

INTRODUCTION

RDI has developed the Query Builder to meet a variety of different reporting needs in BaseCase. It allows you to create customized reports and export tabular data using query-writing software. The Query Builder is a menu-driven application that guides you through the details of building, managing, and executing queries.

With the Query Builder, you can create queries with full control over table and field selection, groupings, filter conditions, and sorting. Query results are then displayed in a grid, which can be viewed, filtered, sorted, graphed, exported to other file types, or printed as a report.

The Query Builder lets you save queries in a library file, and then restore them for reuse and editing. Also, the option to directly edit the SQL statement offers advanced users full control over the query-building process.

QUERY BUILDER BASICS

Creating a query through the Query Builder can be as simple as selecting a data set and some detail items. You can also create more advanced queries, however, using filters, sorting, and grouping. Users with a solid grasp of SQL can even edit the actual code for more specific querying needs.

Accessing The Query Builder

The Query Builder can be accessed three different ways:

- **Option 1:** from the Query Builder menu
The Query Builder menu offers two options to begin: New Query or Open Query. After a query has been created, the Save Query option will also become active.



- **Option 2:** from the main toolbar

The **Create New Query** button opens the Query Builder and starts the procedure to create a new query.



The **Open Query** button brings up the Open window, which allows you to locate and open saved queries.



The **Query Builder Shortcut** button allows you to access a specific data set from within a Profile. After accessing the Query Builder, you can either create a new query, or open a previously saved query.

- **Option 3:** from the Data Navigator



Most data sets in the Data Navigator have Query options.



Unlike Profiles, however, the Query Builder does not automatically filter on a single entity when launched from within the Entity Navigator – all filters must be specified on the Filters tab, or by using the Grid Tools after generating a data grid.

Creating a New Query

The following example is for a query that compares transmission tariffs for Oklahoma Gas & Electric and the Texas Municipal Power Pool.



1. Launch the Query Builder by clicking the **Create New Query** button on the main toolbar. The Query Builder window appears with the Data Sets tab active first.

In the top left corner of the Query Builder window, the Output Type drop-down list indicates how the data results will be formatted. The Output File field below it becomes active when the output type is a file.

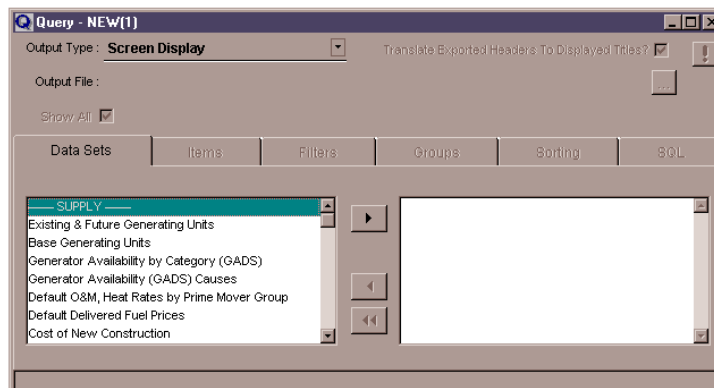


If you select a file format (as compared to using Screen Display) for the Output Type, the **Browse** button also becomes active. Clicking this button will launch a Save As window, allowing you to indicate the precise directory and file in which you would like to store the results of your query.

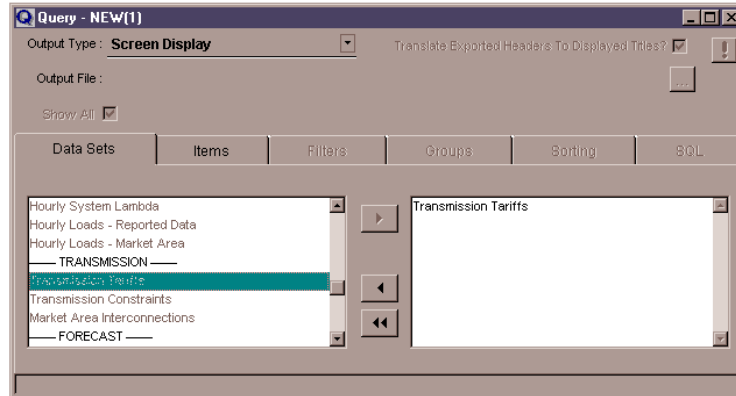
You can also click the Translate Exported Headers to Displayed Titles check box near the upper-right corner of this window to translate field names from the database file into more readable column headers in the exported file.

Keep in mind that the Output File, Browse button, and Translate Exported Headers options become active only if you select a file as the Output Type.

For this example, however, keep the Screen Display default.



2. Scroll down the available items list on the left side of the Data Sets tab, and then select Transmission Tariffs by double-clicking it. You can also highlight it, and then click the **Move Selected Items** button. The data set moves to the selected items list on the right.



NOTE: The Query Builder lets you choose multiple data sets for use in a query (as long as data sets that contain comparable data can be linked). After choosing the first data set, the data sets that remain active (not grayed out) are those that contain data that can be linked in a single query.

3. Move to the Items tab to select specific data items for this query. The Items tab lists all available data items for the Data Set that you select.
- a. Start by including all detail items (marked with an asterisk – “*”) in this query. This is done most easily by clicking the **Move Detail Items** button.



NOTE: While it is not a requirement, it is a good standard practice to include all detail items a query. This helps to provide the most unique information for each record that appears in a query’s results.



Notice that the **Show All** check box now becomes active on the left side of the Items and Filters tabs of the Query Builder window. With the Show All check box selected, all items available will be listed in the Items list, including all entity information and ID numbers.

When you deselect Show All, many fields are hidden that might be good to include in some queries, but are not essential to most. These hidden fields are ones that are not used regularly, such as state and country ID numbers.

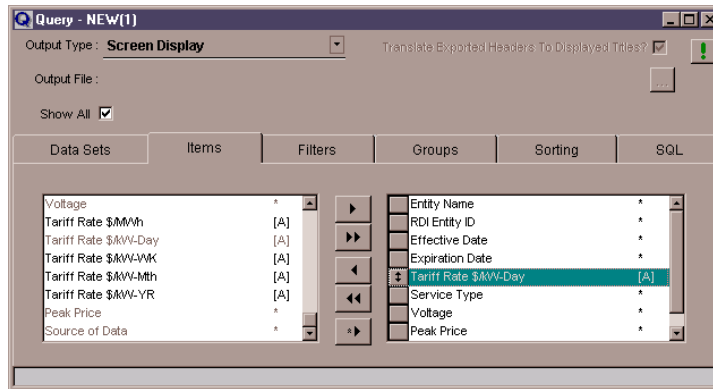
NOTE: The Show All check box will be selected by default the first time you open a query. After that, it will default to the way it was set in the last open query. If you deselect it in one query, and then open another new query, the Show All check box will remain deselected, even after closing and reopening BaseCase.



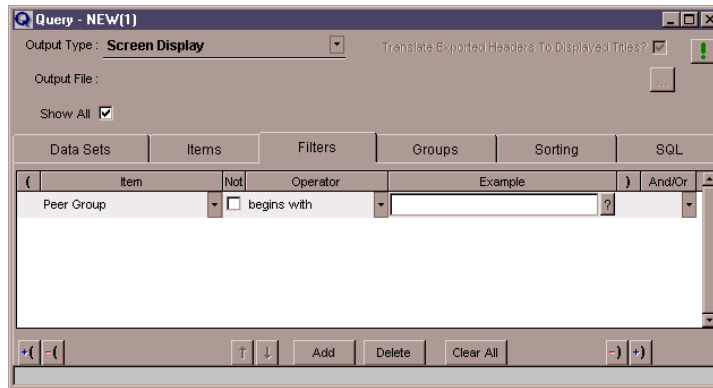
- b. Since this query will look at Transmission Tariff Rates, also include the Tariff Rate \$/KW-Day item. You can do this by either double-clicking it in the available items list, or by highlighting it and clicking the **Move Selected Items** button.
- c. The Query Builder translates the top-to-bottom ordering of the Selected Items list into a left-to-right ordering of columns on the results grid. Since this query is about tariff rates, that item should appear more prominently in the results.



Scroll down the Selected Items list until the Tariff Rate \$/KW-Day item is highlighted. Then click & hold the gray box next to it (a double-headed arrow will appear in the box), and drag it up the list until it sits between the Expiration Date and Service Type items.



- 4. Next, move to the Filters tab to create filters for this query.
 - a. Begin by clicking **Add** to add a new filter statement.



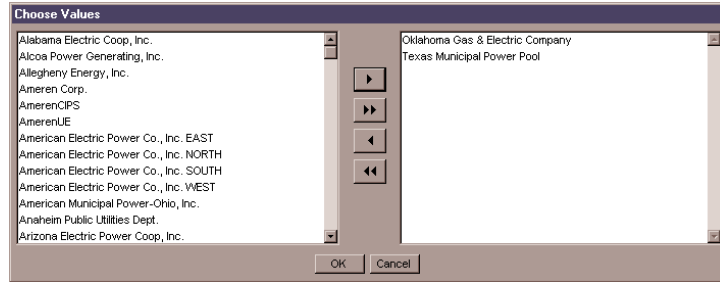
- b. In the Item column, select Entity Name.
- c. For this example, leave the Not check box deselected.

If you were to click this check box, however, then all items that do *not* meet the conditions of this filter will appear in the results of this query.

If, for example, you wanted to filter out non-zero monetary amounts from a query, add a filter with a monetary-amount item, click the Not check box, select the Exactly Equal To operator, and then enter 0 in the Example field.



- d. Move to the Operator column and select the in list operator.
- e. Click the ? button to the right of the Example panel, and then click the **Choose From List** button. The Choose Values window appears.
- f. On the Choose Values window, use the **Add Items** button to select the Oklahoma Gas & Electric Company and Texas Municipal Power Pool items.
- g. Your Choose Values window should look like this. Click **OK** to return to the Filters tab.



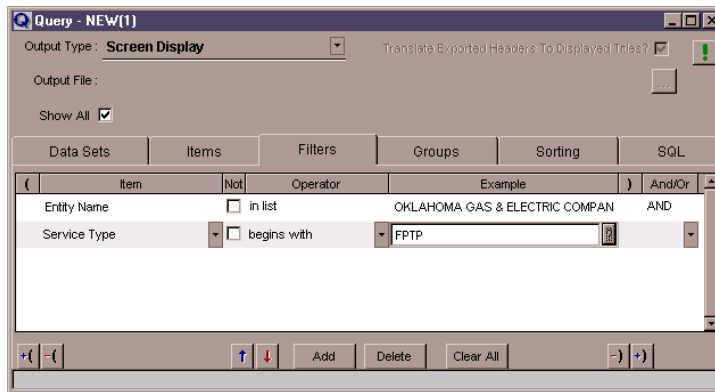
NOTE: When choosing Filter Operators, keep these guidelines in mind:

“begins with” is just that - the Example Item must begin with whatever you select or enter;

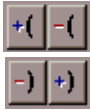
“like” requires a wild card (%) at the beginning or end of the statement;

“in list” can contain several Example items, each of which must be separated by a semicolon (;), not a comma.

- 5. Add a second filter to your query: Service Type begins with FPTP (Firm Point to Point). You can either type the Example, or use the Example Options window. Keep in mind, however, that what you type must exactly match the entry in the BaseCase database, or BaseCase will be unable to process the selection.



Notice that an AND appears at the end of each filter whenever you add a new filter. Including an AND here requires both this filter and the next one to be true in order to include a record in the Query results. To change the relationship between filters, click the And/Or column. If you choose the OR option, then either of the two filters can be true.



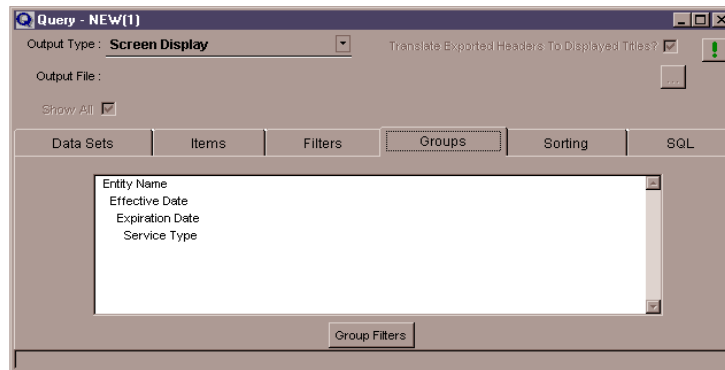
When using the OR condition, however, you must add parentheses to the filter. Parentheses are used to determine the order in which to evaluate filter statements. Statements enclosed in parentheses are evaluated first. To add or delete parentheses, click the **Add** or **Subtract Open Parenthesis** button or the **Add** or **Subtract Close Parenthesis** button with your cursor in the filter that you wish to enclose.

NOTE: To ensure your filter statement has a balanced number of parentheses, the Filter tab's header line shows the number of parentheses on each side of the filter equation.

6. The Groups tab lets you aggregate the data returned by this query, and then determine the manner for processing these data sets. This option is useful when the filter you create becomes so specific that no records are returned by the query.

On the Groups tab, the data-related items in your filter will be pre-selected, based upon your set items and filters. You can alter any of the pre-set groups (e.g., change the time period from daily to monthly evaluation in order to enrich the data set) in order to find the information you need. If you want to change the default, then click the **Group Filters** button at the bottom of this tab.

For this example, however, leave this tab unchanged and use the default setting.

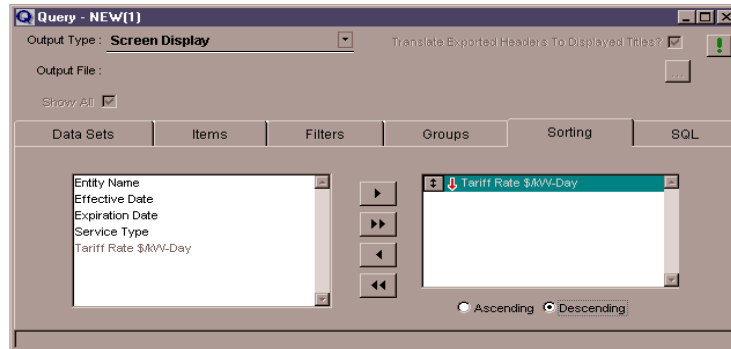


7. Move to the Sorting tab. The Sorting tab allows you to sort data items in ascending or descending order; BaseCase sorts items in the order of your list.

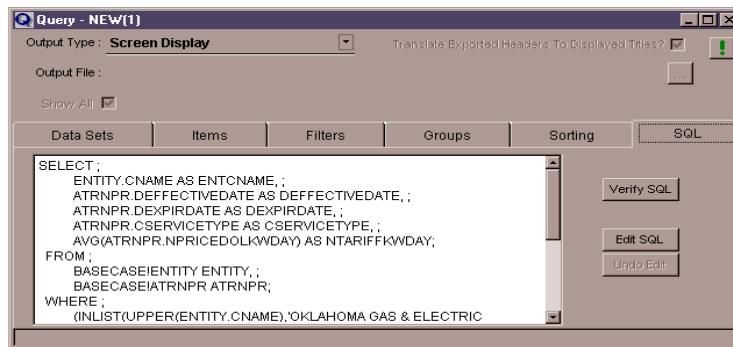
To set the sort order, highlight the data set in the right column and click either the Ascending (1 to 9, A to Z) or Descending (9 to 1, Z to A) option button at the bottom of the Sort tab. Data sets can be sorted independently in ascending or descending order.

- a. For this example, select the Tariff Rate \$/kW-Day item by double-clicking it in the available items list.

- b. Next set Tariff Rate \$/kW-Day to sort in descending order by clicking the Descending option button beneath the Selected Items list. This will cause records with the highest Tariff Rate \$/kW-Day values to appear at the top of the list. Note the red down arrow (for Descending sort order) next to the Sort item.



8. The SQL tab allows you to view and modify the SQL statement you created. Here advanced SQL users can edit their queries. If you want to edit this code, click **Edit SQL**. When finished with these edits, click **Verify SQL** to re-compile it. To discard your edits, click **Undo Edit**.



NOTE: RDI cannot support any queries that you edit. If you make any changes at all to a query from this window, and then wish to cancel those changes, click **Undo Edit**.



9. The query is complete. Click the **Process** button to execute the query and bring up a data results grid. Your grid should look similar to the one pictured below.

Entity Name	RDI Entity ID	Effective Date	Expiration Date	Tariff Rate \$/kW-Day	Service Type	
Oklahoma Gas & E	101419	07/08/1996	05/12/1997	0.0900	FFTP	AI
Oklahoma Gas & E	101419	05/13/1997	!!	0.0900	FFTP	AI
Texas Municipal P	815645	08/28/2001	!!	0.0755	FFTP	AI
Oklahoma Gas & E	101419	06/29/2000	!!	0.0521	FFTP	AI
Oklahoma Gas & E	101419	06/29/2000	!!	0.0366	FFTP	AI
Oklahoma Gas & E	101419	06/29/2000	!!	0.0000	FFTP	AI

6 records

You can use the Grid Tools to modify or print your results. Grid Tools are discussed in detail in Chapter 4, BaseCase Tools.

Saving and Re-opening Queries

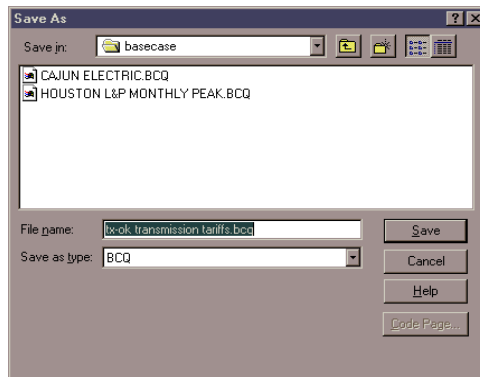
With continued use of BaseCase, you may notice the need to run the same queries on a continuing basis. Rather than rebuild them, you can save and reopen them for this continued use and re-use.

1. Close the query results data grid from the previous example and return to the Query Builder window.
2. Click the **Save Query** button on the main toolbar or choose Save Query from the Query Builder drop-down menu.



NOTE: To activate the **Save Query** button, you must be in the Query Builder (the window with the tabs), and not in the query results grid.

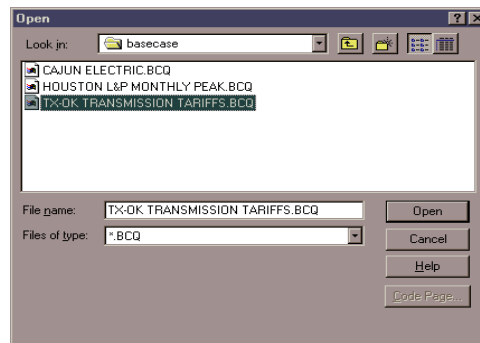
3. On the Save window, choose a location for your query file, name the query *TX-OK Transmission Tariffs (.bcq)*, and then click **Save**.



4. When you return to the Query Builder window, close it by clicking the **Close** button in the upper right corner.



5. To recall saved queries, click the **Open Query** button on the main toolbar, or select Open Query from the Query Builder menu.
6. The Open window will display your default query folder. If the *TX-OK Transmission Tariffs* query that you just created does not appear here, then navigate to where you saved it.
7. Highlight the *TX-OK Transmission Tariffs* query, and then click **Open**.



Reusing Query Elements

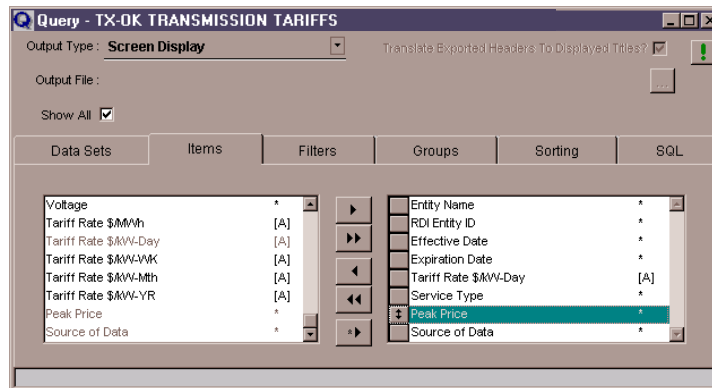
You can reuse elements of one query (such as Items, Filters, or Groups) in another query. At any point while you are creating a query, you can change the data in use.

From within the Query Builder, you may also remove or change the data sets in use. When a data set is removed from the selection list, all of the data items unique to that data set are removed from the query. Any items that are applicable to a remaining data set will remain in this query.

NOTE: Be careful when making any changes to the Data Sets tab, as it can radically change selections that you may have made throughout the rest of the query.

1. In the *TX-OK Transmission Tariffs* query window, move to the Items tab.
2. Remove the Voltage item by highlighting it, and then clicking the **Remove Selected Items** button. You can also remove items from a query by double-clicking it in the Selected Items list on the right.
3. The Items tab of the *TX-OK Transmission Tariffs* query should now look similar to the one pictured below.

From this point, you can either re-save this query, or save it to another query file. For this example, however, close the query without saving changes.



THE QUERY BUILDER AND GRAPHS

After generating a query, you can then graph the results. You can also modify the graph with a wide variety of graphing options.

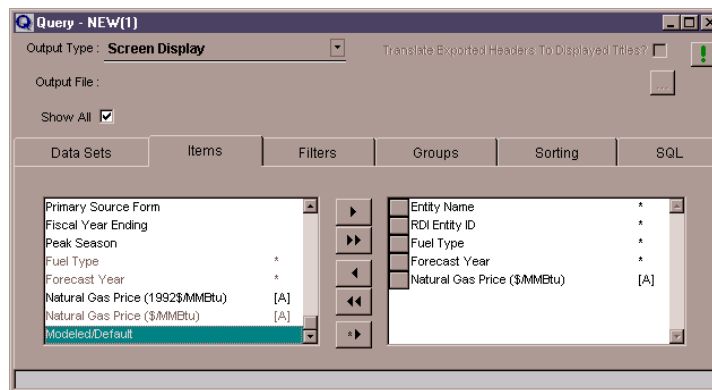
Creating the Query

The previous example had you create a query from scratch using the Query Builder. This example, however, will generate a query from the Data Navigator (with many items pre-selected for you).

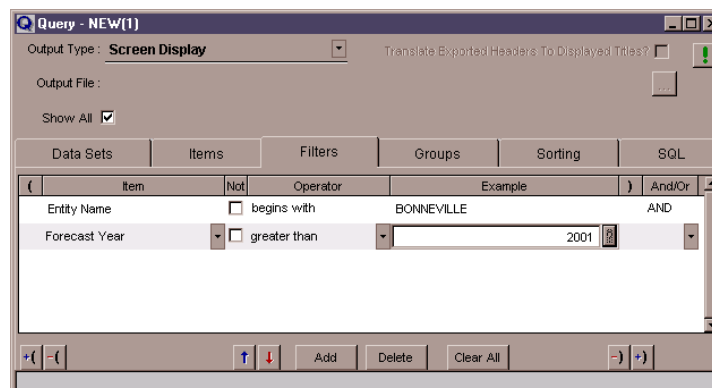
1. Close all windows from any previous examples.
2. Open the **Data Navigator** by clicking its launch button on the main toolbar.
3. Navigate to Forecast > Natural Gas Price Forecast by Market Area > Query. Since you launched the Query Builder from within the Data Navigator, the Query Builder appears with the Natural Gas Price Forecast by Market Area data set already selected for you.
4. Move to the Items tab and click the **Move Detail Items** button.



Also select the Natural Gas Price (\$/MMBtu) item by highlighting it and clicking the **Move Selected Items** button.



5. Move to the Filters tab and create the following filters:
 - Entity Name begins with Bonneville
(Be sure to actually type the word “Bonneville” in the Example field, rather than selecting it from the Choose Values window)
 - Forecast Year greater than 2001





6. Save this query to your default query folder by clicking the **Save Query** button on the main toolbar. Name it *Bonneville Nat Gas Price Forecasts 2002 - 2020*.



7. After the query has been saved, click the **Process** button to generate a data grid.

8. Expand the Entity Name column, and then scroll down the data grid. You will notice that there are several different geographic regions within the Bonneville Power Administration, and graphing the difference in prices between these regions is the next step in this example.

Entity Name	RDI Entity ID	Fuel Type	Forecast Year	Natural Gas Price
Bonneville Power Administration NORTHEAST	815782	GAS	2002	3.42
Bonneville Power Administration NORTHEAST	815782	GAS	2003	3.18
Bonneville Power Administration NORTHEAST	815782	GAS	2004	3.12
Bonneville Power Administration NORTHEAST	815782	GAS	2005	3.19
Bonneville Power Administration NORTHEAST	815782	GAS	2006	3.18
Bonneville Power Administration NORTHEAST	815782	GAS	2007	3.30
Bonneville Power Administration NORTHEAST	815782	GAS	2008	3.39
Bonneville Power Administration NORTHEAST	815782	GAS	2009	3.52
Bonneville Power Administration NORTHEAST	815782	GAS	2010	3.75
Bonneville Power Administration NORTHEAST	815782	GAS	2011	3.26
Bonneville Power Administration NORTHEAST	815782	GAS	2012	3.28

57 records

Building the Graph

BaseCase provides a variety of options for presenting data results as a graph. You can create different types of graphs, using different data items from your results, and then modify the graph to present it in an almost infinite number of formats.

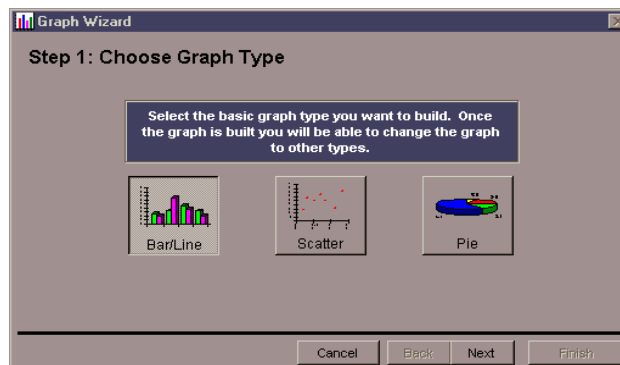
1. Keep all windows from the previous example open.



2. Click the **Display Graph** button on the main toolbar to launch the Graph Wizard.

3. The first step in the Graph Wizard is selecting a Graph Type.

For this example, select the **Bar/Line** graph type, and then click **Next** to continue.



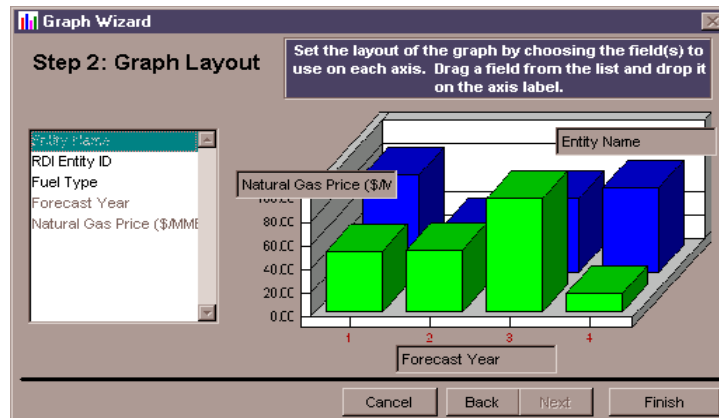
NOTE: The Graph Type that you choose here is only a starting point – you will have the option to change the graph format once the initial graph has been generated.

- The Graph Layout step of the Graph Wizard asks you to select Values, items, and Groups for this graph. This will determine the graph's X- and Y-axes.

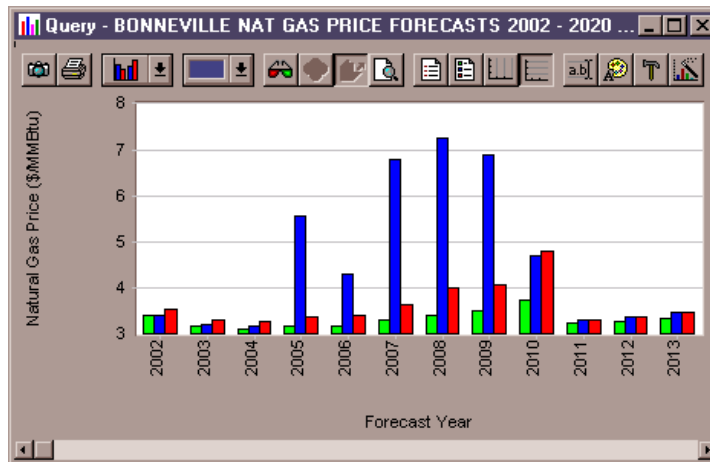
To define the X-axis, click and hold the Forecast Year in the available items list on the left, and then drag it to the *[Items]* field. Then define the Y-axis by dragging the Natural Gas Price (\$/MMBtu) to the *[Values]* field.

The *[Groups]* field defines the Z-axis. It is optional, but also very helpful when you need to group complex data results such as this one. For this example, drag the Entity Name item to the *[Groups]* field.

- Your Graph Wizard – Layout window should look like this. Click **Finish** to generate the graph.



- The Graph Wizard generates a graph from the data set you designed. The next part of this example will show you how to make further changes to this graph.



Advanced Graphing Techniques

The graph that BaseCase initially generates from data results may not appear in a format that you prefer. You can use the Graphing Toolbar on the Graph Results window to alter the appearance of your graph, print it, or copy it to the clipboard for use as a bitmap.



1. Since this is a large graph, click the **Maximize** button in the upper right corner of the window to view more of the graph without having to scroll as much.
2. The following is just a sampling of all the different things that you can do to alter the appearance of your graph (all of these buttons are on the Graphing toolbar in the current window):



- a. Click the **Switch Between 3d And 2d Views** button.

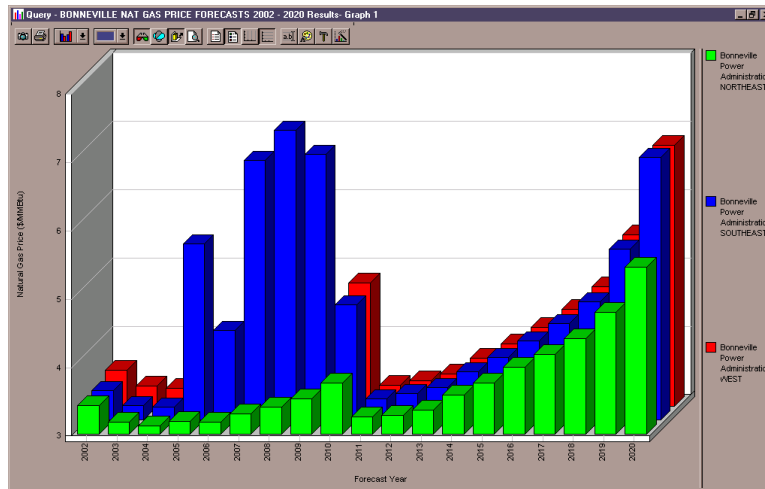


- b. If it is not already selected, then also click the **Z-clustered Series** button for a truly “three-dimensional” graph.



- c. Click the **Show or Hide Series Legend** button to help explain what the graph’s different colors represent.

At this point, your Graph Results window should look at least similar to the one pictured below.



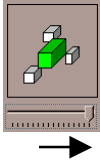
3. Now make the following additional changes to this graph (again, all buttons are on the current window’s Graphing toolbar):



- a. Click the **Edit Titles** button to call up the Titles window. Enter the following text in the Top field, and then click **OK**:
Bonneville Power Administration
Natural Gas Price Forecasts (by Region) – 2002-2020



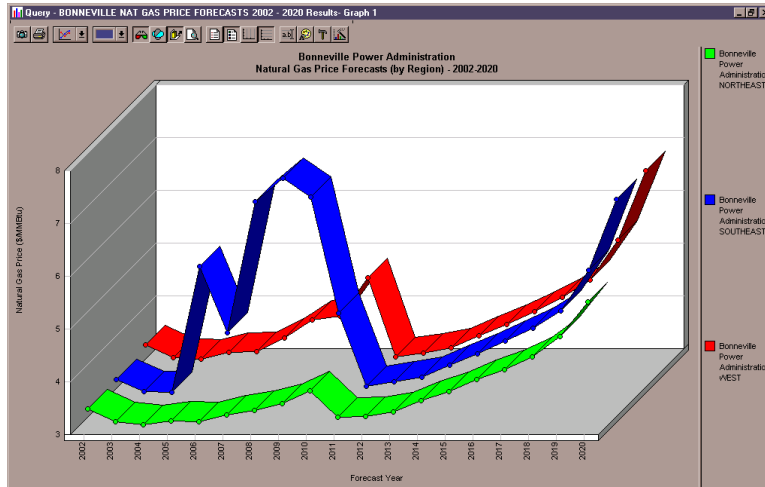
- b. Click the **Change Gallery Type** drop-down list. Change the Gallery Type from “Columns” to “Lines.”



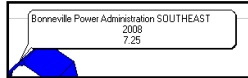
- c. Click the **Rotate the Chart** button to call up the 3D View Properties window.

Drag the slider in the upper right corner of the 3D View Properties window all the way to the right. This maximizes the “thickness” of the Z-axis.

4. Your graph should now look similar to this one.



5. Along with this graphical representation of data, you can also double-click specific data points to see their value.



For this example, double-click the point at the top of the blue line to see its value.

You can also double-click between data points to view the range of values between them.

6. Now that you have an idea of what you can do with graphing in BaseCase, spend some additional time with other options on the toolbar to see what else you can do with this graph. The **Rotate the Chart** and **Change Chart Properties** buttons, for example, each button launches pop-up windows with extensive graph-formatting capabilities.

More information on all buttons on the Graphing toolbar is available in Chapter 4, BaseCase Tools.

7. While you cannot save an actual graph within BaseCase, keep in mind that you have already saved the query that generated the data for this graph. You can, however, save an image of the graph for use in other applications.



Click the **Copy To The Clipboard As A Bitmap** button (on the Graphing toolbar in the Graph Results window).

8. Switch to a new document in MS Word, or a new spreadsheet in MS Excel (or any similar application) and select the Paste function.

There may be a few differences between this image and the original graph, but it will still paste into the other application. From there, you can use it as a bitmap graphic in that other application.

You can also paste the image into a graphic editing application, and then save it as a bitmap (.bmp) file.

NOTE: Graphs cannot be saved directly through BaseCase. Their images can be copied to the clipboard, however, and then saved through another application as a bitmap (.bmp) file. They are strictly images at this point, however, and cannot be edited any further within BaseCase.

The queries that originally generated the data to create these graphs can also be saved, re-used, and their data graphed again later.

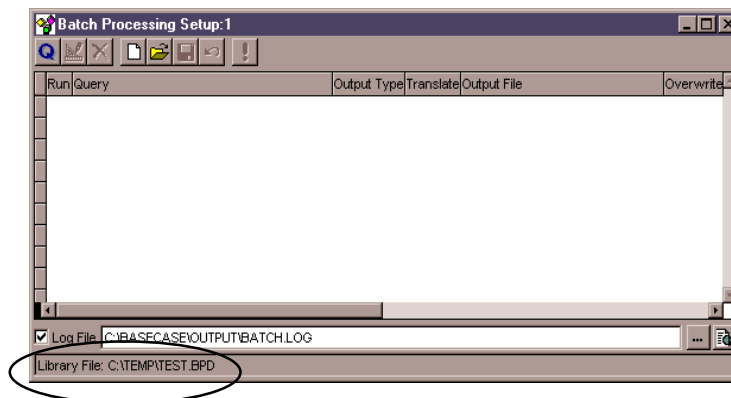
BATCH PROCESSING

The Batch Processing tool allows you to select and run multiple queries all at once. Batch Processing can be especially helpful when you have numerous or very large queries to run, possibly on a regular basis. You can also schedule batch processes to run while you are away from your computer, during a break, or even overnight.

Setting up a Batch Process

The following example demonstrates how to create a batch of queries, and then run them as a group.

1. Close all windows from any previous examples.
2. Click the **Batch Process Setup** button on the main toolbar. The Batch Processing Setup window will appear.
3. Click the **New Batch** button at the top of the Batch Processing window. When the Save As window appears, Name the batch file *Test (.bpd)*, and then click **Save**. You will see this file name listed as the current “Library File” at the bottom of the Batch processing Setup window.





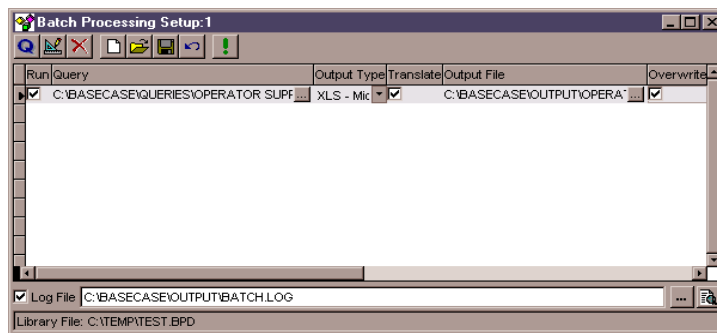
4. To insert an existing query into this batch, click the **Add Query** button at the top of the Batch Processing Setup window. A blank query line will appear in the window, and you will specify query files to include in this batch process.
 - a. Be sure to keep the Run check box at the left of this query line selected. You can keep future batch processes in this library file without having to run them by deselecting this check box.
 - b. Click the **Browse** button (at the right of the Query column) to call up an Open window for query files. Then select the *Operator Supply Curve* query that you created previously.
 - c. Click the Output Type drop-down list to select the type of file to create from this batch process. For this example, select XLS - Microsoft Excel Worksheet.
 - d. Be sure to also keep the Translate check box selected. This ensures that BaseCase exports recognizable column headings (instead of the actual data field names used in the database). If you deselect this check box, then the more cryptic database names will appear at the top of each column in the output file.
 - e. A default destination and name should already appear in the Output File field. BaseCase will make its default "Output" folder (as specified in User Preferences) the destination for this file. It will also give this file the same name as the Query file (*Operator Supply Curve* in this example), and use the extension that you selected in the Output Type field (.xls in this example).



You can also specify a different destination and name for this file by entering it in this field.

- f. If the Overwrite check box is not already checked, then click it to have this batch process overwrite any previous copies of this output file.

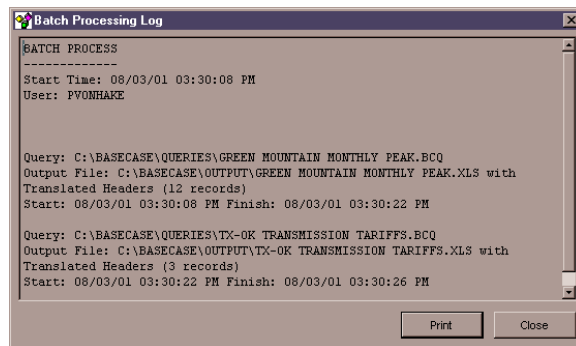
Your Batch Processing Setup window should look similar to the one pictured here.



NOTE: Normally, you would add several queries to a batch. But this example only needs one query in order to demonstrate batch processing.



- When you are ready to start the batch process, click the **Run Batch** button at the top of the window. BaseCase will show its progress, and then display a Batch Processing Log window with the results of this batch process.



Setting the Time and Day for Batch Processing

The Start Batch Process button on the main toolbar allows you to choose a batch process that you have already created, and then set the time and date for that batch to run.



- Click the **Start Batch Process** button on the main toolbar. The Start batch Process window appears.



- Click the **Add Batch** button to launch the Open Batch File window.
- Select the *Test* batch that you just created.
- Notice that the **Start Time** panel (in the upper right corner of this window) includes a 24-hour clock that shows the current date and time.

In the example below, the *Test* batch process is set to begin processing at 11:00 PM on October 1, 2001.



For this example, set the test batch to run just a minute or two from now:

- a. Click the **Up Arrow** next to the Minutes field twice. This sets the Start Time for this batch process to just under two minutes from now.
- b. All buttons on this window – except for the Stop button – become inactive. The window will remain this way until the Batch Process is completed.



If you want to cancel this batch, then click the **Stop** button at any time before the designated Start Time.



For this example, however, click the **Start** button to accept this information, and then wait a minute or two for this batch to process to run.

BaseCase will automatically begin processing this batch as of the Start Time. When the batch is completed, a Batch Processing Log window will display its results.

NOTE: The BaseCase application must be available when the batch process is scheduled to run. When a future time and date for the run is entered, the Start Batch Process window remains open and you cannot exit BaseCase. After the run is completed, you can exit the application.
