MassEnergyInsight User Guide

Buildings

Vehicles

Traffic Lights and Streetlights

Drinking Water & Wastewater Treatment and Pumping

Summary

MassEnergyInsight is an innovative software tool designed to help Massachusetts municipalities analyze their energy use. This user guide walks through the features of this tool in four steps. After reading this guide, any MassEnergyInsight user should be able to analyze his/her municipality's energy performance. The types of analysis facilitated by MassEnergyInsight enable users to make appropriate decisions regarding where to best spend the resources available to maximize both financial and environmental gains.

Acknowledgements

The Massachusetts Department of Energy Resources (DOER) would like to acknowledge several important contributors to this document. First, thanks must be given to the city of Worcester and its interns from Worcester Polytechnic Institute, whose idea it was to create this guide and who wrote an initial draft. Second, DOER would like to thank Allen Camara, a DOER intern from Mt. Wachusett Community College, who also contributed significantly to this guide. Finally, DOER would like to acknowledge our partners at the Peregrine Energy Group, who designed and operate MassEnergyInsight and whose efforts have provided Massachusetts' governmental entities with outstanding tool to track and manage their energy usage.

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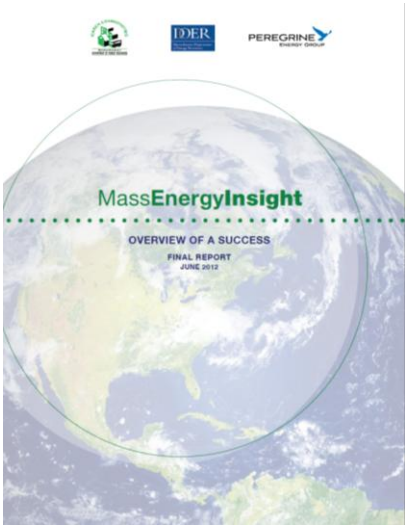
Purpose

The purpose of this document is to provide new users of MassEnergyInsight with an overview of this municipal energy management tool. It also provides information about MassEnergyInsight for people who don't have access to the system but are interested in learning more about it. By providing a printable overview, this guide is meant to complement – not supplant - the more detailed and comprehensive support information available online through MassEnergyInsight, such as on-demand training videos and frequently asked questions (FAQs).

What Is MassEnergyInsight Used For?

MassEnergyInsight enables energy tracking by assigning energy use to **user-created facilities and departments**. All types of municipal energy usage, such as by buildings, vehicles, water/sewer facilities, streetlights and open spaces, can be included, as can all fuel types (electricity, natural gas, oil, propane, gasoline, diesel, renewable energy). MassEnergyInsight can help towns, cities, and school districts to best decide how to allocate their limited resources to pursue energy efficiency, thereby saving taxpayer money. For examples of how municipalities are using MassEnergyInsight, see the *MassEnergyInsight: Overview of A Success* report available on DOER's website.



Who Is Using MassEnergyInsight?

MassEnergyInsight offers all Massachusetts local and regional governmental entities - including municipalities, school districts, and water and wastewater districts - a new interactive way to analyze their energy use. As of June, 2012, more than 700 people were authorized to use MassEnergyInsight in over 220 public entities, as illustrated in the map below.

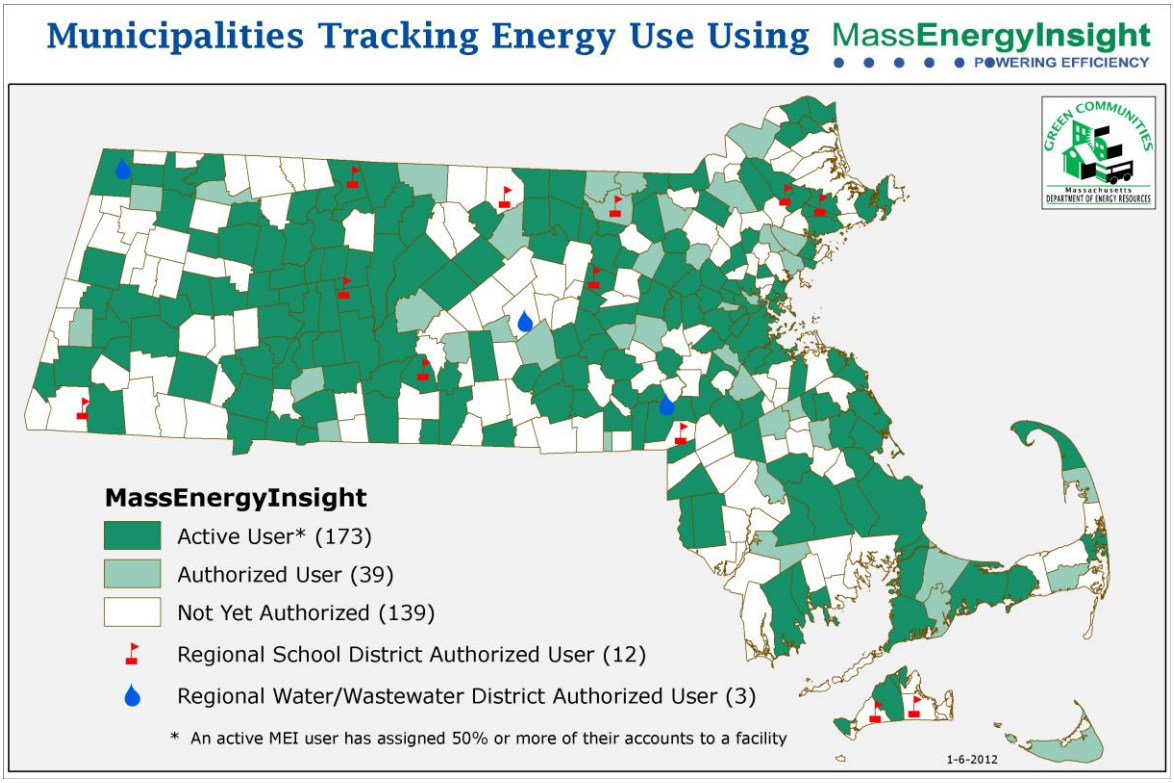


Figure 1: Home page location of Getting Started resources

There are tips and tricks to get the most out of this valuable software. This document will walk new users through the four basic steps needed to get up and running.

Step 1: Training & Resources

The first step to using MassEnergyInsight is to understand the training resources provided to you. Located on your home page, the Getting Started webinar covers the basics of MassEnergyInsight, walking users through the displayable energy use reports, as well as the process of adding new facilities and assigning them their energy billing accounts *(Arrow 1 in Figure 2)*. Additional, on-demand videos range in length from two to six minutes and deal with very specific topics. These are available in the support section *(Arrow 2 in Figure 2* and *Figure 3)*.

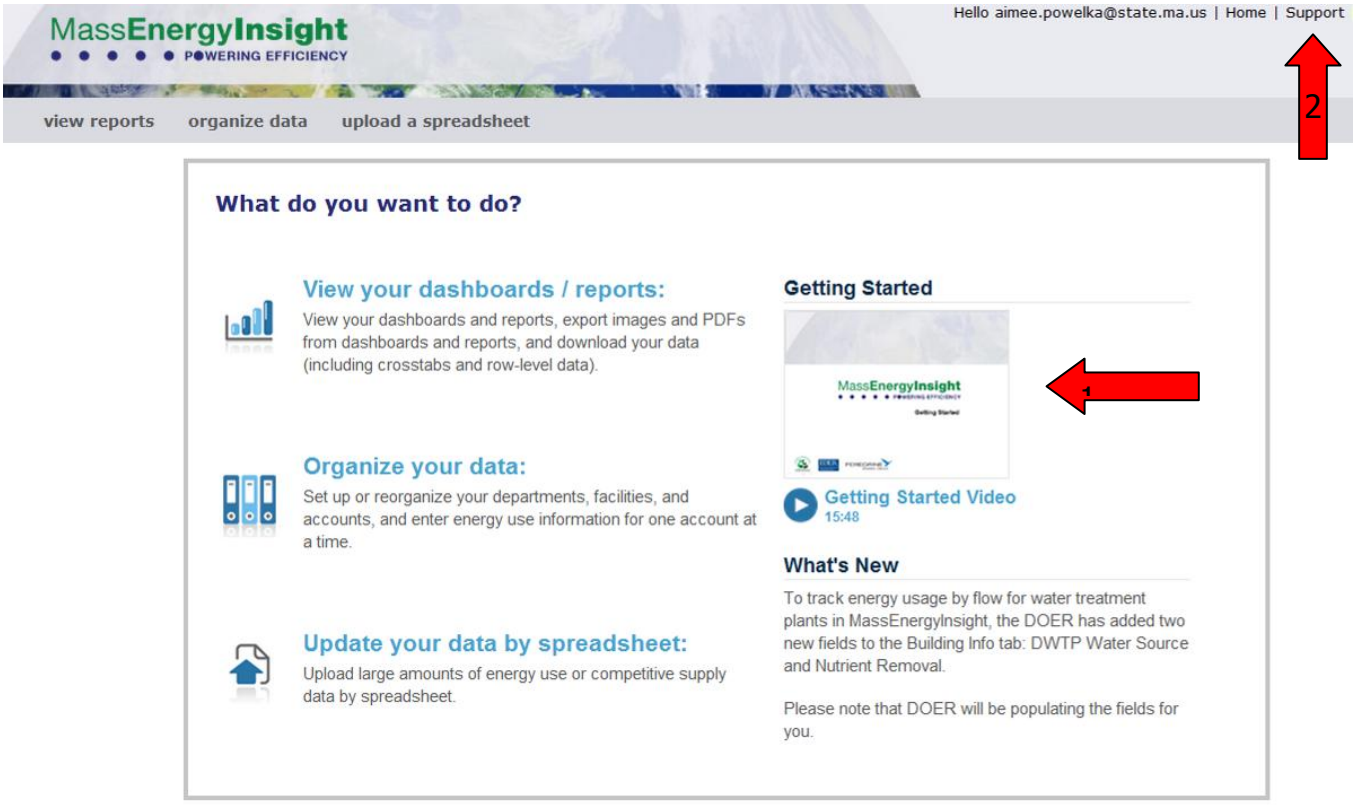


Figure 2: Home page location of Getting Started resources

The Support Page (*Figure 3*) includes the training videos, an FAQ section, a glossary, and a way to contact support personnel. The *FAQ* contains specific MassEnergyInsight information such as fuel grades and emission factors, as well as standard user issues such as lost passwords and understanding the system and reports. The *Glossary* contains definitions for categories and sub-categories. *Contact Support* allows you to request additional help. This is a very important resource for new users who have questions regarding any aspect of MassEnergyInsight. By using these resources, new users should have a fairly clear grasp of the functionality of MassEnergyInsight, even before using it.

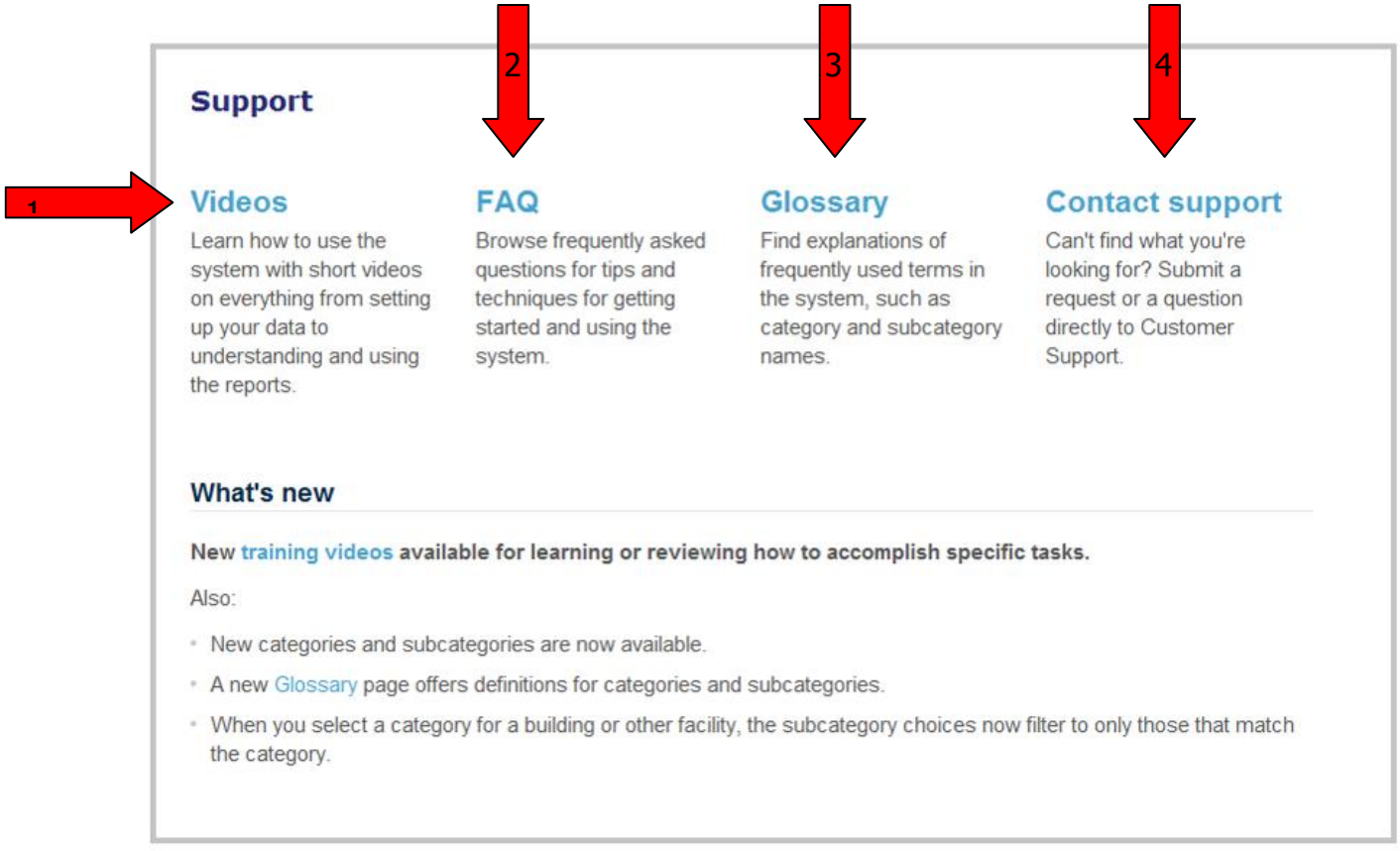


Figure 3: View of the technical support page

Step 2: Preparing the Data

The second step to using MassEnergyInsight is to prepare the data for analysis. The primary goal of this step is to ensure the completeness and reliability of the underlying data. For MassEnergyInsight, this means that each facility has the proper information (such as square footage) entered correctly, the correct accounts have been assigned, and that these accounts have usage data loaded.

To begin preparing the data, log into MassEnergyInsight and click on "*Organize your data*" (*Figure 4*). From there, the user is brought to MassEnergyInsight's Organize Data view. To add a new department or facility/building, click "*create new*" and fill out the appropriate fields. In order to get the most out of MassEnergyInsight, be sure to assign values to the *category, sub-category*, and *square footage* fields. To see definitions of the *category* and *sub-category*, see the Support section's Glossary. MassEnergyInsight's reports utilize these fields regularly, so the reliability of this information is particularly important.

Figure 4: Beginning of data preparation

Next, assign the appropriate account(s) to the facility. This is accomplished by clicking the "*accounts*" button (located next to the "*create new*" button). This pulls up the entire list of accounts that were initially imported into MassEnergyInsight (*Figure 5*). Clicking on the account number will bring the user to a page where account information can be entered and the account assigned to a particular facility (*Figure 5*). A drag and drop technique may also be used, as described in the *"Reassign or Move an Account in the Tree"* training video in the Support section.

A user should associate all of his/her energy accounts with their specific corresponding facilities. Additionally, any accounts that MassEnergyInsight automatically links with facilities should be *checked for accuracy*. Finally, if the town is interested in seeing competitive supply costs that aren't being billed by the investor owned utility, competitive supply accounts should be created and linked to the corresponding electric or gas account in order to ensure that the cost information contained in MassEnergyInsight is as accurate as possible.

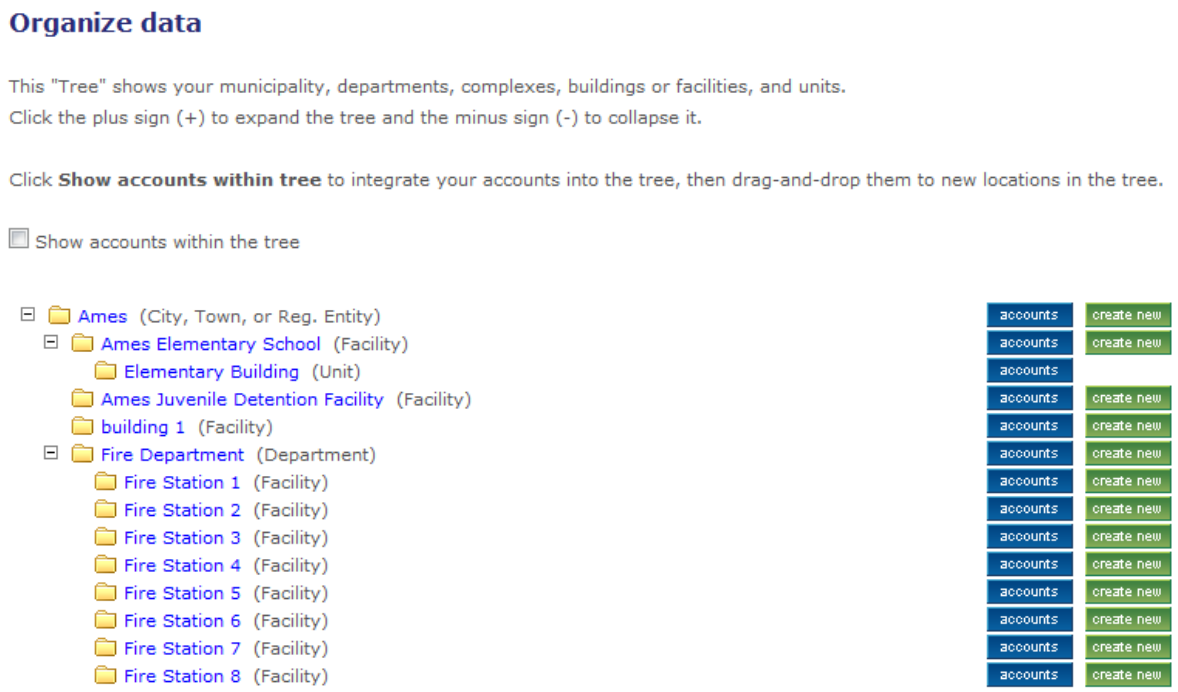


Figure 5: MassEnergyInsight's Data Tree

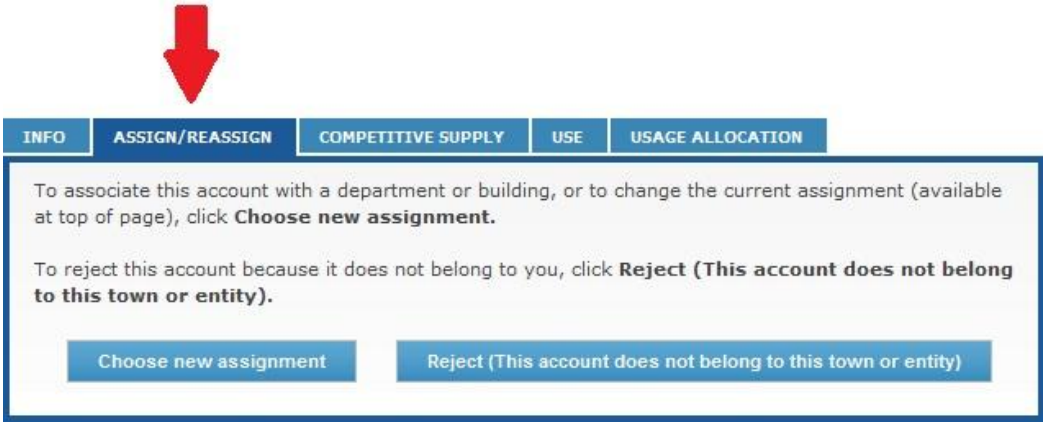


Figure 6: Assigning Accounts

It is also recommended that *special effort be made to enter the square footage for all facilities*, since some of the efficiency calculations done in MassEnergyInsight are based on square footage. Errors in square footage data will cause incorrect numbers for energy use intensity, a measure of energy use per square foot.

Since only "facilities" can be assigned a category and subcategory, it is sometimes useful to create a placeholder "facility." For example, many municipalities have found it useful to create a streetlights "facility" to include all of their streetlights accounts together and assign the category of streetlights. For more information on how to do this, see the training video "*Streetlights and Vehicles*" in the Support section.

To ensure that setup is complete, the "*Setup Completeness Dashboard*" is very useful. It highlights any facilities that have not been assigned a *category, sub-category,* or *square footage* (*Figure 7*). The dashboard also reveals any accounts that have been imported but have not been assigned to a facility. This report is useful in bringing attention to any mistakes the user might have made when creating the facilities.

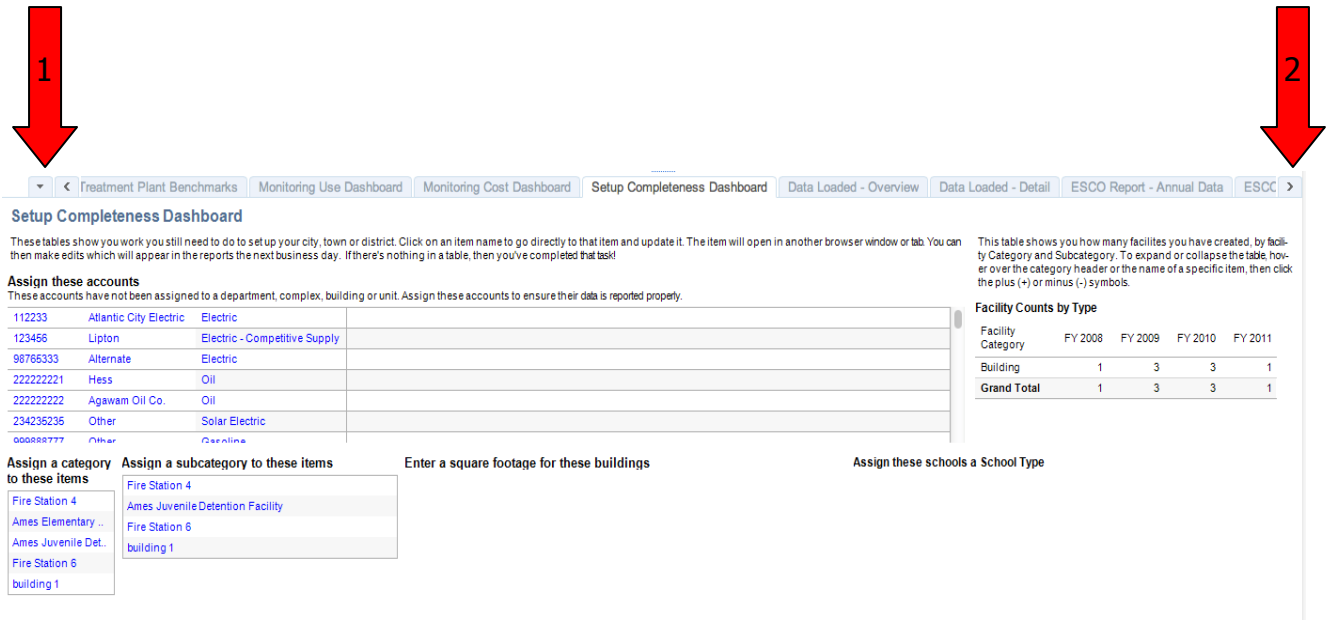


Figure 7: Setup Completeness Dashboard

To view the "*Setup Completeness Dashboard*" and other reports, the user needs to navigate to the "*View Reports*" section (*Figure 8*) and use the pull-down menu at the far left (1) or the side scrolling arrows (2) to reach the desired report.

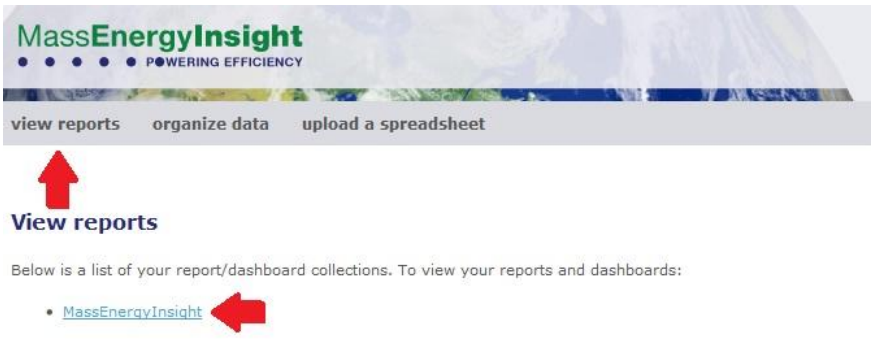


Figure 8: Viewing Reports in MassEnergyInsight

Step 3: Loading Data and Verifying Data Completeness

The third step to using MassEnergyInsight is to ensure that data is loaded into all accounts. Data enters MassEnergyInsight in two different ways. Data for some accounts, including utility-provided electric and gas usage and cost are "automatically" updated by Peregrine Energy Group without any effort on the user's part. [1]

Other data – including competitive supply cost; oil, propane, gasoline, and diesel usage and cost; and renewable energy generation - must be loaded by the user either manually or via a spreadsheet upload process. To upload these data, the user must gather the account number, delivery date, fuel grade, amount of fuel delivered and the cost. Since this must be done for each account number and delivery date, a spreadsheet greatly simplifies the process. To learn how to upload a spreadsheet, see the "*Uploading a Spreadsheet*" video in the Support section.

Once every facility has been created, all accounts have been assigned, and user-provided data has been uploaded, the third and arguably most crucial step is ensuring *all* the data for those accounts have been loaded. This is accomplished by viewing the "*Data Loaded – Overview*" reports.

Users will find the "*Data Loaded – Overview*" report useful in ensuring the completeness of the underlying data (*Figure 9*). It addresses, in a tabular format, which accounts are missing data for which months. Any month that has a white space indicates that there is no data loaded for that month. This may indicate missing data, or it may indicate that two reads occurred in the previous or subsequent month. If the user determines that

[1] Section 7 of Chapter 25A of Massachusetts General Law enables DOER to request energy usage and cost information from the investor-owned electric and gas utilities. This is the data that is loaded into MassEnergyInsight by Peregrine and includes Cape Light Compact, NStar, National Grid, Unitil, Berkshire Gas, Blackstone Gas, Columbia Gas and New England Gas. Additionally, several municipal light plants currently provide data for loading into MassEnergyInsight. If you wish your municipal light plant to provide data, please contact Peregrine Energy Group at 617-367-0777.

data is actually missing, the *user* has three options: (1) contact Peregrine through the Support section if this is an electric or gas account loaded by Peregrine, (2) locate and enter the data manually using the account's *use* tab in the organize data section or by uploading a spreadsheet, or if the data cannot be located, (3) add a note to key reports regarding how much is missing.

Green cells indicate that the data for that account have loaded for the indicated month. It is important for analysis to verify that all of the utility data for the year under review has *been loaded, without any missing months.*

For accounts that use competitive supply, the data loaded from the electric and gas utilities will not have the total cost, although the usage will be correct. For the cost information to be accurate, users must load the competitive supply cost into the corresponding competitive supply accounts on MassEnergyInsight themselves. The "*Data Loaded – Overview*" report includes the competitive supply accounts separately to assist you with tracking whether the competitive supply data have been loaded.

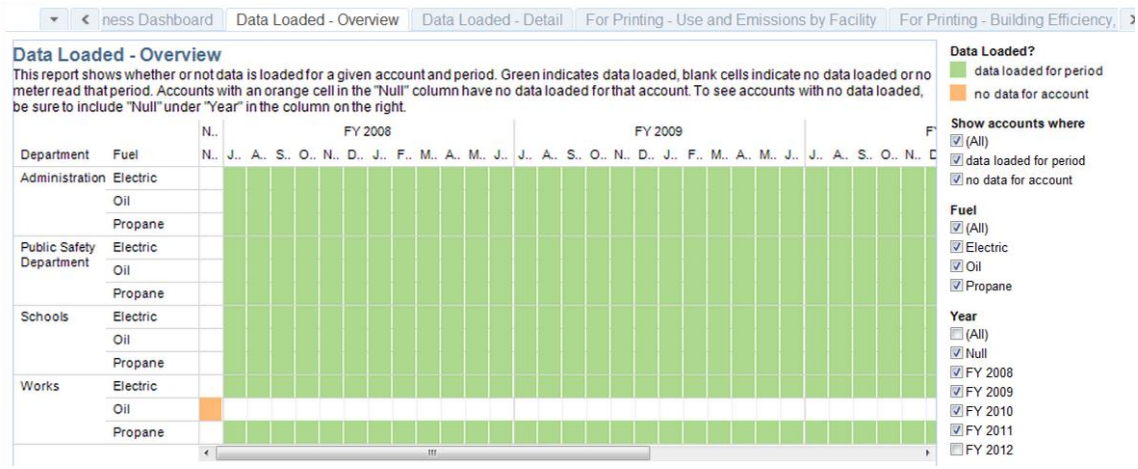


Figure 9: Data Loaded – Overview Report

By this point, the user should have data that are both reliable and valid, meaning they can proceed to the next stage.

Step 4: Analyzing your Energy Use Data

The final step in using MassEnergyInsight is to use and understand the reports. A general process for analyzing the data can be followed using the reports listed below. By viewing the reports *in this order*, the user can gain a general understanding of his/her municipal energy use in a top-down manner, beginning with the general energy use for the municipality and ending with a specific energy usage for individual facilities.

- Baseline Dashboard
- Usage Trends – City/Town
- Buildings to Target
- School Benchmarks
- Building Dashboard

The most useful report giving the user a "big picture" of energy use is the "*Baseline Dashboard*" (*Figure 10*). The overall percent change in energy usage from the baseline year at the upper left is a very useful graph. It tells whether the energy use is increasing, decreasing, or remaining constant. Establishing a baseline year is an important step for analysis and should be done from this report. Start by selecting all the years available in the "Baseline Dashboard," then remove any years that have a significant portion of missing data and are noticeably lower than the most complete year. Alternatively, if a baseline year has been established during the process of applying for Green Community designation, uncheck any years previous to that baseline year. A good baseline year will be the start of a consistent trend of energy usage data.

Next, the breakdown of use by facility category will enable the user to understand how their municipal energy is apportioned among buildings, open spaces, water/sewer facilities, and street and traffic lights and vehicles (*Figure 10A*). For most municipalities, the primary consumer of energy is the Buildings category.

Finally, the data may be viewed by department by selecting the department filter (*Figure 10B*). This view is useful for facilitating discussions among department heads regarding the energy costs and use by their facilities.

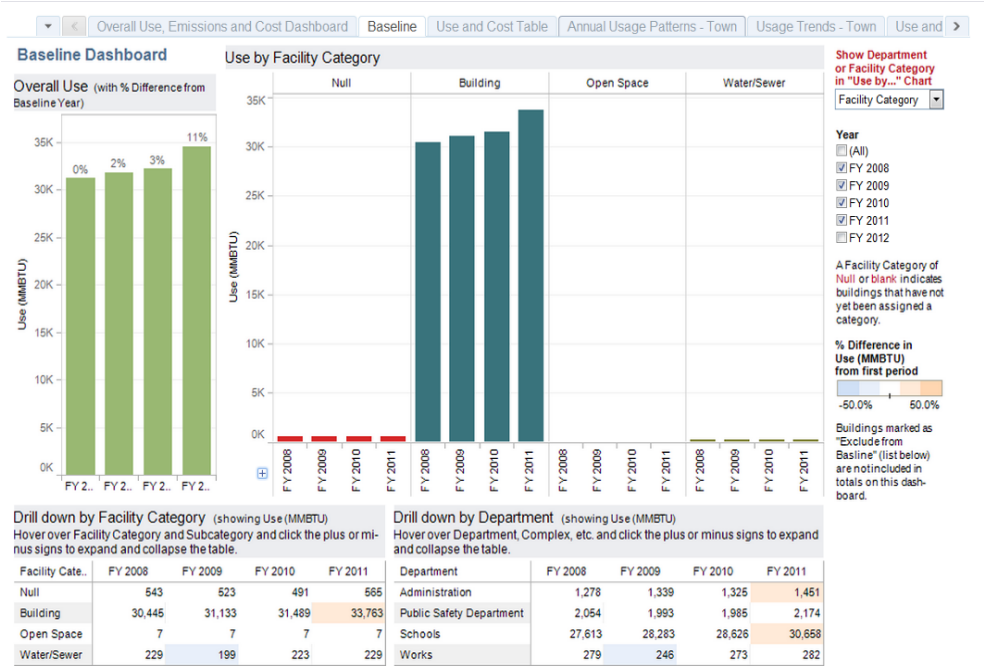


Figure 10A: Baseline report with facility category filter

Figure 10B: Baseline report with department filter

Energy Use Trends

The next graph to view is "*Usage Trends – Town*" (*Figure 11*). This report drills down further into a municipality's energy use and provides general trends for all major energy types. This report provides a good opportunity to see if the chosen baseline year is appropriate. An appropriate baseline year is one that enables trends of energy usage to be seen over the subsequent years.

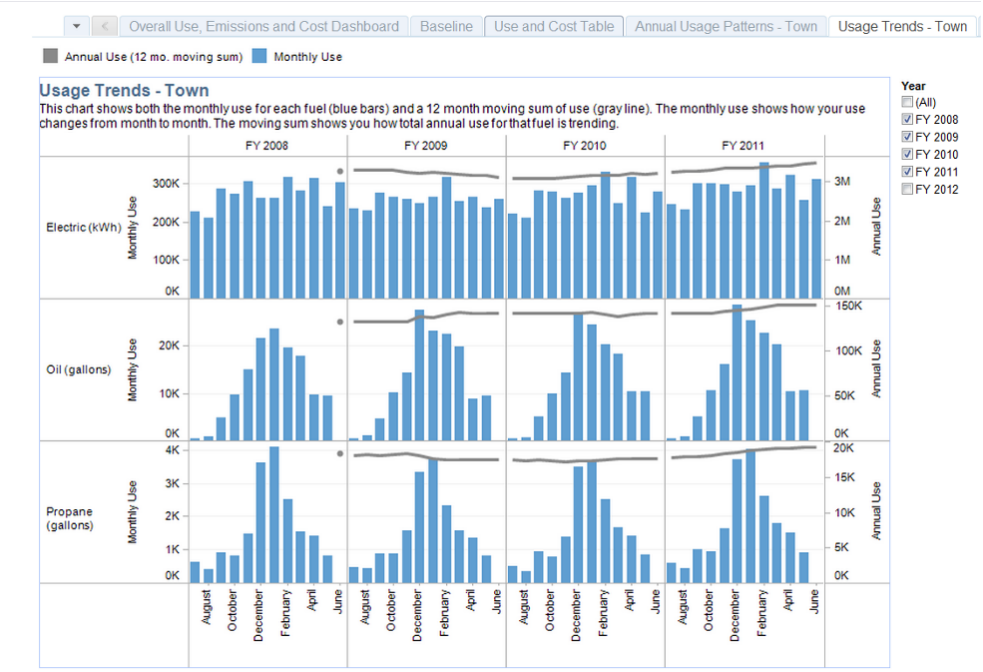


Figure 11: Usage Trends Report

Additionally, the *"Use and Cost This Year to Last" (Figure 12)* graph shows current energy use and cost overall or for an individual fuel type, from the latest complete data set, compared to energy use and cost from the same time in the previous year.

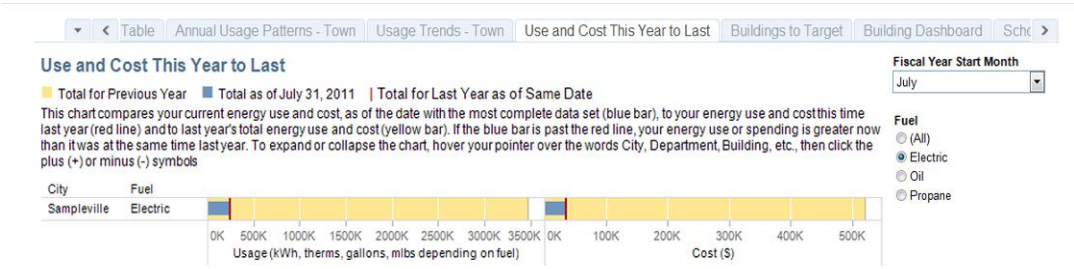


Figure 12: Use and Cost this Year to Last

Analyzing Building Energy Consumption

The next logical step would be to look at building efficiency, since buildings (facilities) are often the primary contributors to energy consumption. MassEnergyInsight calculates building efficiency using energy per area (measured as kBTU per square foot). What this means is a more efficient facility will have a lower value than a less efficient facility because it consumes less energy per square foot.

Several reports display facility information. From the "*Buildings to Target*" (*Figure 13*) report, it's easy to identify which facilities use the most energy and how they rank in terms of efficiency against the rest of an entity's facilities. The chart titled "*Efficiency and Use,"* which is divided into four quadrants, is a good preliminary indicator of which facilities need additional analysis. The upper right quadrant is the key, since facilities in this quadrant are both the least efficient facilities (in kBtu/sf) and the highest energy consumers (in MMBtu).

Figure 13: Buildings to Target Report

Analyzing School Benchmarks

MassEnergyInsight has an excellent "*School Benchmark*" report (*Figure 14*), that allows users to compare the efficiency of their schools with others throughout Massachusetts.

The user has the option to select different years, as well as to filter results by type of school analyzed. More efficient schools are to the right, while less efficient schools are on the left. While this graph is an excellent tool, the type of school will significantly change its energy consumption habits.

For instance, a high school, which presumably has significantly more computers and high energy consumption devices than an elementary school, will consume more than an elementary school per square foot. In order to compare a particular school to its peers, the user can select the school type, such as a high school or elementary school.

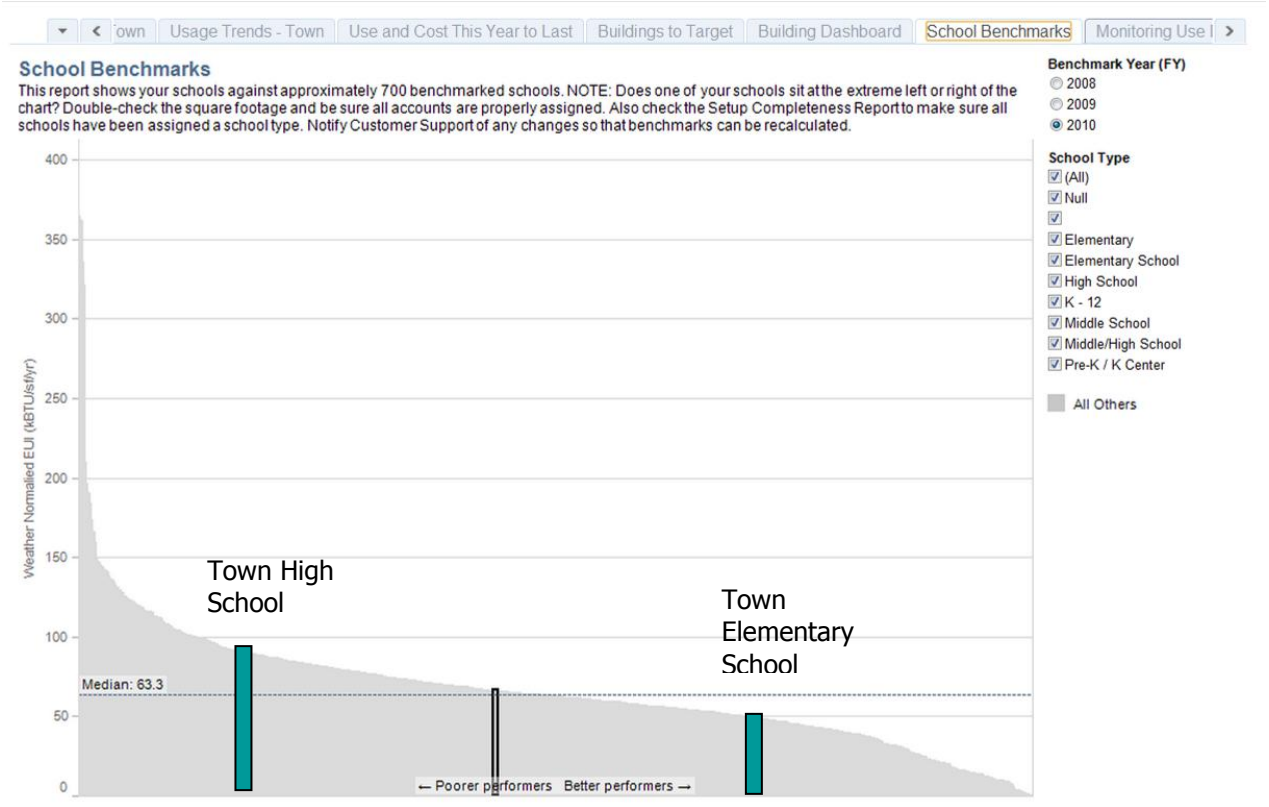


Figure 14: School Benchmark Report

Analyzing Building Energy Use and Costs

The final step in the top-down analysis approach is to look at each facility identified by either the "*Buildings to Target*" report or "*School Benchmark*" report in detail. This is accomplished using the "*Building Dashboard*" (*Figure 15*), which lets the user examine the detailed energy consumption patterns and costs for a specific facility. With this report, the user can identify if a facility has had unusual energy usage that should be investigated further, as well as how much each fuel type contributes to the overall energy consumption.

The "*Usage Trends"* graph shows facility fuel use by month as blue bars, as well as a 12-month rolling sum of use as a line. The "*Cost Trends"* graph shows facility fuel costs by month as green bars, in addition to the 12-month rolling sum of cost, shown as a line. The "*Annual Usage Patterns"* chart shows the energy use for multiple years on the same chart, highlighting normal versus abnormal patterns of usage across a year.

Figure 15: Building Dashboard Report

Step 5: Exporting the Data (Optional)

For users wishing to perform advanced analysis on the underlying data, the data can be exported from any report:

- First, navigate to the graph for which you would like to view the data and select all the relevant years. The "*Overall, Use, Emissions, and Cost Dashboard*" is shown as an example in *Figure 16A*.
- Select the "Use, Emissions and Cost by Item Level" graph by clicking on it
- Hover over the leftmost icon (Export menu) in the toolbar at the top center of the page, then click on "Data" in the dropdown menu (*Arrow in Figure 16A*). A new window will immediately open containing a select portion of the data for view, split into two tabs: *Summary* and *Underlying*. The *Summary* data exported from *Figure 16A* is shown below in *Figure 16B* for illustration.

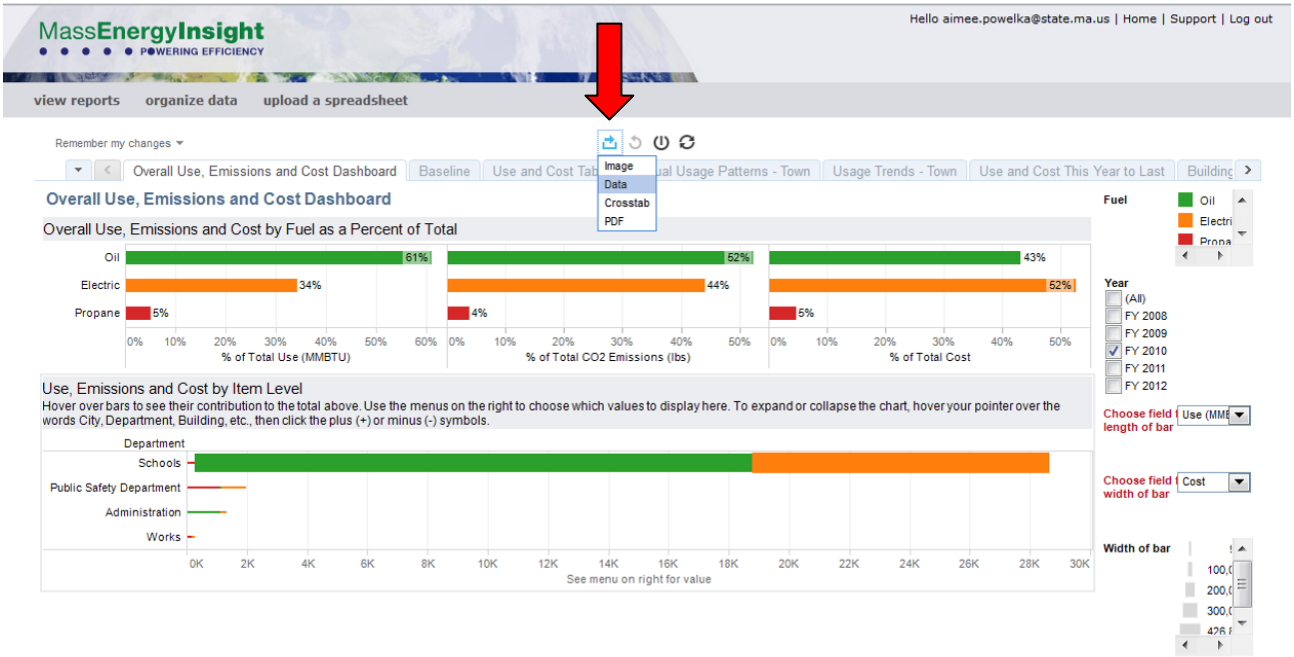


Figure 16A: Step 1 in exporting the underlying data

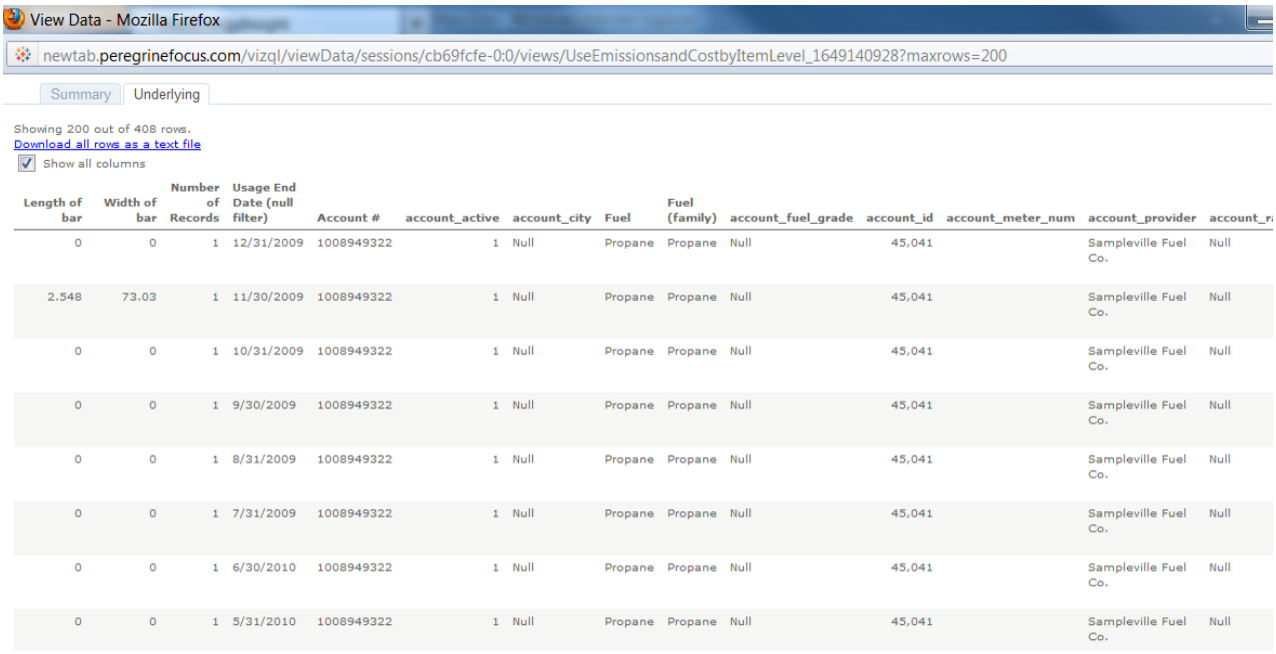
Summary

Fuel (family)	Department	Length of bar	Width of bar
Oil	Administration	1,078.50	19,707.75
Electric	Administration	201.578	9,448.13
Propane	Works	184.184	4,532.03
Oil	Public Safety Department	60.187	953.28
Propane	Administration	45.318	1,327.91
Propane	Public Safety Department	1,094.46	27,901.38
Oil	Schools	18,504.51	370,120.62
Propane	Schools	280.28	7,180.98
Electric	Works	88.52	6,503.38
Electric	Public Safety Department	830.344	32,280.08
Electric	Schools	9,841.67	426,886.66

Figure 16B: Step 2 in Exporting the Underlying Data

Underlying

The summary data tab contains just the data points presented in the chart or table. In order to gain access to all of the data used to create the chart or table, the user must click on "*Underlying,*" check the box labeled "*show all columns,*" and then click "*Download all rows as a text file*" as shown in *Figure 17A*. A "comma separated value" (.csv file) will be downloaded and should be opened and saved in Excel. The data can then be manipulated at will. For larger datasets, this csv file can be quite large, often several megabytes. A sample of the data from the csv file is included below *Figure 17B*.



Length of bar	Width of bar	Number of Records	Usage End Date (null filter)	Account #	account_active	account_city	Fuel	Fuel (family)	account_fuel_grade	account_id	account_meter_num	account_provider	account_r
0	0	1	12/31/2009	1008949322	1	Null	Propane	Propane	Null	45,041		Sampleville Fuel Co.	Null
2.548	73.03	1	11/30/2009	1008949322	1	Null	Propane	Propane	Null	45,041		Sampleville Fuel Co.	Null
0	0	1	10/31/2009	1008949322	1	Null	Propane	Propane	Null	45,041		Sampleville Fuel Co.	Null
0	0	1	9/30/2009	1008949322	1	Null	Propane	Propane	Null	45,041		Sampleville Fuel Co.	Null
0	0	1	8/31/2009	1008949322	1	Null	Propane	Propane	Null	45,041		Sampleville Fuel Co.	Null
0	0	1	7/31/2009	1008949322	1	Null	Propane	Propane	Null	45,041		Sampleville Fuel Co.	Null
0	0	1	6/30/2010	1008949322	1	Null	Propane	Propane	Null	45,041		Sampleville Fuel Co.	Null
0	0	1	5/31/2010	1008949322	1	Null	Propane	Propane	Null	45,041		Sampleville Fuel Co.	Null

Figure 17A: Step 3 in Exporting the Underlying Data

Length of bar	Width of bar	Number of Records	Usage End Date (null filter)	Account #	Fuel (family)
0	0	1	12/31/2009	1008949322	Propane
2.548	73.03	1	11/30/2009	1008949322	Propane
0	0	1	10/31/2009	1008949322	Propane
0	0	1	9/30/2009	1008949322	Propane
0	0	1	8/31/2009	1008949322	Propane
0	0	1	7/31/2009	1008949322	Propane
0	0	1	6/30/2010	1008949322	Propane
0	0	1	5/31/2010	1008949322	Propane
0	0	1	4/30/2010	1008949322	Propane
8.008	180.4	1	3/31/2010	1008949322	Propane
0	0	1	2/28/2010	1008949322	Propane

Figure 17B: Step 4 in Exporting the Underlying Data

The data can then be manipulated at will for more sophisticated analysis.

Appendix

MassEnergyInsight offers many reports. Those highlighted above make it easy for users to start using the system to understand their energy use and make energy decisions. This Appendix contains the complete set of MassEnergyInsight reports that are available as well as a quick guide to how a MassEnergyInsight user might use each of the reports.

Reports Matrix - If you want to do the following, use the checked report(s)	Overall Use, Emissions and Cost	Baseline Dashboard	Baseline - Weather Normalized	Use and Cost Table	Annual Usage Patterns - Town	Usage Trends - Town	Use and Cost This Year to Last	Buildings to Target	Building Dashboard	School Benchmarks	Monitoring Use Dashboard	Monitoring Cost Dashboard	Setup Completeness Dashboard	Data Loaded - Reports	ESCO Reports	ERP Guidance Table 3 Reports
Determine whether town-wide energy use is increasing or decreasing		√				√										
See how much energy a department is using		√									√					
See the impact of weather on your town's energy use			√													
Look at town fuel mix and greenhouse gas impacts	√															
Get a snapshot of town energy use and cost				√												
Compare your energy spending to last year							√									
Compare your electricity/gas/oil/propane use to prior years					√											
Determine which building(s) are highest priority for efficiency improvements								√								
Examine a buildings' energy use									√							
Compare town schools to others in Massachusetts										√						
Report on quarterly energy use for individual fuels											√					
Report on quarterly energy cost for individual fuels												√				
See if my town has completed its MassEnergyInsight set-up													√			
Determine what data is included in MassEnergyInsight														√		
Download energy use information to provide to your ESCO for a performance contract annual report															√	
Apply to become a Green Community																√
Provide energy use for Green Community Annual Report																√

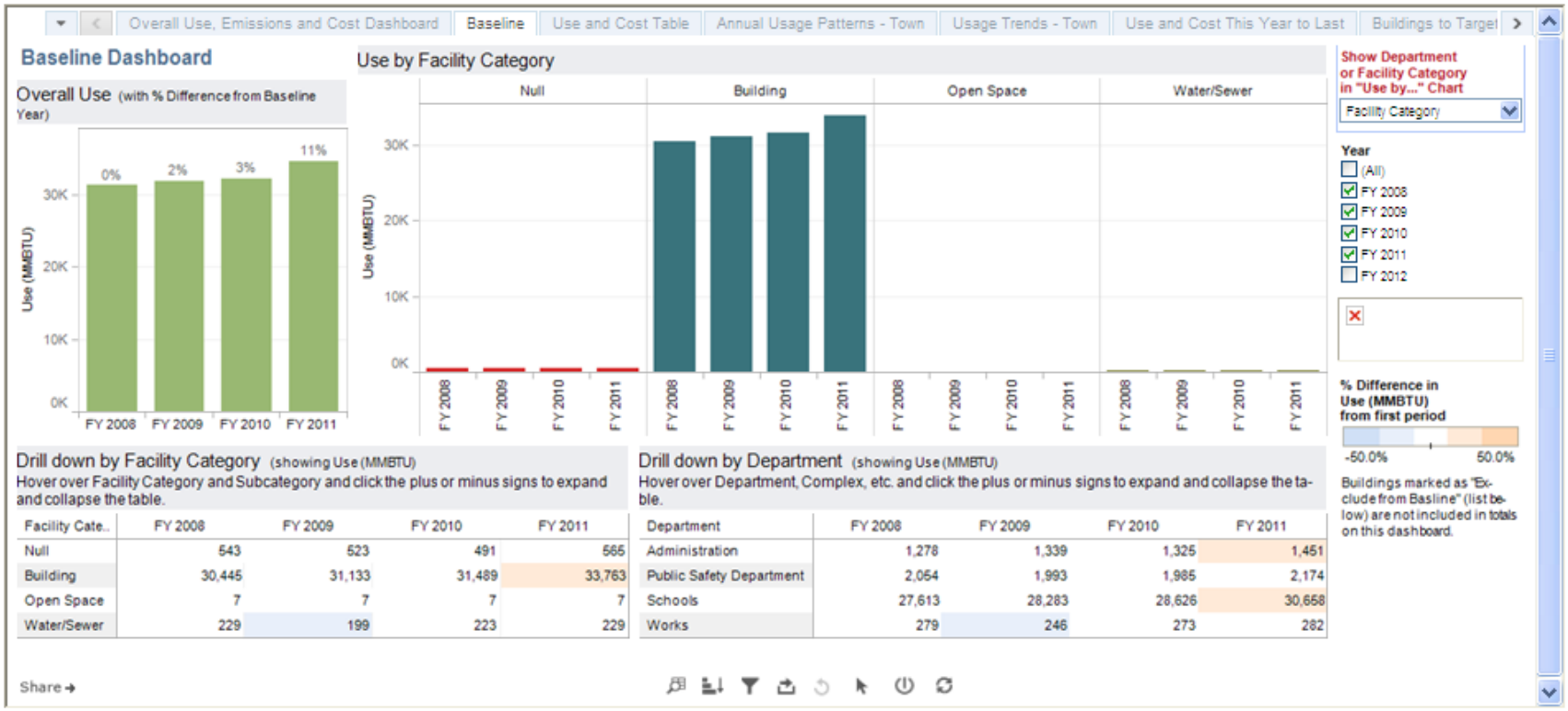
Overall Use, Emissions and Cost

Use this report to quickly see your fuel mix and assess your greenhouse gas impacts.

The upper "Overall Use, Emissions and Cost by Fuel as a Percent of Total" graph shows the total use by fuel type, the resulting greenhouse gas emissions, and cost. The lower "Use, Emissions and Cost by Item Level" graph attributes the use, emissions, OR cost to departments and has a drill-down to the department/complex/facility/unit/account levels.

Baseline

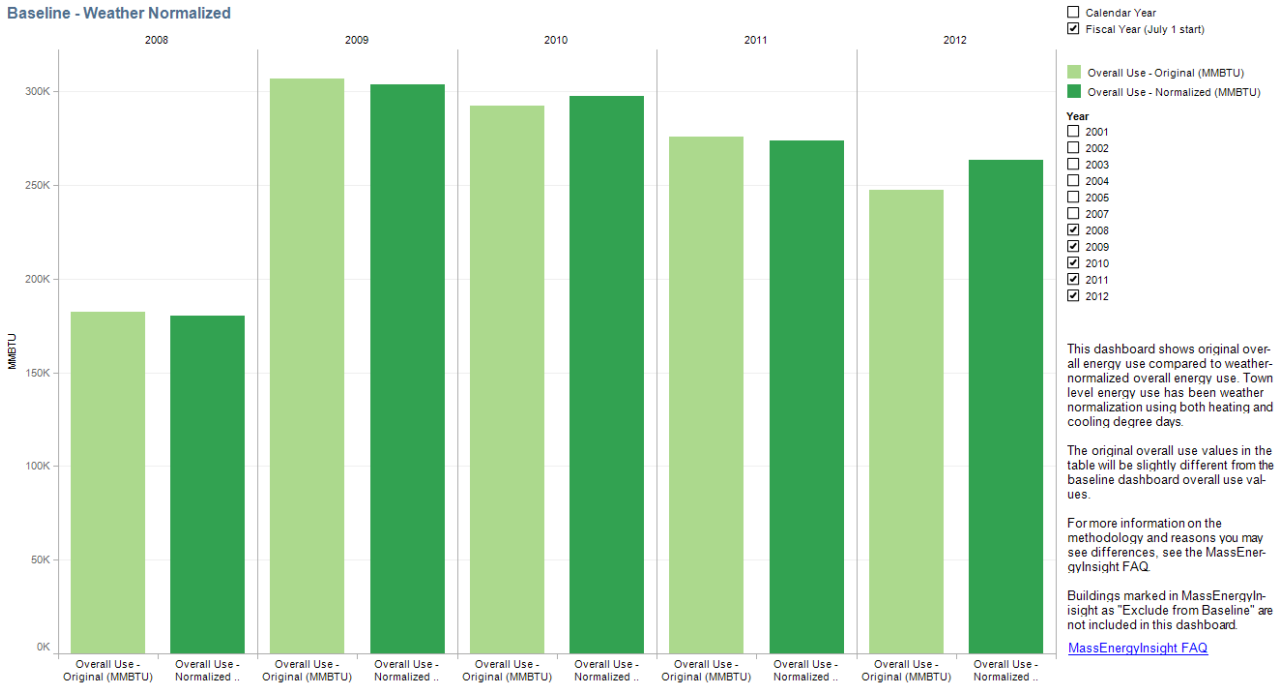
Use this report to see your "big picture" energy use and whether it is increasing, decreasing, or staying the same.



The left "Overall Use" graph shows the overall percent change in energy usage from the baseline year (the first year selected). The right "Use by Facility Category" graph displays total usage by department or category and is useful for discussing energy usage with department heads. The lower left "Drill down by Facility Category" table shows the numeric energy use by category, while the lower right "Drill down by Department" table shows the numeric energy use by department. Both tables can drill down to the department/complex/facility/unit/account levels.

Baseline – Weather Normalized

Use this report to see the impact of temperature on the energy baseline of the entire municipality or entity

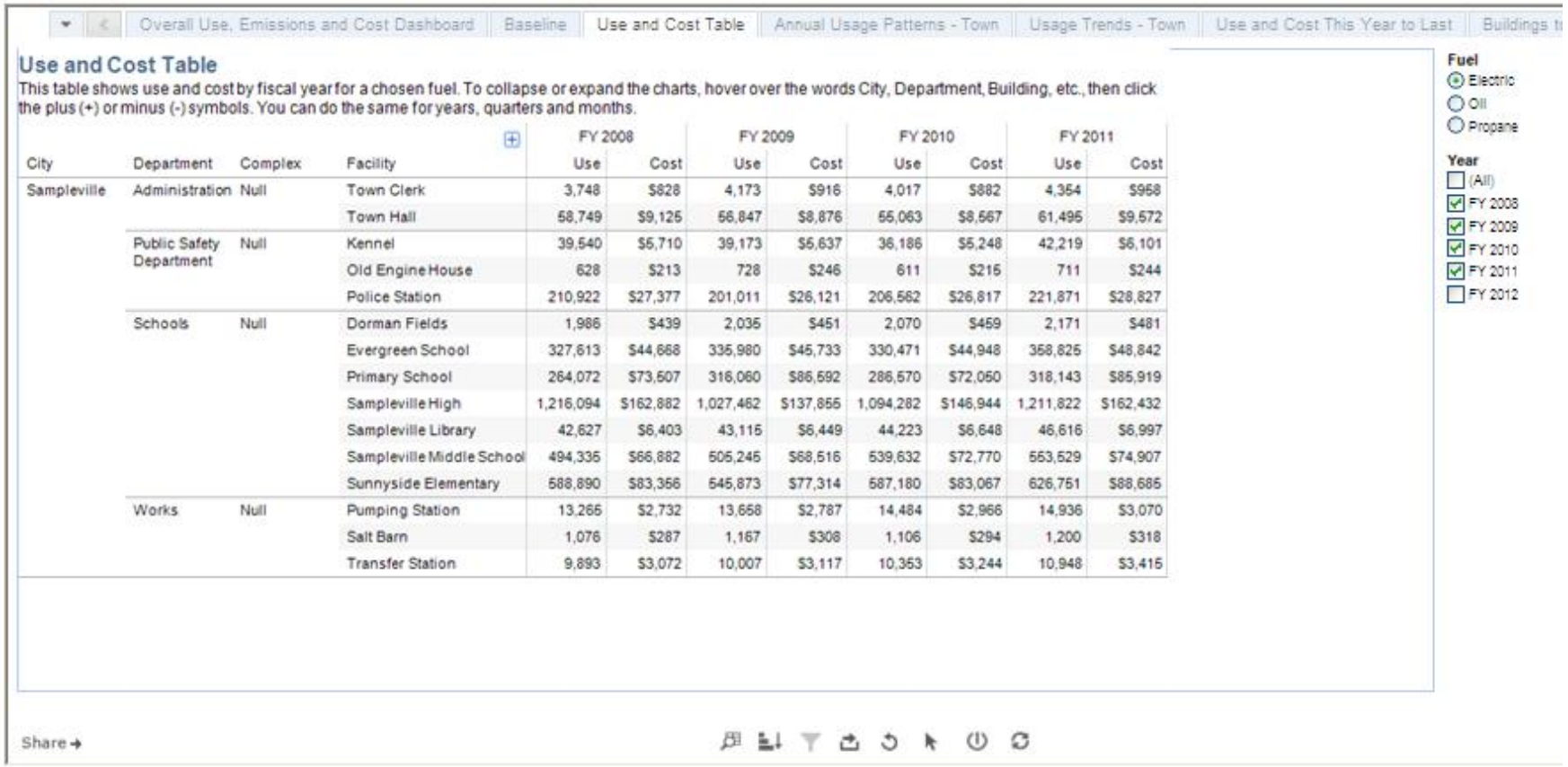


		Diesel	Electric	Gas	Gasoline	Oil	Propane	Grand Total
2008	Overall Use - Normalized (MMBTU)		76,337	103,665			197	180,199
	Overall Use - Original (MMBTU)		76,416	105,861			185	182,461
2009	Overall Use - Normalized (MMBTU)	648	106,238	186,704	9,712		336	303,638
	Overall Use - Original (MMBTU)	648	106,097	190,111	9,712		349	306,918
2010	Overall Use - Normalized (MMBTU)		132,039	164,136		562	586	297,324
	Overall Use - Original (MMBTU)		132,033	159,241		520	586	292,380
2011	Overall Use - Normalized (MMBTU)		102,868	169,823		338	676	273,705
	Overall Use - Original (MMBTU)		103,051	171,963		309	619	275,941
2012	Overall Use - Normalized (MMBTU)		91,916	171,565				263,481
	Overall Use - Original (MMBTU)		92,479	154,728				247,207

The graph compares energy use that is not normalized to temperature (in light green) to energy use that has been normalized to heating and cooling degree days (in dark green). Fiscal or calendar year can be selected. The table below provides this information numerically.

Use and Cost Table

Use this report to view fuel use and costs side by side for every building by department.

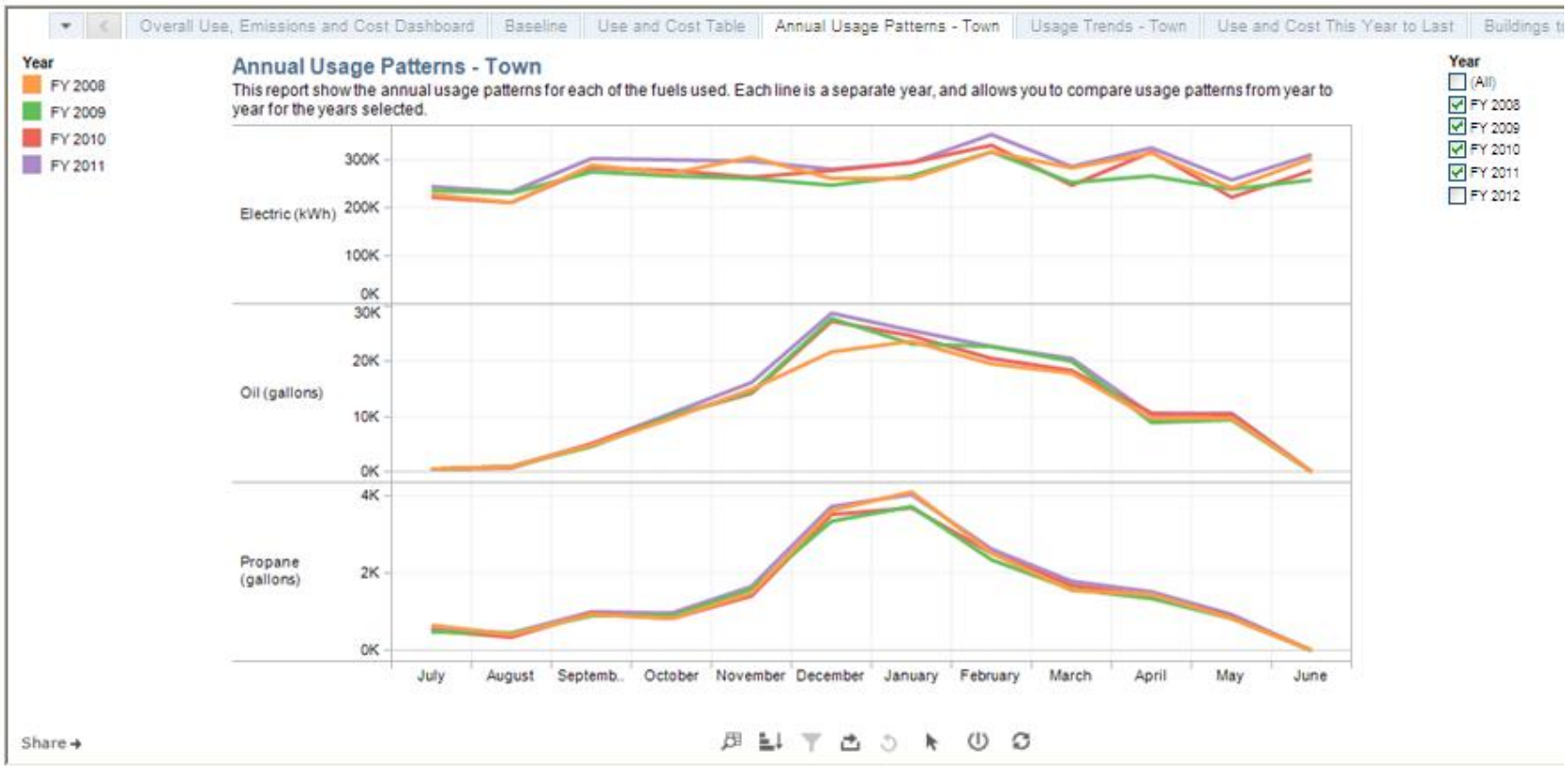


City	Department	Complex	Facility	FY 2008 Use	FY 2008 Cost	FY 2009 Use	FY 2009 Cost	FY 2010 Use	FY 2010 Cost	FY 2011 Use	FY 2011 Cost
Sampleville	Administration	Null	Town Clerk	3,748	$828	4,173	$916	4,017	$882	4,354	$968
			Town Hall	58,749	$9,125	56,847	$8,876	55,063	$8,567	61,495	$9,572
	Public Safety Department	Null	Kennel	39,540	$5,710	39,173	$5,637	36,186	$5,248	42,219	$6,101
			Old Engine House	628	$213	728	$246	611	$215	711	$244
			Police Station	210,922	$27,377	201,011	$26,121	206,562	$26,817	221,871	$28,827
	Schools	Null	Dorman Fields	1,986	$439	2,035	$451	2,070	$459	2,171	$481
			Evergreen School	327,613	$44,668	335,980	$45,733	330,471	$44,948	358,825	$48,842
			Primary School	264,072	$73,507	316,060	$86,592	286,570	$72,050	318,143	$85,919
			Sampleville High	1,216,094	$162,882	1,027,462	$137,855	1,094,282	$146,944	1,211,822	$162,432
			Sampleville Library	42,627	$6,403	43,115	$6,449	44,223	$6,648	46,616	$6,997
			Sampleville Middle School	494,335	$66,882	505,245	$68,516	539,632	$72,770	553,529	$74,907
			Sunnyside Elementary	588,890	$83,356	545,873	$77,314	587,180	$83,067	626,751	$88,685
	Works	Null	Pumping Station	13,266	$2,732	13,658	$2,787	14,484	$2,966	14,936	$3,070
			Salt Barn	1,076	$287	1,167	$308	1,106	$294	1,200	$318
			Transfer Station	9,893	$3,072	10,007	$3,117	10,353	$3,244	10,948	$3,415

This table shows the total energy use and cost for each department/complex/facility/unit/account.

Annual Usage Patterns – Town

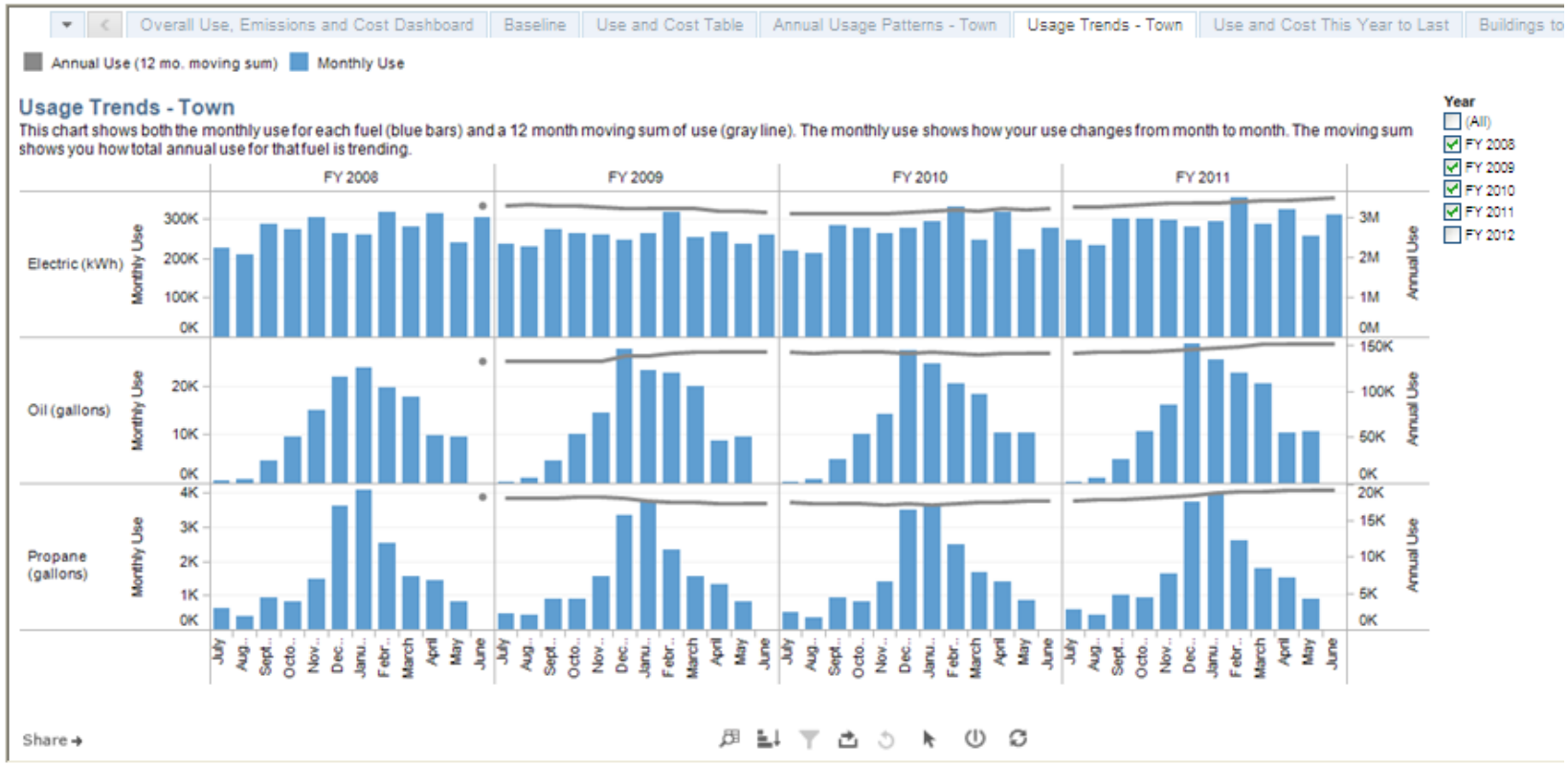
Use this report when you want to compare your fuel use from one year to another.



Multiple years of energy usage by fuel are superimposed using different colors to facilitate comparison between years.

Usage Trends – Town

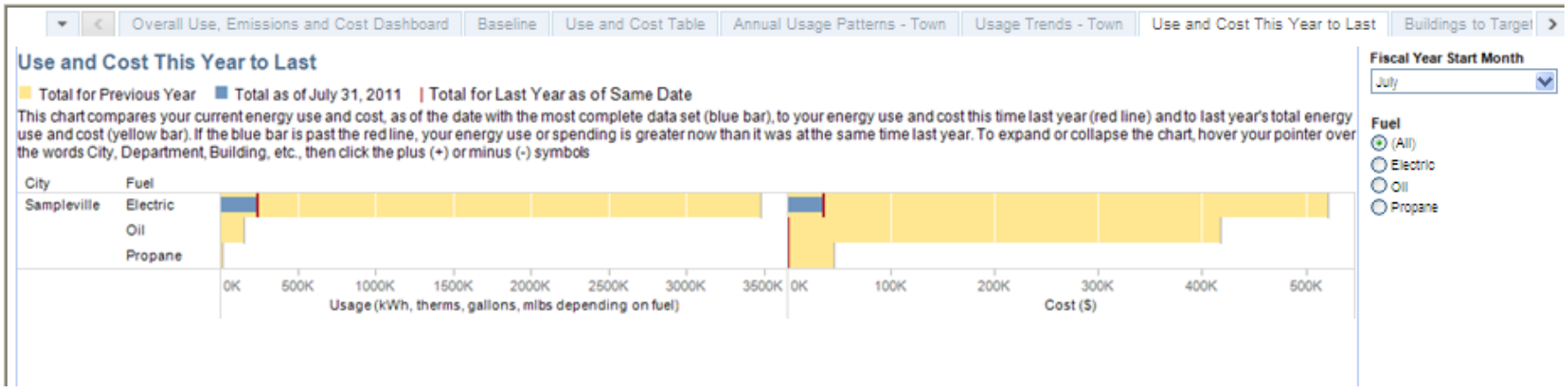
Use this report to examine your energy use trends over time and see the impact of efficiency and renewable projects. It can also be used to see if a chosen baseline year is appropriate. An appropriate baseline year is one in which declining trends of energy usage can be seen over the subsequent years.



This graph shows monthly energy use for each fuel and a 12-month rolling sum.

Use and Cost This Year to Last

Use this graph to compare this year's energy use and cost to the same time in the prior year.



This graph shows the current year's energy use and cost shown in blue. It is superimposed on the previous year's energy use and cost shown in yellow. Last year's energy use and cost at the comparable time to this year is shown as a red line. Fiscal year (July) or calendar year (January) can be selected.

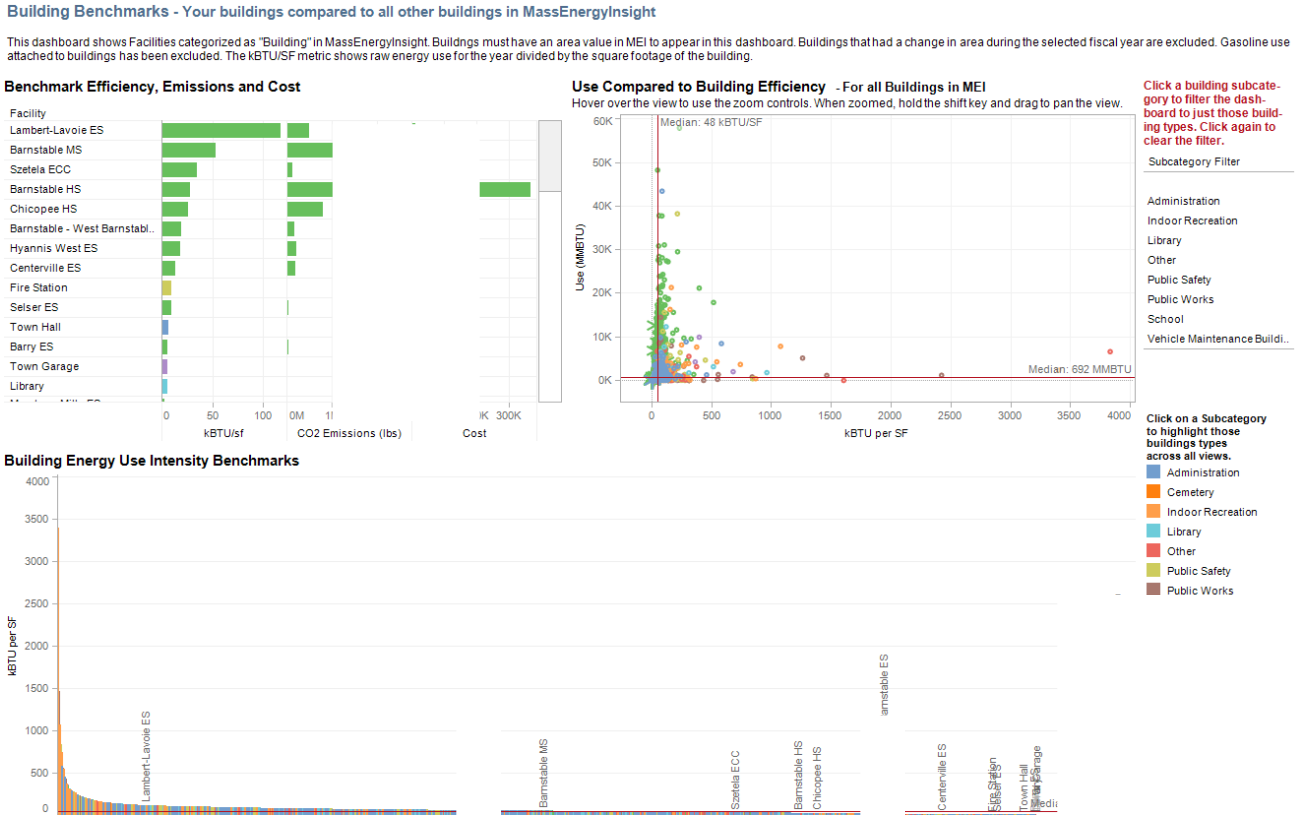
Buildings to Target

Use this graph to quickly identify your municipality's least efficient buildings.

The upper left "Building Efficiency, Emissions and Cost" graph ranks facilities in descending order of their efficiency (in kBtu/sqft) and also illustrates their greenhouse gas emissions and energy costs. The lower left graph also displays facilities in descending order of their efficiency (in kBtu/sqft). The right "Efficiency and Use" graph plots facilities based upon their efficiency on the x-axis and upon their energy use in the y-axis. This means that the least efficient and highest energy-using facilities are shown in the upper right quadrant. These facilities make excellent targets for energy efficiency actions.

Building Benchmarks

Use this graph to compare your buildings to all other buildings in MassEnergyInsight. All buildings or specific subcategories (Administration, Library, Public Safety, etc.) can be selected.



The upper left "Benchmark Efficiency, Emissions and Cost" graph ranks facilities in descending order of their efficiency (in kBtu/sqft) and also illustrates their greenhouse gas emissions and energy costs. The upper right "Use Compared to Building Efficiency" graph plots facilities based upon their efficiency on the x-axis and upon their energy use in the y-axis. This means that the least efficient and highest energy-using facilities are shown in the upper-right quadrant. Your buildings are shown as asterisks, all others as open circles. Finally, the lower "Building Energy Use Intensity Benchmarks" graph displays facilities in descending order of their efficiency (in kBtu/sqft). For all, the building subcategory is denoted by the color of the bar or symbol.

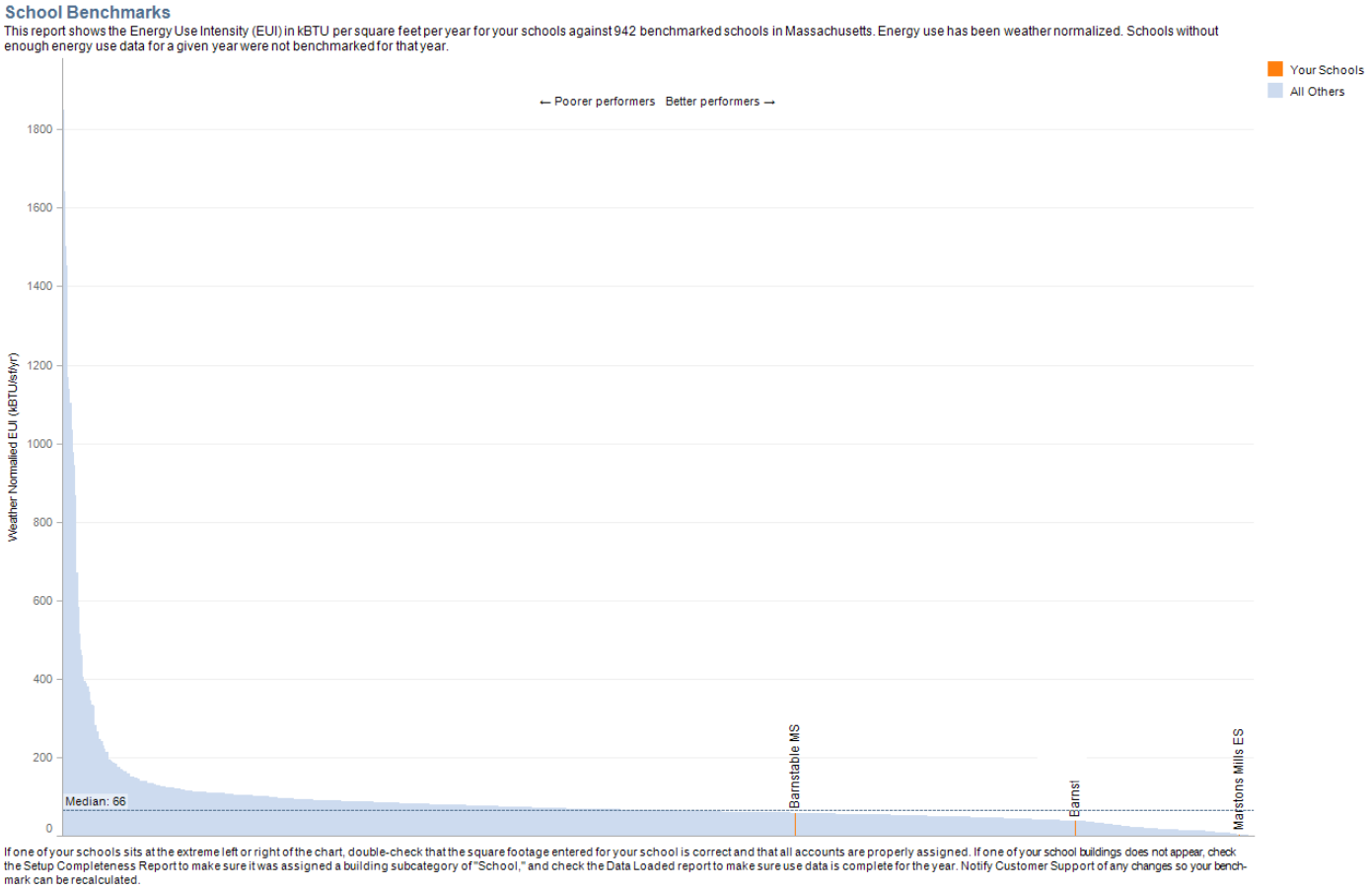
Building Dashboard

Use this report examine the detailed energy consumption patterns for a specific building. **Interventions, such as efficiency or renewable projects, can be noted on this report.**

The upper right "Usage Trends" graph shows facility energy use for each fuel over time. The bars indicate monthly usage, while the line is a 12-month rolling sum. The lower right "Cost Trends" graph shows the cost for each of these fuels. Again, the bars bars indicate monthly usage while the line is a rolling sum. The right "Annual Usage Patterns" graph superimposes multiple years of energy use using different colors to facilitate comparison between years.

School Benchmarks

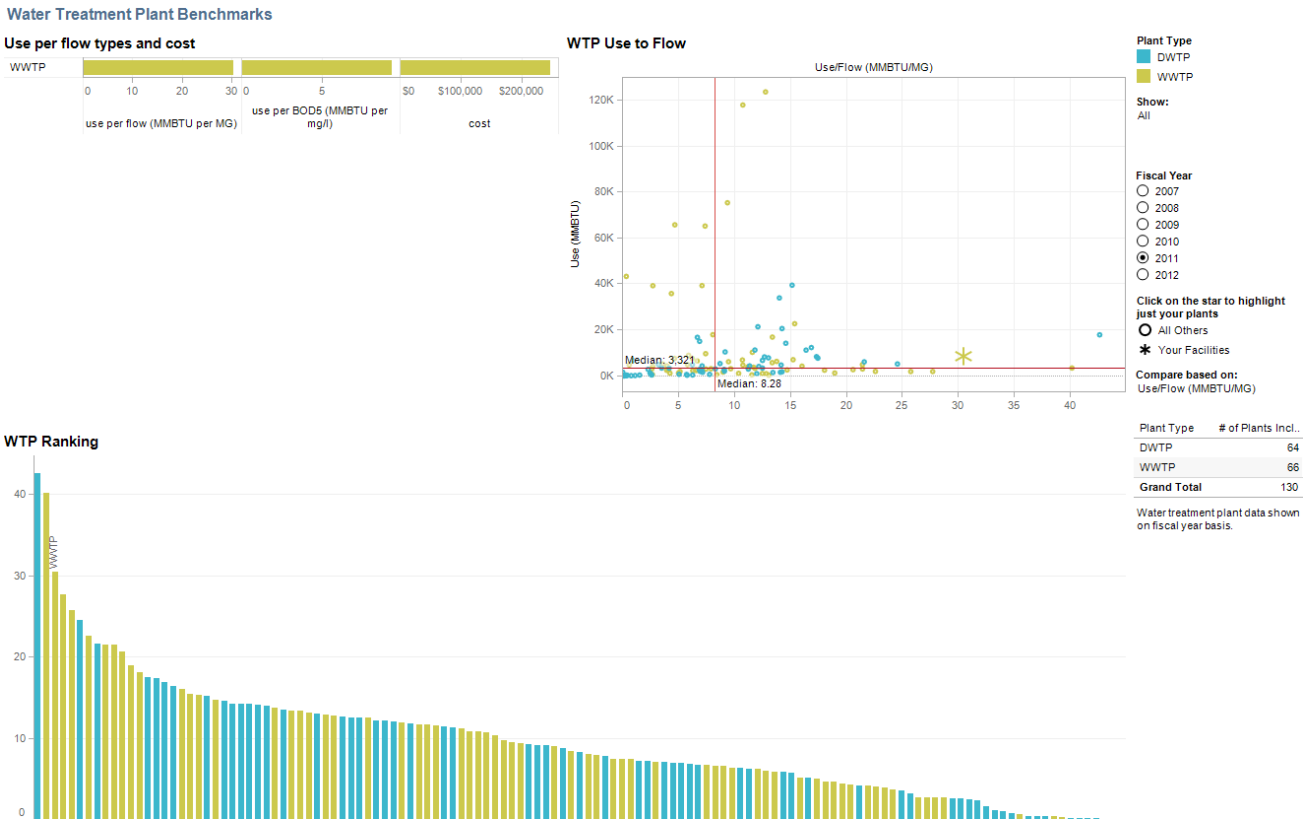
Use this report to compare the efficiency of your schools to others in MassEnergyInsight.



This graph shows your schools in orange and compares them to other schools in MassEnergyInsight for a particular year. The median is shown as a horizontal line. The type of school can be selected (high school, elementary, etc.). The more efficient schools are on the right, less efficient schools to the left. Typically, high schools will use more energy per square foot. This data has been weather-normalized for heating and cooling degree days.

Water Treatment Plant Benchmarks

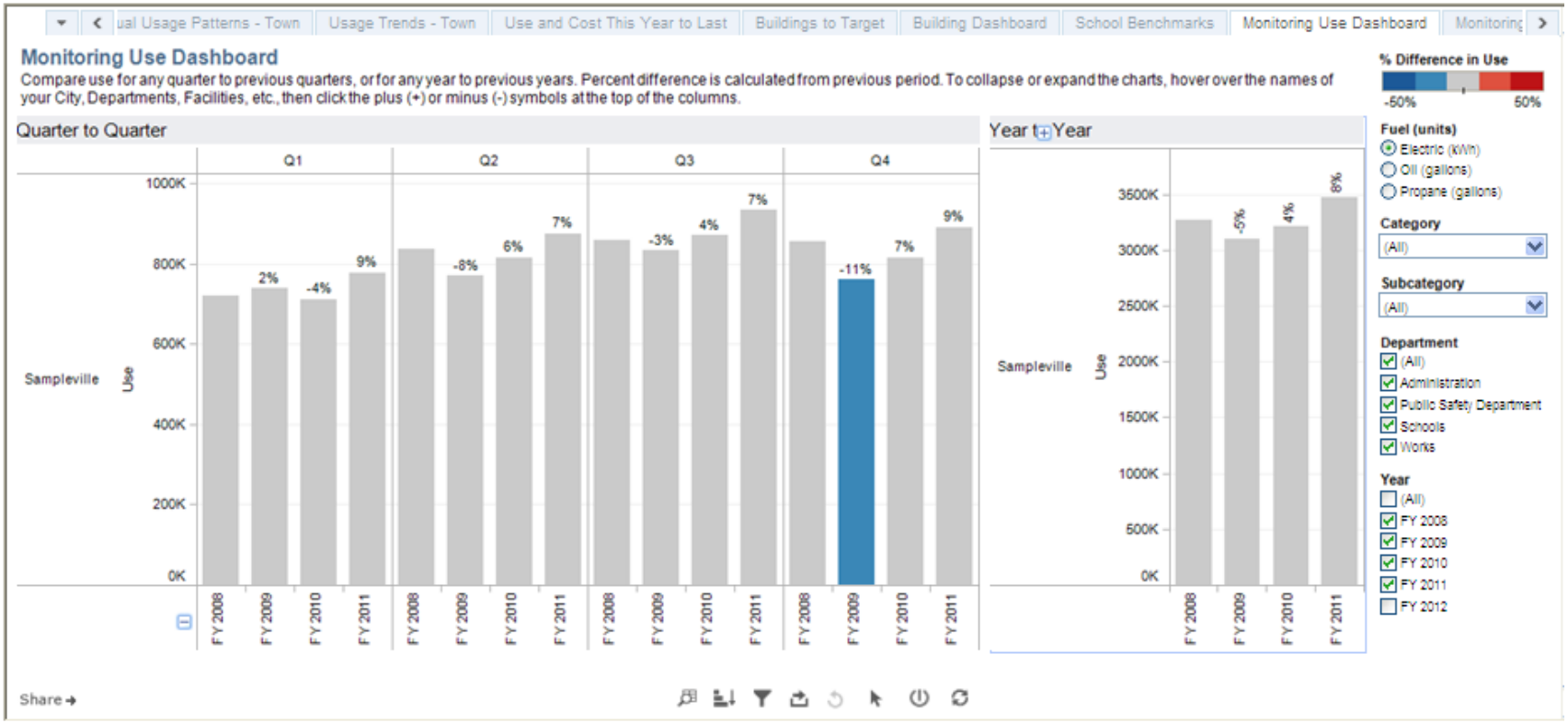
Use this report to compare the efficiency of your drinking water or wastewater treatment plant to others in MassEnergyInsight.



The upper left "Use per flow types and cost" graph shows the energy intensity of your drinking water or wastewater treatment plant by normalizing the total energy use to the annual flow. For wastewater treatment plants, energy use is also normalized to the BOD5, a measure of the amount of treatment the wastewater requires. Total energy costs are also shown. The upper right "WTP Use to Flow" graph plots facilities based upon their energy use/flow efficiency (in MMBtu/million gallons) on the x-axis and upon their total energy use in the y-axis. This means that the least efficient and highest-energy using facilities are shown in the upper right quadrant. Your facilities are shown as asterisks, all others as open circles. Finally, the lower "WTP Ranking" graph displays facilities in descending order of their efficiency (in MMBtu/MG).

Monitoring Use Dashboard

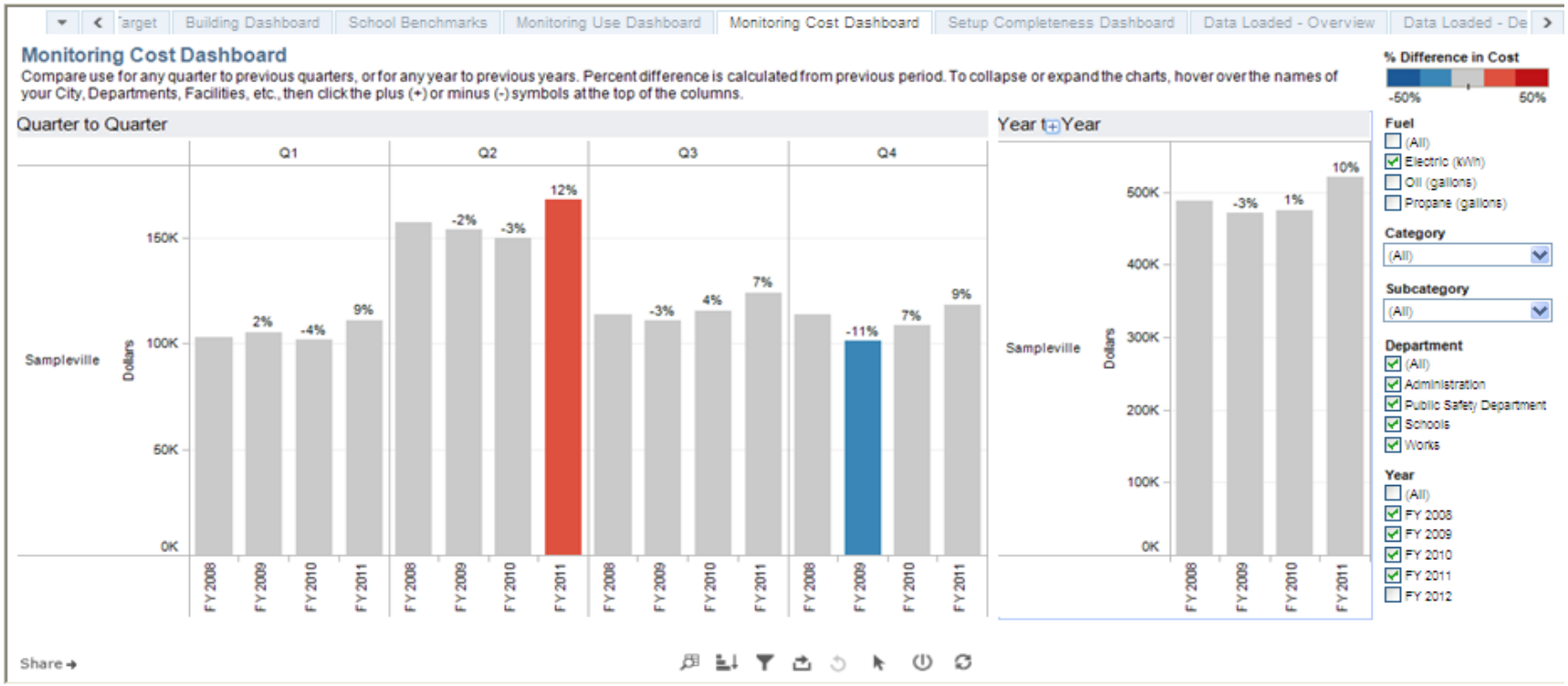
Use this report to monitor and compare fuel use by department or category, from quarter to quarter and year to year.



The left "Quarter to Quarter" graph shows the quarterly percent change in energy usage for the selected fuel. Blue indicates a percentage decrease, red indicates a percentage increase. You can select by category, subcategory, department and year. The left "Year to Year" graph shows the annual percent change in energy usage for the selected fuel.

Monitoring Cost Dashboard

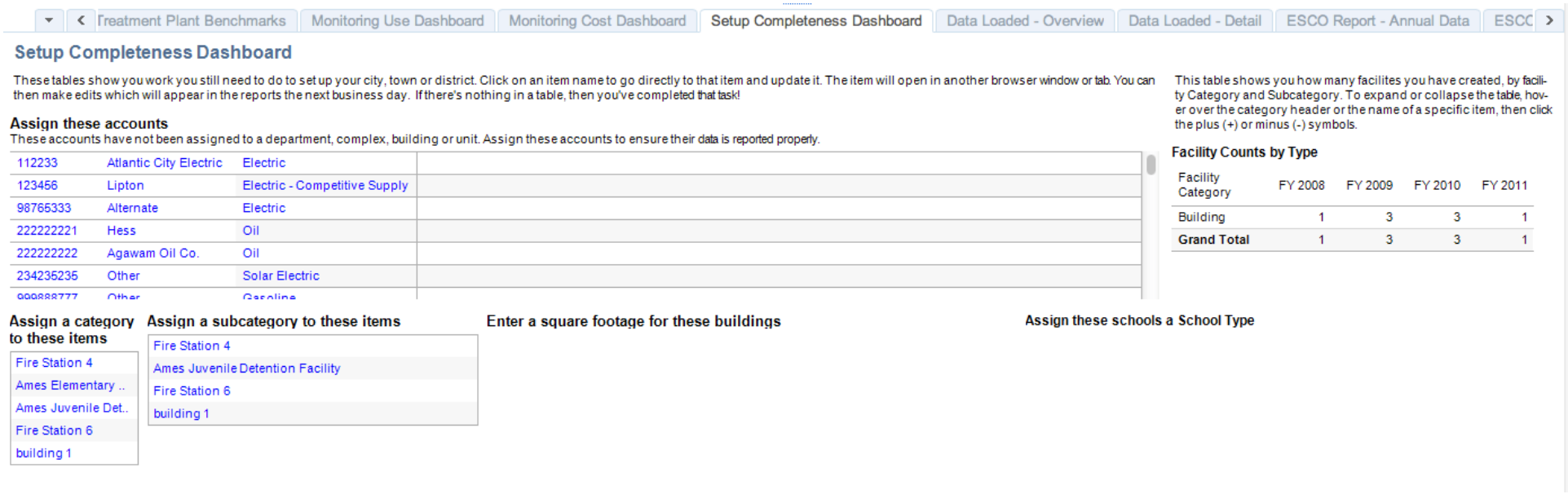
Use this report to monitor and compare fuel cost by department or category, from quarter to quarter and year to year.



The left "Quarter to Quarter" graph shows the quarterly percent change in energy cost for the selected fuel. Blue indicates a percentage decrease, red indicates a percentage increase. You can select by category, subcategory, department and year. The left "Year to Year" graph shows the annual percent change in energy cost for the selected fuel.

Setup Completeness Dashboard

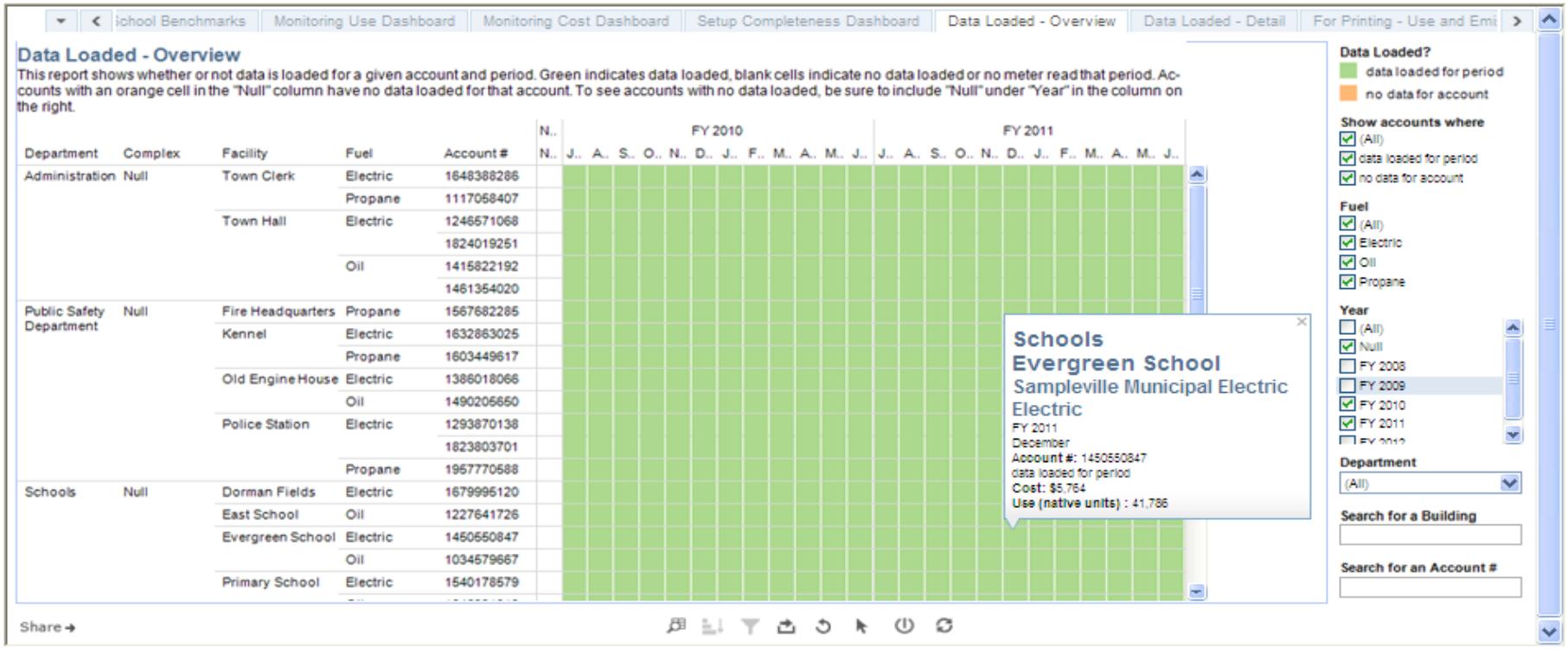
Use this report to finish setting up your facilities listings completely and correctly. This report is useful for bringing attention to any omissions the user might have made when creating the facilities, such as highlighting any that have not been assigned a category, sub-category, and square footage.



These five tables show information needed to complete setup: (1) Shows Accounts that need assigning, (2) facilities that need to be assigned a category, (3) facilities that need to be assigned a subcategory, (4) buildings that need square footage assigned, and (5) schools that need to be assigned a School Type. Finally, the upper left "Facility Counts by Type" table shows how many facilities you have created is listed by Facility Category and Subcategory.

Data Loaded – Overview

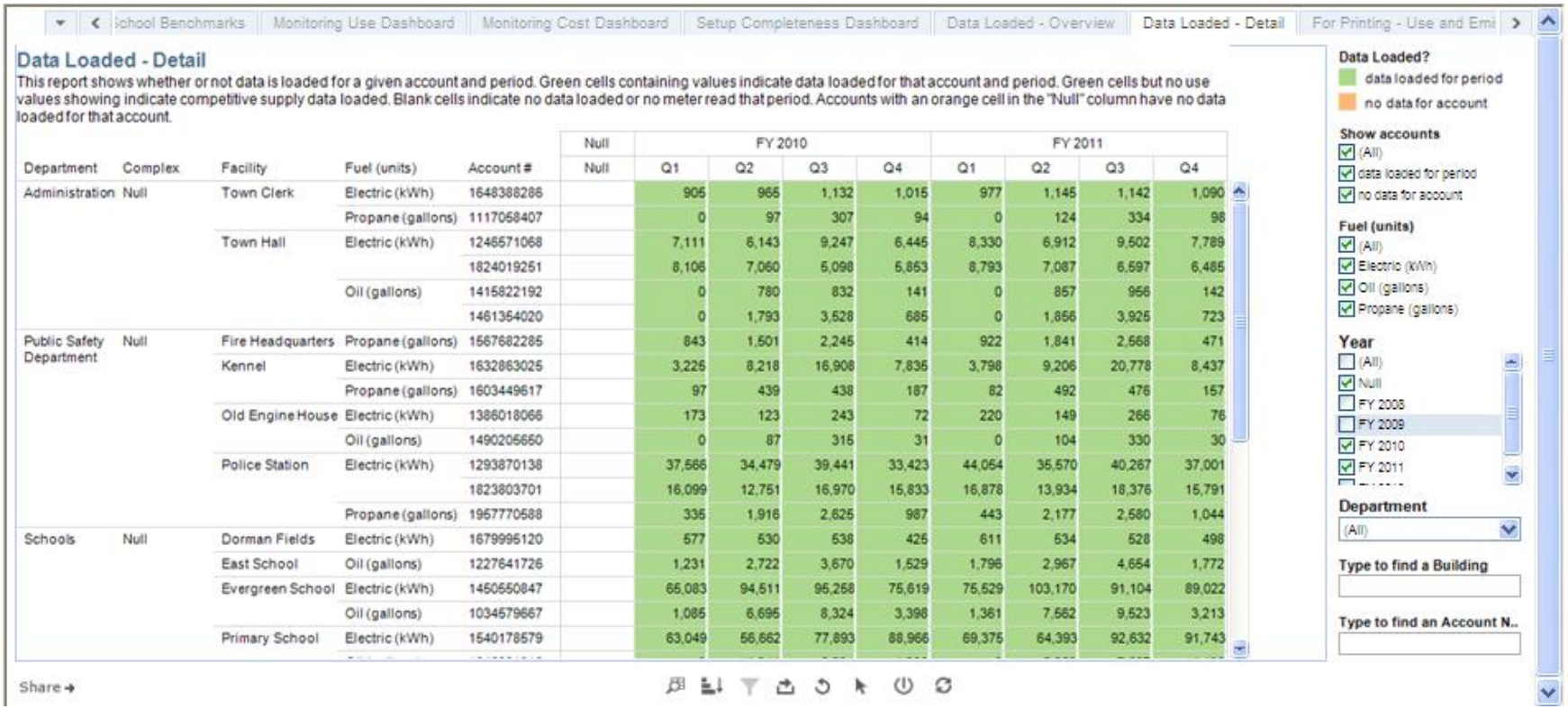
Use this report to check completeness of the underlying data, specifically which accounts are missing data for which months.



This table shows whether or not data is loaded for each department, complex, facility, unit, and account. It has a search feature, so you can do a quick search by building name or account number. Months with a white space indicate no data for that month.

Data Loaded – Detail

Use this report to quickly check if there is a question about whether the data loaded for a particular account is accurate.

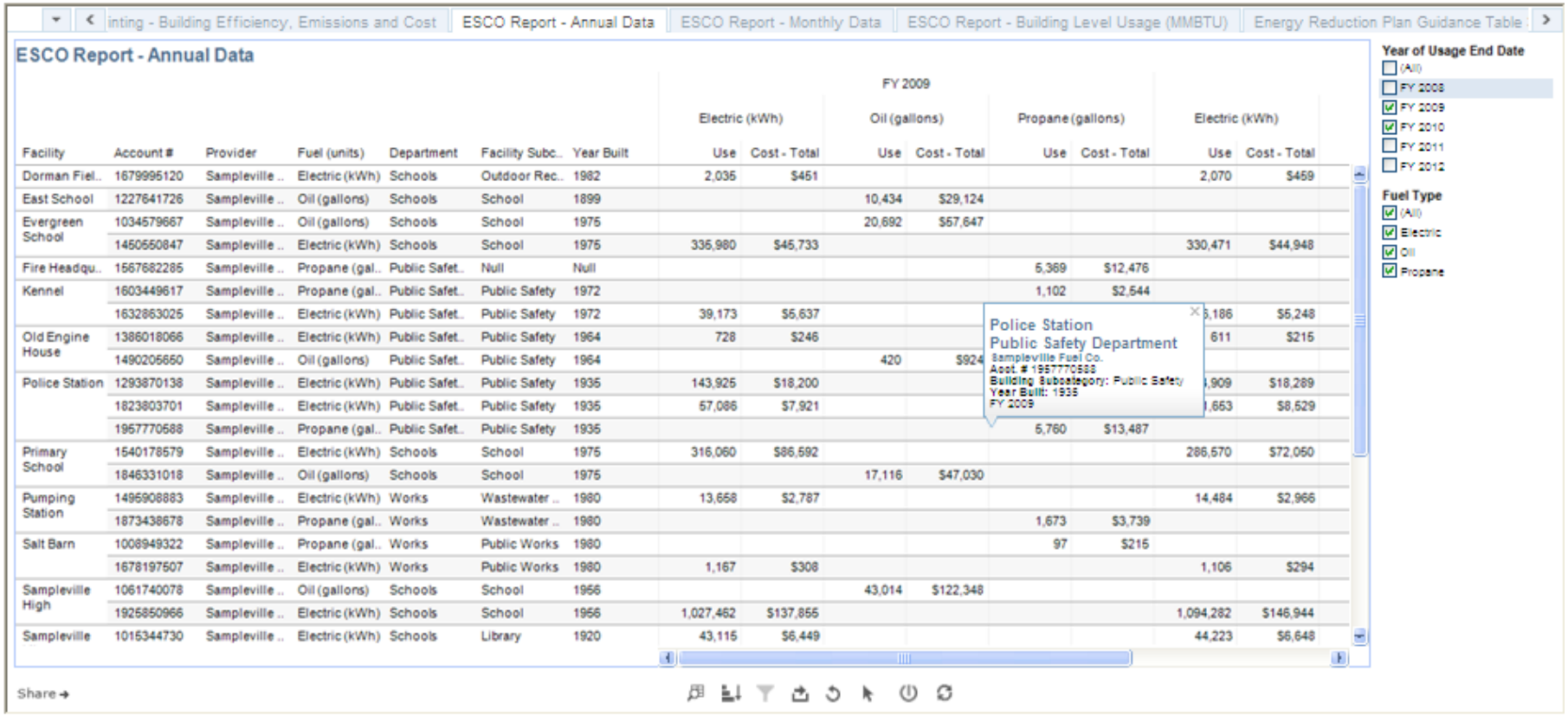


Department	Complex	Facility	Fuel (units)	Account #	Null	FY 2010 Q1	FY 2010 Q2	FY 2010 Q3	FY 2010 Q4	FY 2011 Q1	FY 2011 Q2	FY 2011 Q3	FY 2011 Q4
Administration	Null	Town Clerk	Electric (kWh)	1648388286		905	966	1,132	1,015	977	1,145	1,142	1,090
			Propane (gallons)	1117058407		0	97	307	94	0	124	334	98
		Town Hall	Electric (kWh)	1246571068		7,111	6,143	9,247	6,445	8,330	6,912	9,502	7,789
				1824019251		8,106	7,060	5,098	5,853	8,793	7,087	6,597	6,485
			Oil (gallons)	1415822192		0	780	832	141	0	857	956	142
				1461364020		0	1,793	3,528	685	0	1,856	3,925	723
Public Safety Department	Null	Fire Headquarters	Propane (gallons)	1567682285		843	1,501	2,245	414	922	1,841	2,568	471
		Kennel	Electric (kWh)	1632863025		3,225	8,218	16,908	7,835	3,798	9,206	20,778	8,437
			Propane (gallons)	1603449617		97	439	438	187	82	492	476	157
		Old Engine House	Electric (kWh)	1386018066		173	123	243	72	220	149	266	76
			Oil (gallons)	1490206650		0	87	316	31	0	104	330	30
		Police Station	Electric (kWh)	1293870138		37,566	34,479	39,441	33,423	44,054	35,570	40,267	37,001
				1823803701		16,099	12,751	16,970	15,833	16,878	13,934	18,376	15,791
			Propane (gallons)	1957770588		335	1,916	2,625	987	443	2,177	2,580	1,044
Schools	Null	Dorman Fields	Electric (kWh)	1679996120		577	530	538	425	611	534	528	498
		East School	Oil (gallons)	1227641726		1,231	2,722	3,670	1,529	1,796	2,967	4,654	1,772
		Evergreen School	Electric (kWh)	1450650847		65,083	94,511	95,258	75,619	75,529	103,170	91,104	89,022
			Oil (gallons)	1034579667		1,085	6,695	8,324	3,398	1,361	7,662	9,523	3,213
		Primary School	Electric (kWh)	1540178579		63,049	56,662	77,893	88,966	69,375	64,393	92,632	91,743

This table shows the value of the data loaded for each department, complex, facility, unit, and account. It has a search feature so you can do a quick search by building name or account number.

ESCO Report – Annual Data

Use this report to track the annual performance of facilities included in a performance contract.

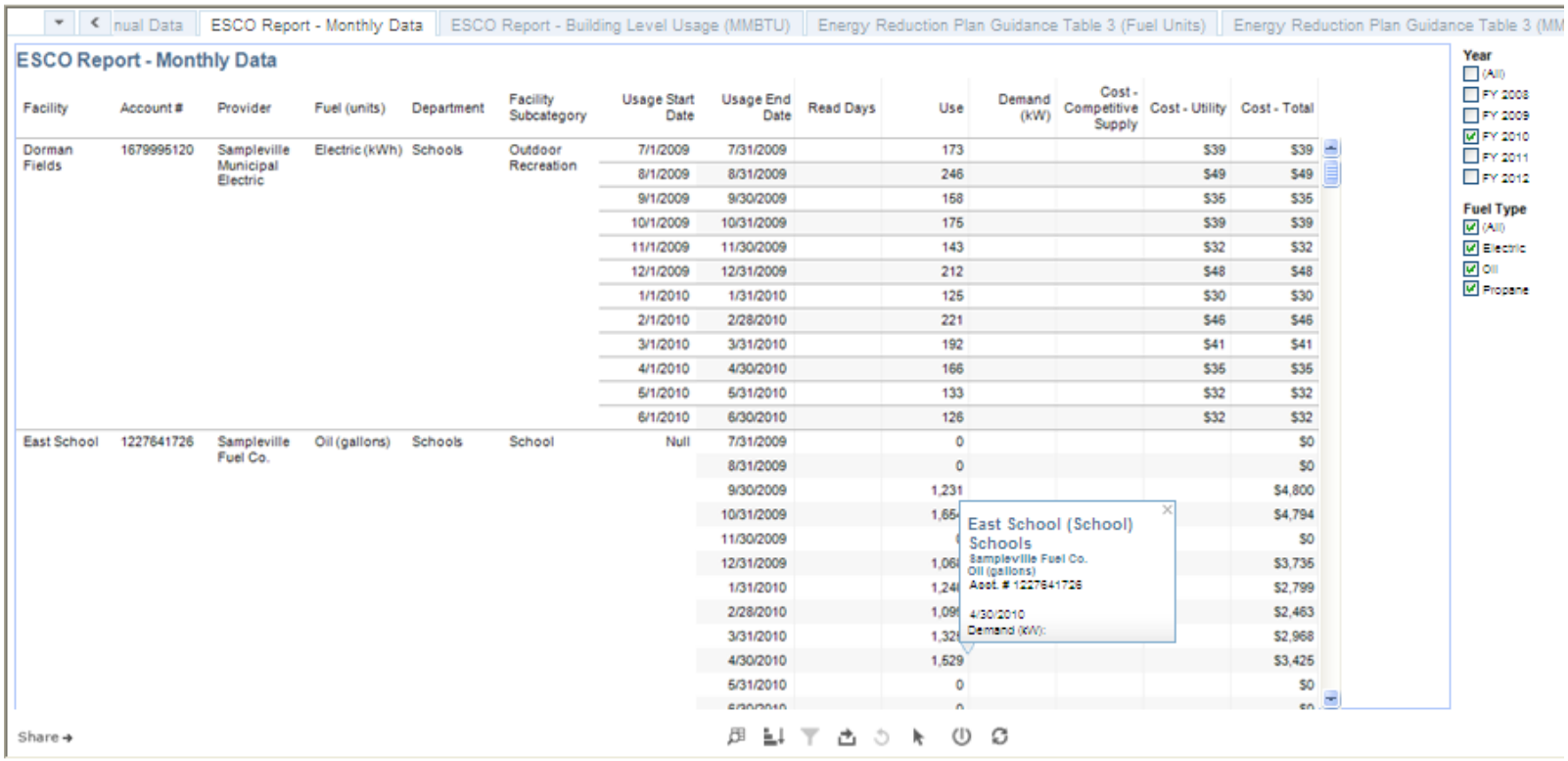


							FY 2009							
							Electric (kWh)		Oil (gallons)		Propane (gallons)		Electric (kWh)	
Facility	Account #	Provider	Fuel (units)	Department	Facility Subc..	Year Built	Use	Cost - Total	Use	Cost - Total	Use	Cost - Total	Use	Cost - Total
Dorman Fiel..	1679995120	Sampleville ..	Electric (kWh)	Schools	Outdoor Rec..	1982	2,035	$451					2,070	$459
East School	1227641726	Sampleville ..	Oil (gallons)	Schools	School	1899			10,434	$29,124				
Evergreen School	1034579667	Sampleville ..	Oil (gallons)	Schools	School	1975			20,692	$57,647				
	1450550847	Sampleville ..	Electric (kWh)	Schools	School	1975	335,980	$45,733					330,471	$44,948
Fire Headqu..	1567682285	Sampleville ..	Propane (gal..	Public Safet..	Null	Null					5,369	$12,476		
Kennel	1603449617	Sampleville ..	Propane (gal..	Public Safet..	Public Safety	1972					1,102	$2,544		
	1632863025	Sampleville ..	Electric (kWh)	Public Safet..	Public Safety	1972	39,173	$5,637					,186	$5,248
Old Engine House	1386018066	Sampleville ..	Electric (kWh)	Public Safet..	Public Safety	1964	728	$246					611	$215
	1490205650	Sampleville ..	Oil (gallons)	Public Safet..	Public Safety	1964			420	$924				
Police Station	1293870138	Sampleville ..	Electric (kWh)	Public Safet..	Public Safety	1935	143,925	$18,200					,909	$18,289
	1823803701	Sampleville ..	Electric (kWh)	Public Safet..	Public Safety	1935	57,086	$7,921					,653	$8,529
	1957770588	Sampleville ..	Propane (gal..	Public Safet..	Public Safety	1935					5,760	$13,487		
Primary School	1540178579	Sampleville ..	Electric (kWh)	Schools	School	1975	316,060	$86,592					286,570	$72,050
	1846331018	Sampleville ..	Oil (gallons)	Schools	School	1975			17,116	$47,030				
Pumping Station	1495908883	Sampleville ..	Electric (kWh)	Works	Wastewater ..	1980	13,658	$2,787					14,484	$2,966
	1873438678	Sampleville ..	Propane (gal..	Works	Wastewater ..	1980					1,673	$3,739		
Salt Barn	1008949322	Sampleville ..	Propane (gal..	Works	Public Works	1980					97	$215		
	1678197507	Sampleville ..	Electric (kWh)	Works	Public Works	1980	1,167	$308					1,106	$294
Sampleville High	1061740078	Sampleville ..	Oil (gallons)	Schools	School	1956			43,014	$122,348				
	1925850966	Sampleville ..	Electric (kWh)	Schools	School	1956	1,027,462	$137,855					1,094,282	$146,944
Sampleville	1015344730	Sampleville ..	Electric (kWh)	Schools	Library	1920	43,115	$6,449					44,223	$6,648

This table shows the annual energy use and cost for each fuel by individual account for facilities included in a performance contract.

ESCO Report – Monthly Data

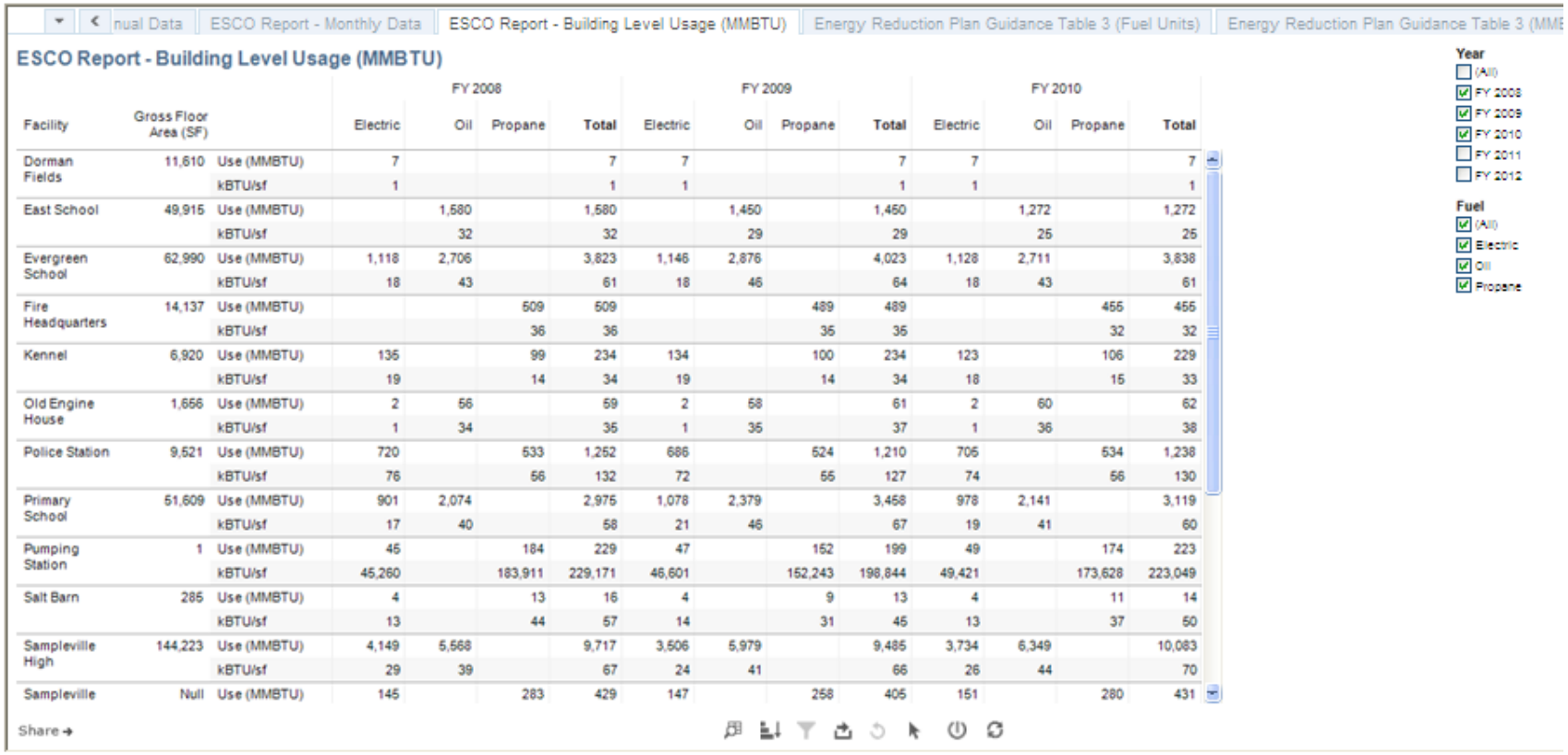
Use this report to track the monthly performance of facilities included in a performance contract.



This table shows the monthly energy use and cost for each fuel by individual account for facilities included in a performance contract. It includes the start and end dates for each reading period which can be helpful if comparing to a report with different time periods. It also includes competitive supply costs.

ESCO Report – Building Level Usage (MMBTU)

Use this report to examine the performance of facilities included in a performance contract for improvements in their overall efficiency (kbtu/sqft).



nual Data | ESCO Report - Monthly Data | ESCO Report - Building Level Usage (MMBTU) | Energy Reduction Plan Guidance Table 3 (Fuel Units) | Energy Reduction Plan Guidance Table 3 (MM

ESCO Report - Building Level Usage (MMBTU)

Year: (All), FY 2008, FY 2009, FY 2010, FY 2011, FY 2012

Fuel: (All), Electric, Oil, Propane

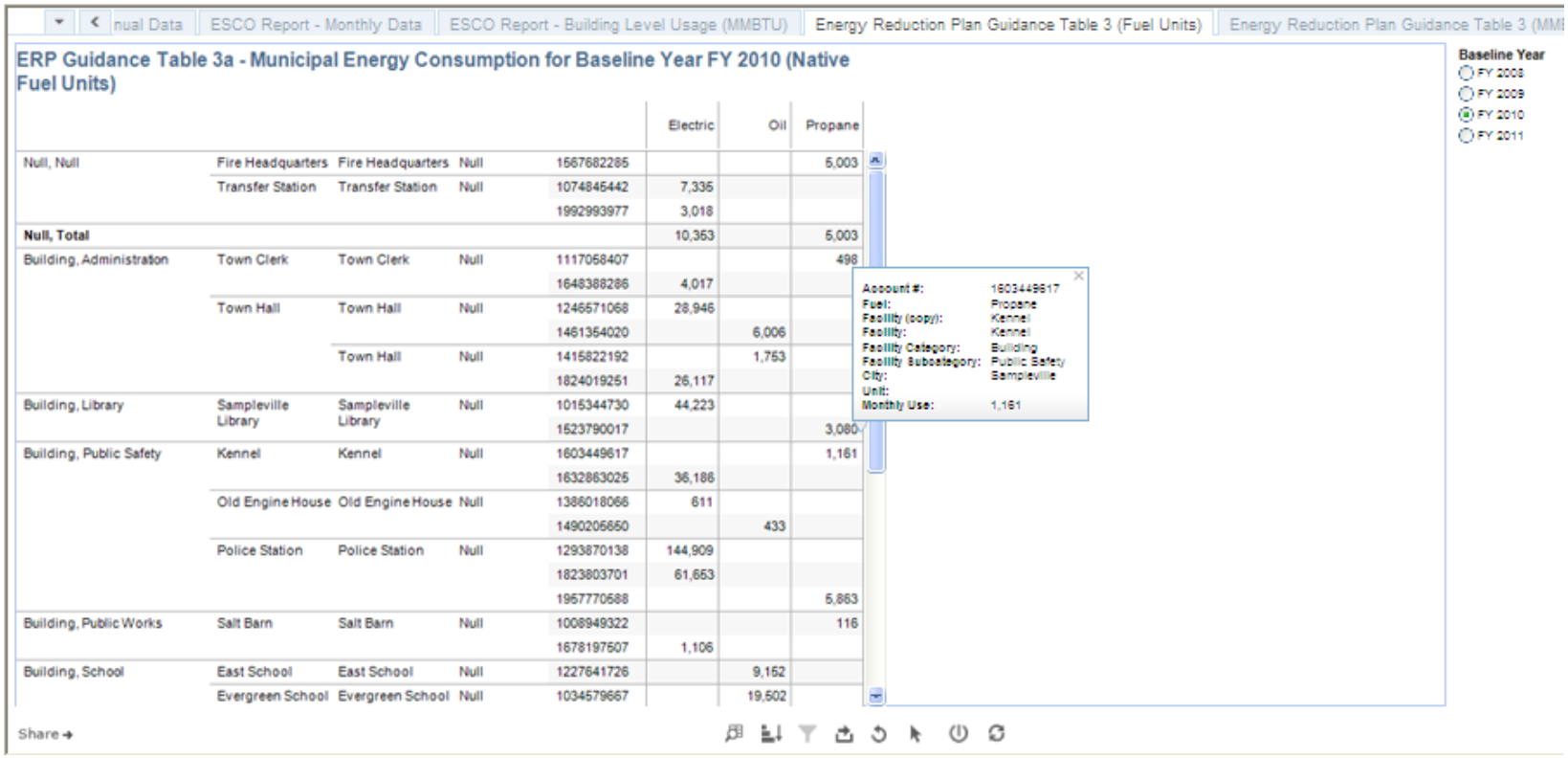
Facility	Gross Floor Area (SF)		FY 2008 Electric	FY 2008 Oil	FY 2008 Propane	FY 2008 Total	FY 2009 Electric	FY 2009 Oil	FY 2009 Propane	FY 2009 Total	FY 2010 Electric	FY 2010 Oil	FY 2010 Propane	FY 2010 Total
Dorman Fields	11,610	Use (MMBTU)	7			7	7			7	7			7
		kBTU/sf	1			1	1			1	1			1
East School	49,915	Use (MMBTU)		1,580		1,580		1,450		1,450		1,272		1,272
		kBTU/sf		32		32		29		29		25		25
Evergreen School	62,990	Use (MMBTU)	1,118	2,706		3,823	1,146	2,876		4,023	1,128	2,711		3,838
		kBTU/sf	18	43		61	18	46		64	18	43		61
Fire Headquarters	14,137	Use (MMBTU)			509	509			489	489			455	455
		kBTU/sf			36	36			35	35			32	32
Kennel	6,920	Use (MMBTU)	135		99	234	134		100	234	123		106	229
		kBTU/sf	19		14	34	19		14	34	18		15	33
Old Engine House	1,656	Use (MMBTU)	2	56		59	2	58		61	2	60		62
		kBTU/sf	1	34		35	1	35		37	1	36		38
Police Station	9,521	Use (MMBTU)	720		533	1,252	686		524	1,210	705		534	1,238
		kBTU/sf	76		56	132	72		55	127	74		56	130
Primary School	51,609	Use (MMBTU)	901	2,074		2,975	1,078	2,379		3,458	978	2,141		3,119
		kBTU/sf	17	40		58	21	46		67	19	41		60
Pumping Station	1	Use (MMBTU)	45		184	229	47		152	199	49		174	223
		kBTU/sf	45,260		183,911	229,171	46,601		152,243	198,844	49,421		173,628	223,049
Salt Barn	285	Use (MMBTU)	4		13	16	4		9	13	4		11	14
		kBTU/sf	13		44	57	14		31	45	13		37	50
Sampleville High	144,223	Use (MMBTU)	4,149	5,568		9,717	3,506	5,979		9,485	3,734	6,349		10,083
		kBTU/sf	29	39		67	24	41		66	26	44		70
Sampleville	Null	Use (MMBTU)	145		283	429	147		258	405	151		280	431

Share →

This table shows fuel usage (MMBtu) and efficiency (kBTU/sqft) for facilities included in a performance contract.

Energy Reduction Plan Guidance Table 3 (Fuel Units)

Use this report to provide the baseline for a Green Communities designation application. Designated Green Communities may use this report to directly file the annual energy use for their Annual Reports with DOER.

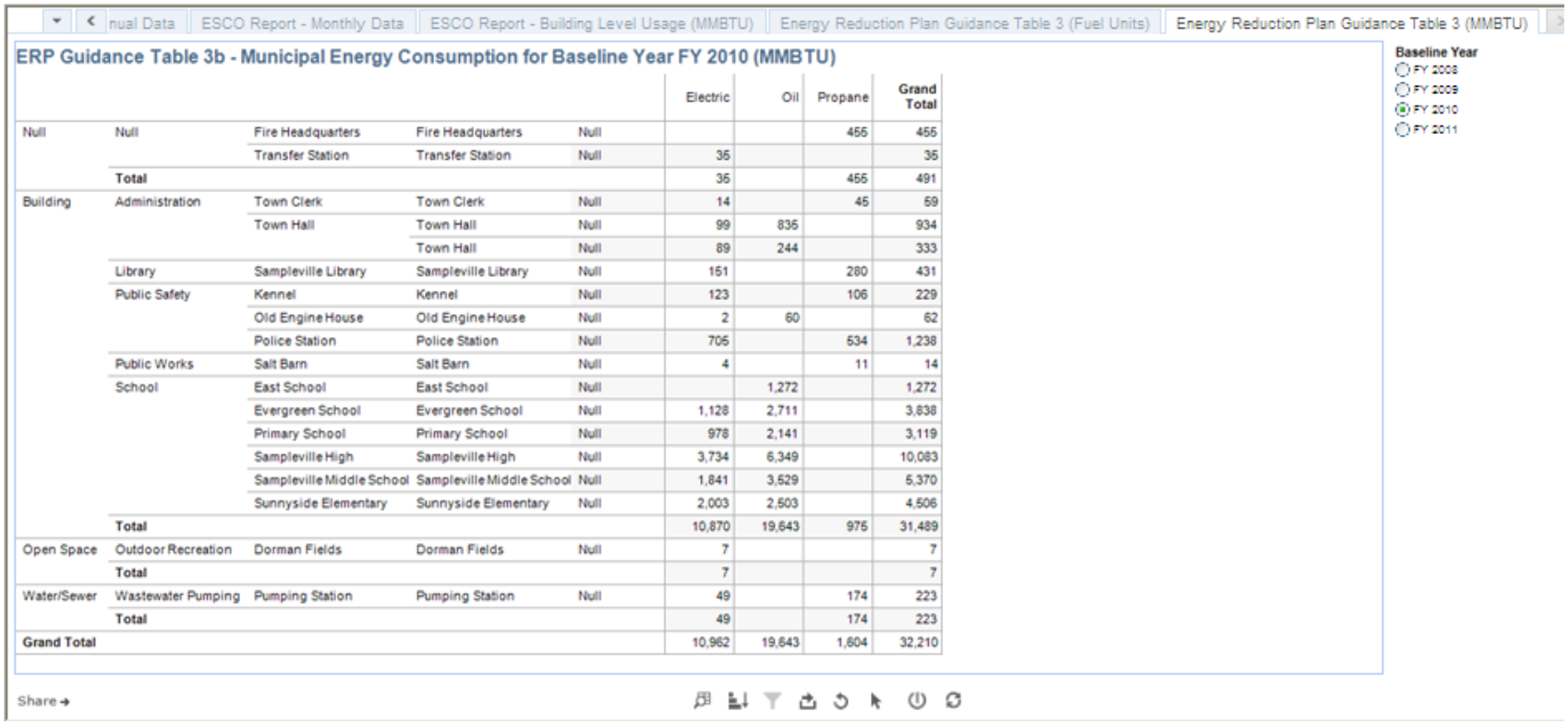


					Electric	Oil	Propane
Null, Null	Fire Headquarters	Fire Headquarters	Null	1567682285			5,003
	Transfer Station	Transfer Station	Null	1074845442	7,335		
				1992993977	3,018		
Null, Total					10,353		5,003
Building, Administration	Town Clerk	Town Clerk	Null	1117058407			498
				1648388286	4,017		
	Town Hall	Town Hall	Null	1246571068	28,946		
				1461354020		6,006	
		Town Hall	Null	1415822192		1,753	
				1824019251	26,117		
Building, Library	Sampleville Library	Sampleville Library	Null	1015344730	44,223		
				1523790017			3,080
Building, Public Safety	Kennel	Kennel	Null	1603449617			1,161
				1632863025	36,186		
	Old Engine House	Old Engine House	Null	1386018066	611		
				1490206650		433	
	Police Station	Police Station	Null	1293870138	144,909		
				1823803701	61,653		
				1957770688			5,863
Building, Public Works	Salt Barn	Salt Barn	Null	1008949322			116
				1678197507	1,106		
Building, School	East School	East School	Null	1227641726		9,152	
	Evergreen School	Evergreen School	Null	1034579667		19,502	

This table shows category and facility energy use by fuel type in their native fuel units. This means that electric use is shown in kWh, natural gas use in therms, and fuel oil, propane, gasoline and diesel use in gallons. It can drill down to the account level.

Energy Reduction Plan Guidance Table 3 (MMBtu)

Use this report to provide the baseline for a Green Communities designation application. Designated Green Communities may use this report to directly file the annual energy use for their Annual Reports with DOER.



					Electric	Oil	Propane	Grand Total
Null	Null	Fire Headquarters	Fire Headquarters	Null			455	455
		Transfer Station	Transfer Station	Null	36			36
	Total				36		455	491
Building	Administration	Town Clerk	Town Clerk	Null	14		45	59
		Town Hall	Town Hall	Null	99	836		934
			Town Hall	Null	89	244		333
	Library	Sampleville Library	Sampleville Library	Null	151		280	431
	Public Safety	Kennel	Kennel	Null	123		106	229
		Old Engine House	Old Engine House	Null	2	60		62
		Police Station	Police Station	Null	705		534	1,238
	Public Works	Salt Barn	Salt Barn	Null	4		11	14
	School	East School	East School	Null		1,272		1,272
		Evergreen School	Evergreen School	Null	1,128	2,711		3,838
		Primary School	Primary School	Null	978	2,141		3,119
		Sampleville High	Sampleville High	Null	3,734	6,349		10,083
		Sampleville Middle School	Sampleville Middle School	Null	1,841	3,529		5,370
		Sunnyside Elementary	Sunnyside Elementary	Null	2,003	2,503		4,506
	Total				10,870	19,643	975	31,489
Open Space	Outdoor Recreation	Dorman Fields	Dorman Fields	Null	7			7
	Total				7			7
Water/Sewer	Wastewater Pumping	Pumping Station	Pumping Station	Null	49		174	223
	Total				49		174	223
Grand Total					10,962	19,643	1,604	32,210

This table shows category and facility energy use by fuel type in MMBtu. It can drill down to the account level.