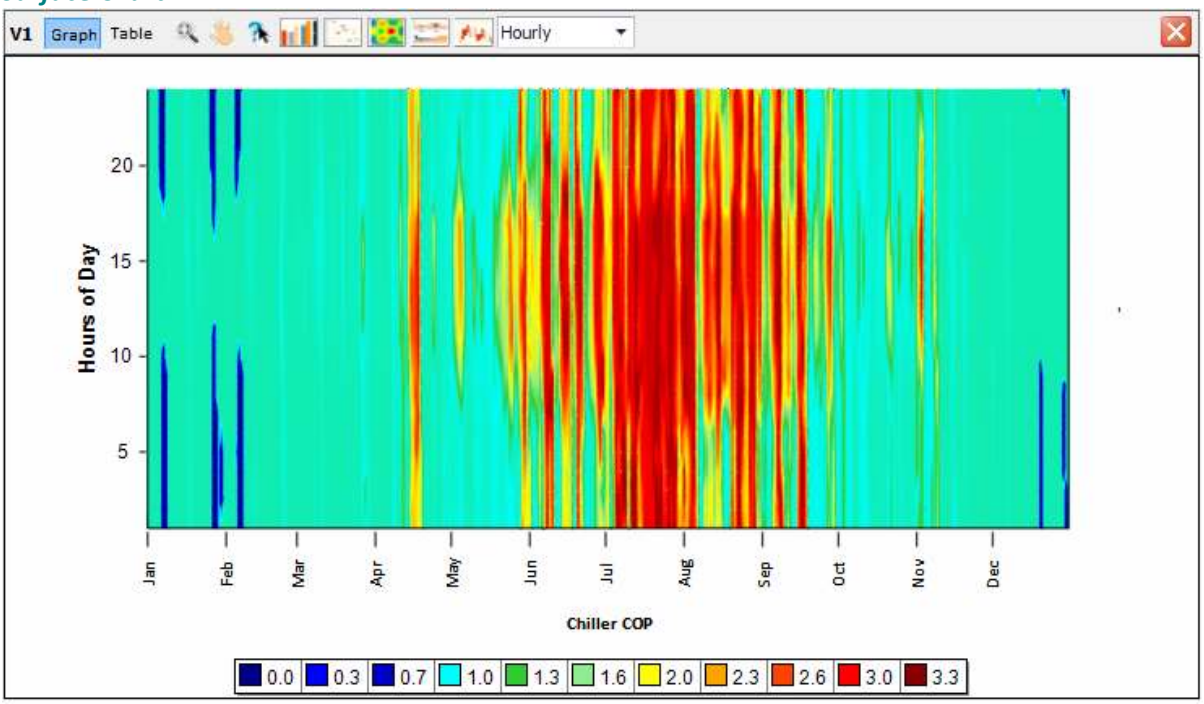


Stacked Line Chart

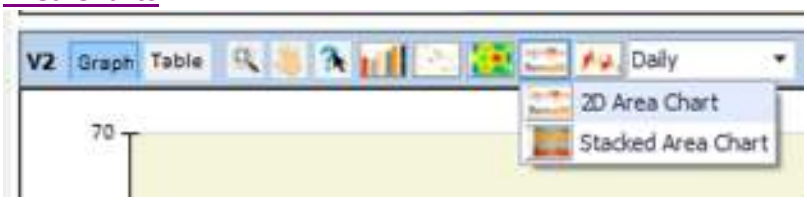


Surface Charts

Surface Chart

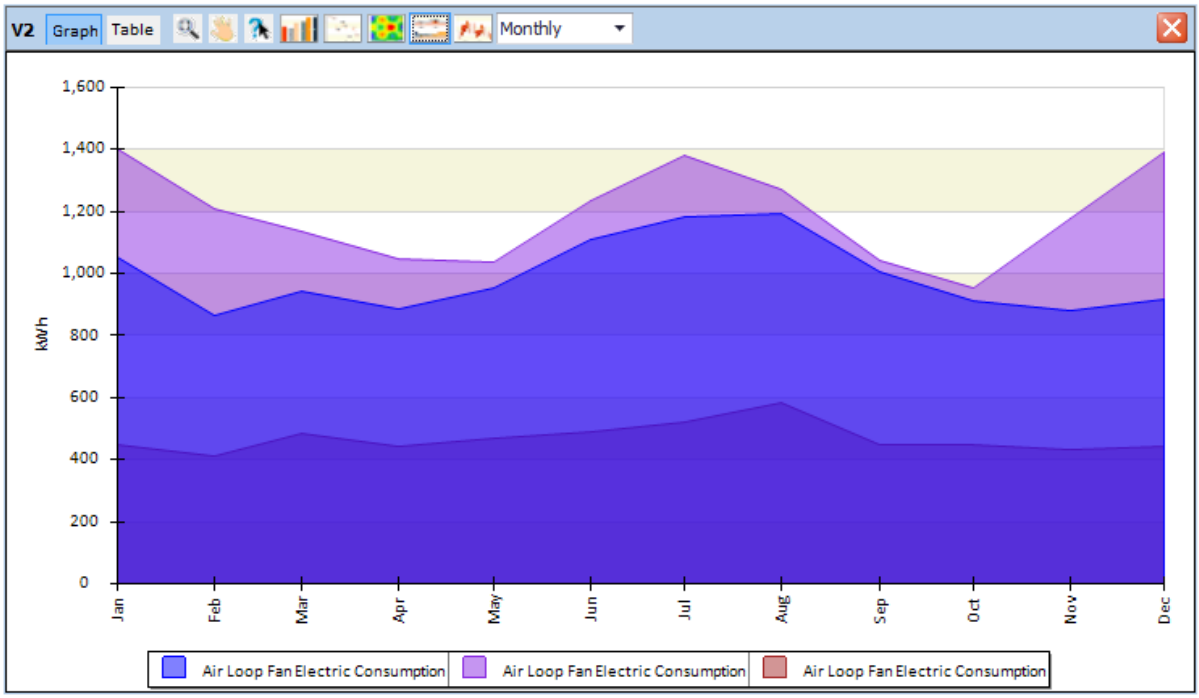


Area Charts

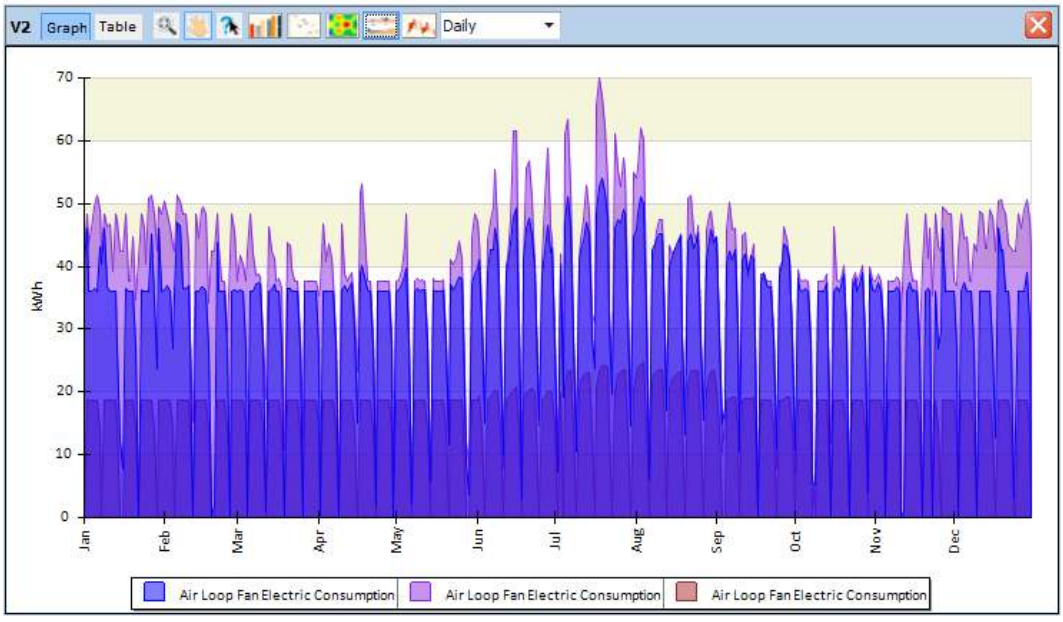


2D Area Chart

Monthly 2D Area Chart



Daily 2D Area Chart



Stacked Area Chart

Range Charts

2D Floating Bar Chart

2D High Low Chart

Box and Whiskers Chart

Frequency Controls

Frequency Drop Down List

You can change the frequency displayed in the graph by selecting on the drop down arrow and selecting from the following options:

- Timestep
- Hourly
- Daily
- Monthly
- Run Period

Note: The default frequency displayed in the Result View is determined by the frequency associated with the Output Variable that was added to the Result View.

Available frequencies are influenced by the frequency selected within the Output Request for the Output Variable that is included in the Output Request Set Template that has been selected in the Simulation Configuration.

Right Click Features

Export

Allows you to save a copy of the active Results View. The file format options are:

- Bitmap Image (.bmap)
- Gif Image (.gif)
- JPEG Image (.jpg)
- PNG Image (.png)
- Tiff Image (.tif)
- Emf Image (.emf)

Copy

Makes a copy of the active Results View (clipboard) that can then be pasted into another document

Print

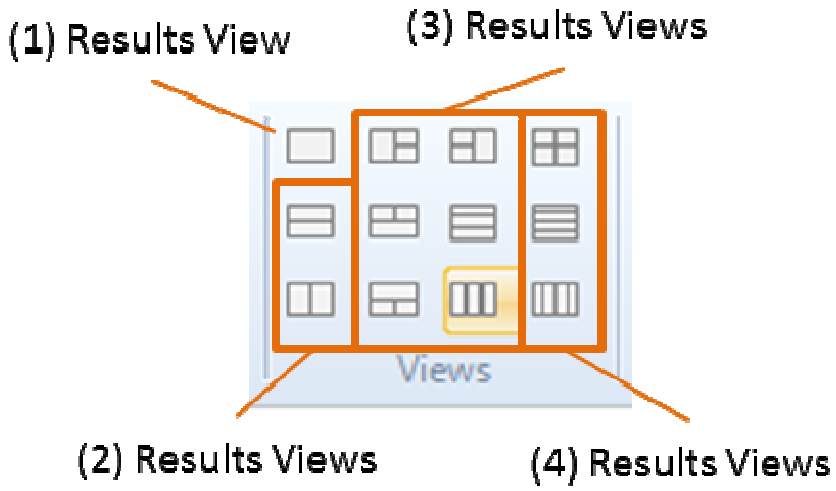
Launches a print dialog box allowing you to print a copy of the active Results View

Properties - Graph Properties Dialog

Properties - Table Properties Dialog

View Configurations

The View Configuration icons provide twelve different screen configurations of Results Views ranging from one (1) results view to four (4) results view. The user can change the Results Views Area configuration by selecting on any of the different icons. You should be aware of behavior when you ADD or REDUCE the number of Results Views, so that you can save time. If you select an icon with the same number of results views the Results Views area will just be reconfigured displaying the new arrangement. Once a view configuration icon has been selected it will remain highlighted, until another one is selected.



When the user first arrives at the Results Visualization Workspace one Results View (top left icon) is shown as a default. The Results Screen Templates that are installed with Simergy and that you can set up, contain multiple results views that will appear automatically.

Tip: When the user is keeping the same number of Results Views they can select any of the icons with the same number of Results Views to easily reconfigure the screen layout. See the example below of three different screen views of the same three Results Views. They were changed by just selecting the different view configuration icons for three results views.

Adding Results Views

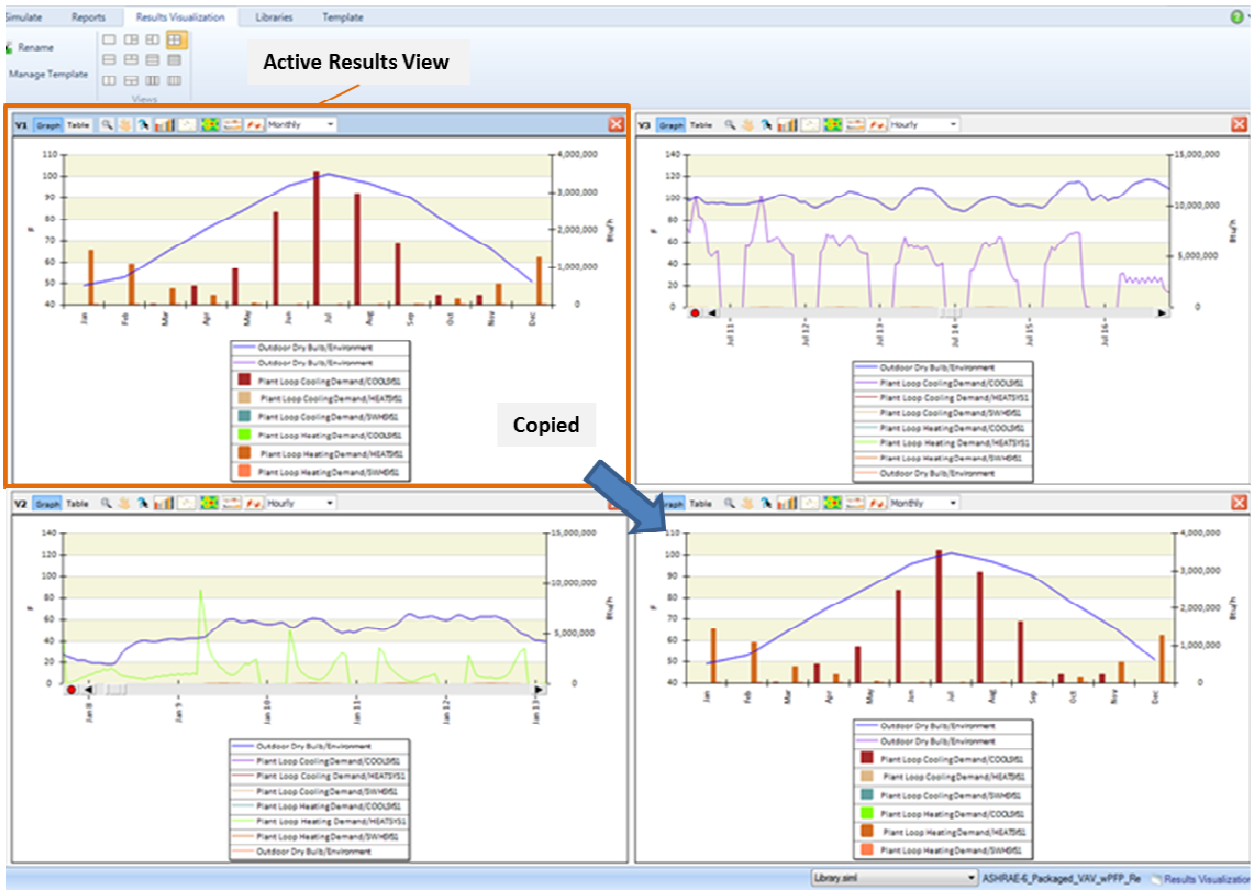
To add Results Views to the screen you just need to select a view configuration icon that has at least one more results view than the one you currently have active. You can also choose a view configuration icon that has more than one Results View than the previous. What happens is that the current Results View that is active gets copied the number of times that is required to reach the total number of results views

in the selected view configuration icon. For example, if one results view is currently shown and the user selects a view configuration icon with four views then the current view will be copied three times and the result will be the same results view shown in all four views of the new configuration.

Example: Increasing the number of Results Views displayed from three to four

The first image shows the Results View Area with three results views shown. Note the view configuration icon highlighted in the upper left, and that V1 (View 1) is active.

Now if you select a view icon with four results views (note a different view configuration icon has been selected in the image below), the Results View Area changes to show four (4) Results Views and the fourth Results View that is added is a copy of the active Results View.

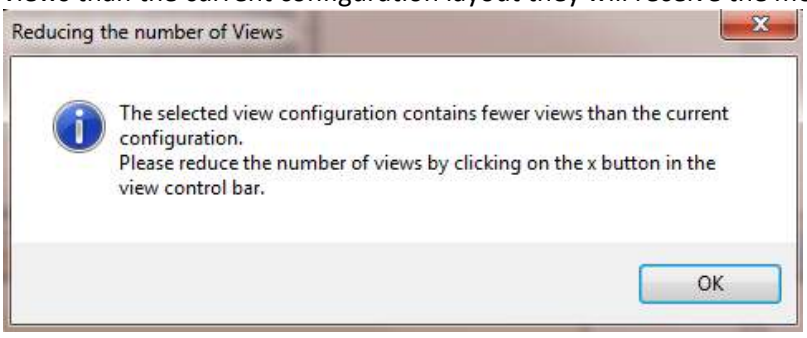


Tip: Before a user selects a view configuration icon that is increasing the number of views make the view with the least number of output variables associated with it active. Since the current view is the one copied, if there are a number of output variables associated with it, those will most likely need to be deleted, so that the user can start to add other useful output variables to the view.

***Best Practice:** If the user knows that they will be utilizing multiple results views, before starting to add output variables to any results view, select the view configuration icon that contains the desired number of views. The result is that the user will have a "blank slate" to start with for each view and will not be required to delete output variables that have been copied from another view.*

Reducing Results Views

Reducing views is a slightly different approach. If the user selects the view configuration icon with fewer views than the current configuration layout they will receive the message.



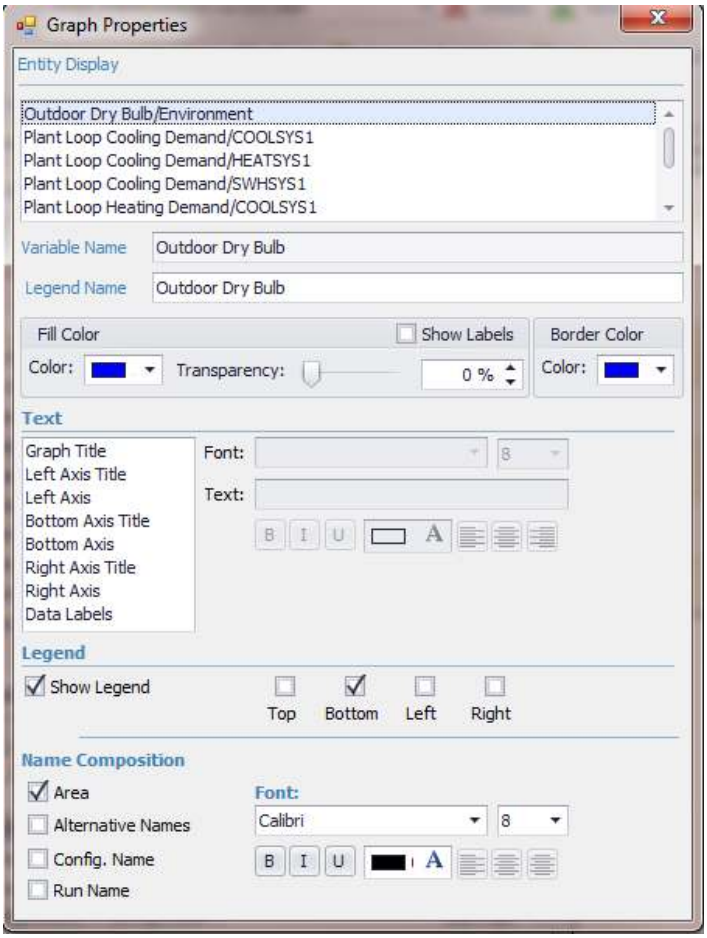
The result is that the user will have to hit OK, and then do the following, which they could do right from the start.

To reduce the number of views displayed just choose the view to close, and hit the "X" on the upper right of the border. This action will reduce the number of views by one and reconfigure the screen. If the view configuration is not the desired format for these views just select the view configuration icon from the ribbon for the same number of views that matches the desired configuration.

Results Views - Graph Properties Dialog

The following are features available in the Graph Properties Dialog box, which can be accessed by the user by moving their mouse within a Results View, then right click on the mouse and select Properties from the pop-up dialog. The properties that can be edited in the dialog are only related to the Results View they were selected.

Note: A user right clicking on a graph view will take them to the Graph Properties dialog, and a user right clicking on a table view will take them to the Table Properties Dialog.



Entity Display

Output Variable Names

A list of the output variables that are currently included in the Results View and how they will be displayed within the Results View legend. By selecting one of the output variables, the name appears in the Variable Name field and the Legend name field, which can be edited. The name displayed in this field can also be changed by selecting or de-selecting options for parameters within Name Composition.

Variable Name

Allows the user to change the text representation of the variable name.

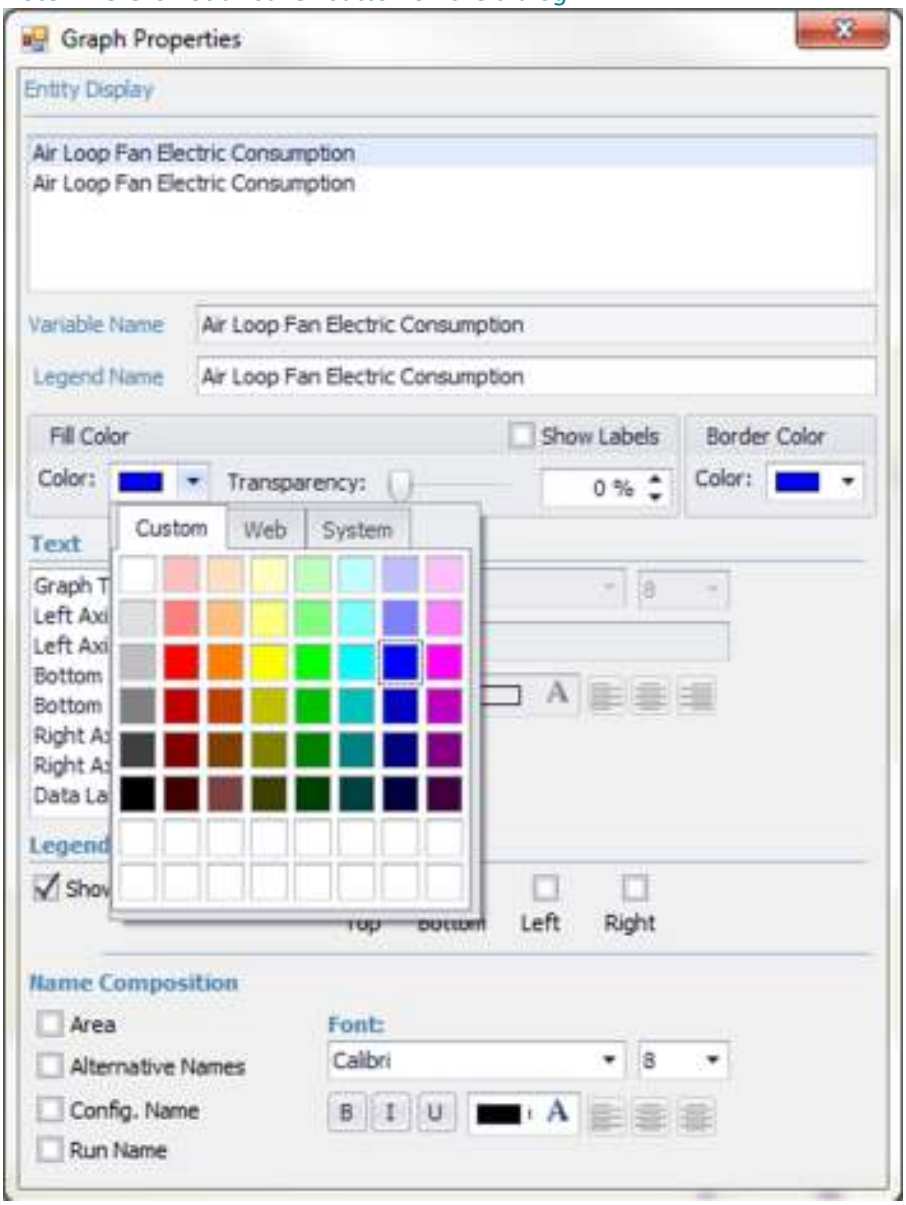
Legend Name

Allows the user to change the text representation of the legend name. For example, the user may want to shorten the name so that it fits better within the legend and the legends location on the graph.

Fill Color

The color for the output variable selected will be shown. To select a different color select the chevron and the options for colors shown below will be displayed. The user can select from colors on the "custom" tab, which will be the current tab, or the "web" or "system" tab. By selecting a new color, it will automatically be associated with the output variable.

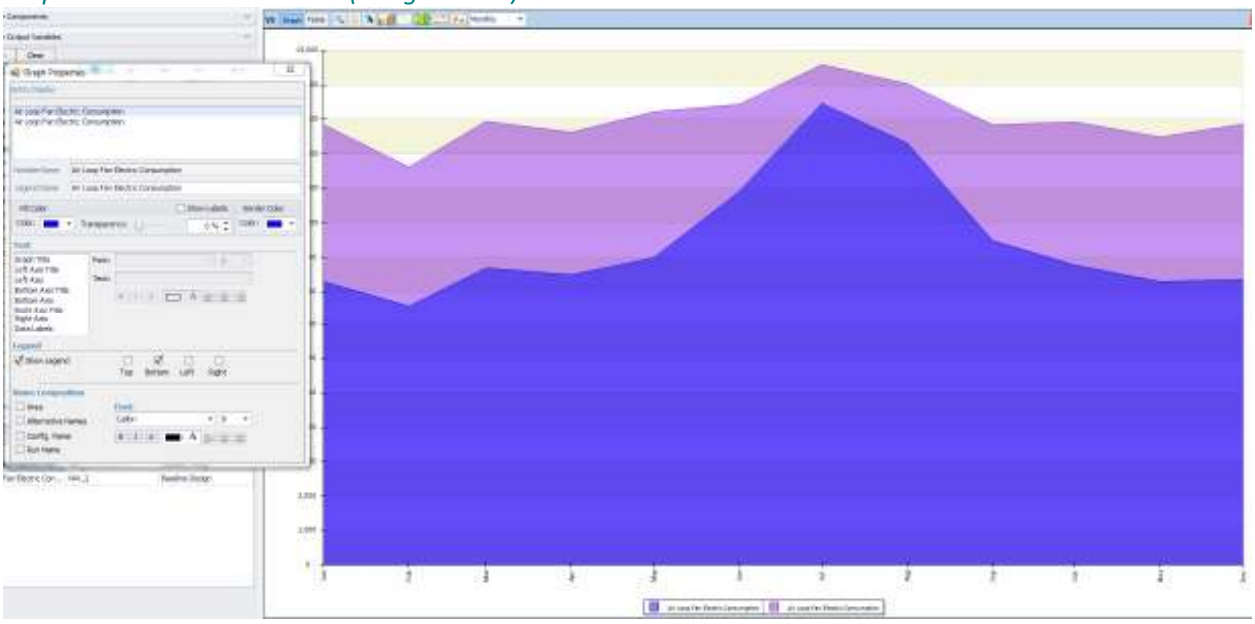
Note: There is not a "save" button on the dialog.



Fill Transparency

Allows the user to change the transparency of the display for the selected output variable. This feature may be useful for certain graph types more than others. The user can either adjust the transparency using the slider bar or they can increase or decrease the transparency % by selecting the up or down chevrons or they can enter a direct value.

Note: If multiple output variables are associated with a graph view that is being displayed as an area chart, Simergy by default will incorporate transparency on the output variables, so that initially all of the output variables can be seen (image below).



Show Labels

Provides the option to turn on labels for the current output variable by selecting the checkbox. The label values will be shown at the middle of the output variable selection, and currently the user does not have control over the location, they just have the choice of displaying or not displaying the label values. *Note: Show labels only affects the output variable selected, not all of the output variables in the view. If the user wants to display labels for the other output variables they will need to select them and select the check box for show labels.*

Border Color

Controls the color display for the outline of the output variable representation on the graph type. By selecting the drop down within the field, the user is presented with the same selection options as with the "fill color" shown above.

Name Composition

Check Box Options

To allow the user the ability to differentiate between the output variable names for multiple results sets output variable names the four selections of area, alternative names, configuration name and run name are available for selection. By selecting the check box, such as "area" in the image above, the area name associated with that output variable is displayed after the output variable name shown in the field below Entity Display. Multiple selections can be made and the order in which they will be incorporated with the output variable name are in the order that they are shown. For example, "area" will always be shown before "configuration name", if they both are selected, and "configuration name" will always be shown before "run name" when they both are selected. Each name composition selection that is chosen will be shown after a "/" that is included to show the user the break in the different parts of the output variable name that will be displayed on the legend.

Font

The drop down list provides access to the different available fonts associated with the operating system. In addition the user can change the font size as well.

Formatting

Typical formatting capabilities are available including bold, italics, underline, font color, and alignment (left, center, right).

Text

The user can change the text displayed and the format of the text for a number of components of the results view, depending on if they are displayed or not.

Text Selection Options

The text components of the results view that can be adapted are:

- Graph Title
- Left Axis Title
- Left Axis
- Bottom Axis Title
- Bottom Axis
- Right Axis Title
- Right Axis
- Data Labels

Selecting a component from the list makes that text component active, and any changes made are only associated with that text component.

Font Type

The drop down list provides access to the different available fonts associated with the operating system. In addition the user can change the font size as well.

Text Title

The default text associated with the text component will be displayed, which the user can edit.

Formatting

Typical formatting capabilities are available including bold, italics, underline, font color, and alignment (left, center, right).

Legend

Show Legend

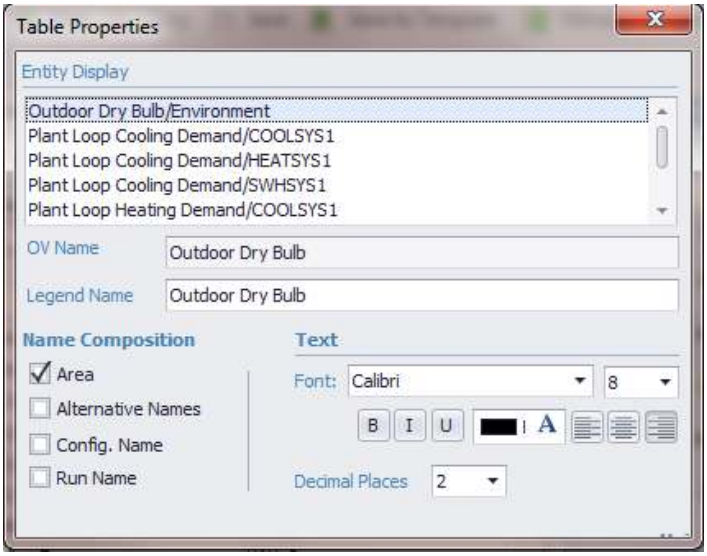
Show Legend checkbox selected (default) means the legend is displayed. Deselecting the checkbox hides the legend.

Legend Alignment

The user has the ability to select one of four locations for the legend - top, bottom (default), left or right.

Results Views - Table Properties Dialog

The following are the features that are available in the Table Properties Dialog box, which can be accessed by the user when they have their mouse with a Results View that is displaying a table, they right click and select Properties from the pop-up dialog.



Entity Display

Output Variable Names

A list of the output variables that are currently included in the Results View and how they will be displayed within the Results View legend. By selecting one of the output variables, the name appears in the Variable Name field and the Legend name field, which can be edited. The name displayed in this field can also be changed by selecting or de-selecting options for parameters within Name Composition.

Variable Name

Provides the user with the default name for the Output Variable within Simergy. This can be useful if the user has made substantial changes to the name, and they wanted to see what the default name originally was.

Legend Name

Allows the user to change the text representation of the legend name. For example, the user may want to shorten the name so that it fits better within the legend and the legends location on the graph.

Name Composition

Check Box Options

To allow the user the ability to differentiate between the output variable names for multiple results sets output variable names the four selections of area, alternative names, configuration name and run name are available for selection. By selecting the check box, such as "area" in the image above, the area name associated with that output variable is displayed after the output variable name shown in the field below Entity Display. Multiple selections can be made and the order in which they will be incorporated with the output variable name are in the order that they are shown. For example, "area" will always be

shown before "configuration name", if they both are selected, and "configuration name" will always be shown before "run name" when they both are selected. Each name composition selection that is chosen will be shown after a "/" that is included to show the user the break in the different parts of the output variable name that will be displayed on the legend.

Text

Font

The drop down list provides access to the different available fonts associated with the operating system. In addition the user can change the font size as well.

Formatting

Typical formatting capabilities are available including bold, italics, underline, font color, and alignment (left, center, right).

Decimal Places

Controls the number of decimal places that are displayed in the cells within the table associated with that output variable.