

# Using the Energy Use Snapshot Report



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## Background

Each project that participates in NYSERDA's Multifamily Performance Program receives an Energy Use Snapshot (EUS) before the project starts implementing energy efficiency measures. The EUS provides the baseline weather-normalized annual energy consumption for the project. After construction has been completed and the measurement and verification period has passed, a second EUS is created. The usage in this post construction EUS is compared to the baseline usage to calculate the achieved energy savings.

Per the MPP Simulation Guidelines, Providers are required to use the weather-normalized Energy Use Snapshot results to calculate the projected percent savings for the project.

If using modeling software, such as TREAT or eQUEST, Providers are required to true-up their model of project energy use to the weather-normalized Snapshot results to ensure that projected savings calculations are reasonable in the context of the baseline EUS. The difference between the annual modeled use and the weather-normalized utility consumption for heating, cooling, and baseload must differ by no more than -10% to 0%. The model cannot show more energy consumption than the weather-normalized utility data. Where variation exceeds -10% to 0%, review the model inputs for anomalies, data entry errors, misinterpretation of performance features, etc. Please note: if using TREAT, the cooling consumption is exempt from this -10% to 0% range because TREAT does not model cooling very well.

## Using Snapshot Data in the SAV-IT

To use the Energy Use Snapshot data in the SAV-IT, the consumption usage shown on the EUS tab called *Normalized Summary – All Fuels* should be pasted into the SAV-IT tab called *Utility Info*, in the column called "Pre-Construction Site MMBtu". Additionally, the breakdown in heating, cooling, and baseload for each fuel should be copied from the Snapshot to the SAV-IT.

The Snapshot data will automatically be incorporated into the SAV-IT table called "Optional Model True-Up Check" on the *Utility Info* tab.

## Using Snapshot Data to True-up a Model

When using TREAT or eQUEST, the weather-normalized EUS data must be used to true-up the model to the building's utility bills. To true-up the model, follow the steps below:

### 1. Copy and paste model outputs:

Copy and paste the outputs of the model into the SAV-IT's "Optional Model True-Up Check" on the *Utility Info* tab. (See examples on the next page.)

**TREAT Models** – The "calculate billing" function in TREAT should not be used, so there is no need to enter any billing data into TREAT. Calculate the model, then copy and paste the modeled heating, cooling, and baseload totals for each fuel from TREAT into the "Optional Model True-Up Check" in the SAV-IT.

**eQUEST Models** – Run the eQUEST BEPU Report. Put the modeled heating, cooling and baseload totals shown in that report for each fuel into the "Optional Model True-Up Check" in the SAV-IT. Be sure to enter the end use consumption under the appropriate "Optional Model True-Up Check" end use.

The following table shows how eQUEST end uses should generally be defined:

eQuest End Use	Snapshot End Use
Lights	Baseload
Task Lights	Baseload
Miscellaneous Equipment	Baseload
Space Heating	Heating
Space Cooling	Cooling
Heat Reject	Cooling
Pumps & Auxiliary*	Baseload
Ventilation Fans*	Baseload
Refrigeration Display	Baseload
Heat Pump Supplemental	Heating
Domestic Hot Water	Baseload
Exterior Usage	Baseload
*Pumps or fans that serve only the heating or cooling system should be categorized with the end use of "Heating" or "Cooling", respectively.	

### 2. Adjust your model

Carefully review your model, make adjustments, then repeat step #1 above until the consumption differs by no more than -10% to 0%, and there are no flags in the "Optional Model True-Up Check". As a reminder, the model must not show more consumption than the bills.

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## Example Using TREAT:

The end uses shown in TREAT (Figure 1) correlate directly to the end uses in the Model True-Up Check (Figure 2).

Calculate Model	Electricity			Natural gas		Fuel 3		More Fuels	
Calculate Billing	Heating, kWh /year	Cooling, kWh /year	Base Load, kWh /year	Heating, therms /year	Base Load, therms /year	Heating, Units/year	Base Load, Units/year	Heating Slope Btu/F-day / sq.ft.	Heating Reference Temperature F.
True Up Help									
Building Model	0.0	64,471.0	286,222.6	39,256.5	15,375.2			16.23	69
Billing Data									
Percent Difference									

Figure 1: TREAT reported consumption.

OPTIONAL Model True-Up Check					
The below table is an <b>optional</b> model true-up check. To use, enter the usage determined by the modeling software (TREAT, eQUEST, etc.) in the appropriate sections. As per the Simulation Guidelines, the difference between the annual modeled use and the actual consumption for heating, cooling, and baseload must differ by no more than -10% to 0%. The model should not show more energy consumption than the bills.					
	Heating	Cooling	Baseload	Total	Units
<b>Electric</b>		64,471	286,223	350,694	kWh/year
% Difference	#DIV/0!	5.61%	2.40%	3.01%	kWh/year
<b>Natural Gas</b>	39,257		15,375	54,632	Therms/year
% Difference	6.71%	#DIV/0!	3.17%	5.74%	Therms/year
<b>Oil</b>					Gallons/year
% Difference	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	Gallons/year
<b>District Steam</b>					kLbs/year
% Difference	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	kLbs/year
<b>Propane</b>					Gallons/year
% Difference	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	Gallons/year

Figure 2: SAV-IT Utility Info tab, Optional Model True-Up Check table.

## Example Using eQuest:

The end uses shown in the eQuest BEPU Report (Figure 3) must be summed before being pasted into the Model True-Up Check (Figure 3).

REPORT- BEPU Building Utility Performance														WEATHER FILE- NEW YORK LAGUARDI NY	
	LIGHTS	TASK LIGHTS	MISC EQUIP	SPACE HEATING	SPACE COOLING	HEAT REJECT	PUMPS & AUX	VENT FANS	REFRIG DISPLAY	HT PUMP SUPPLEM	DOMEST HOT WTR	EXT USAGE	TOTAL		
EM1 ELECTRICITY	272334.	3154.	404757.	259343.	254468.	0.	11.	250251.	0.	37064.	0.	8528.	1489908.		
FM1 NATURAL-GAS THERM	0.	0.	497.	0.	0.	0.	0.	0.	0.	0.	32438.	0.	32935.		

Figure 3: eQuest BEPU report. Make sure to match the units in the BEPU report to the units used in the Optional Model True-Up Check.

OPTIONAL Model True-Up Check					
The below table is an <b>optional</b> model true-up check. To use, enter the usage determined by the modeling software (TREAT, eQUEST, etc.) in the appropriate sections. As per the Simulation Guidelines, the difference between the annual modeled use and the actual consumption for heating, cooling, and baseload must differ by no more than -10% to 0%. The model should not show more energy consumption than the bills.					
	Heating	Cooling	Baseload	Total	Units
<b>Electric</b>	296,407	254,468	939,035		kWh/year
% Difference	1.96%	3.85%	4.76%	100.00%	kWh/year
<b>Natural Gas</b>			32,935		Therms/year
% Difference	#DIV/0!	#DIV/0!	5.66%	100.00%	Therms/year
<b>Oil</b>					Gallons/year
% Difference	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	Gallons/year
<b>District Steam</b>					kLbs/year
% Difference	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	kLbs/year
<b>Propane</b>					Gallons/year
% Difference	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	Gallons/year

Figure 4: SAV-IT Utility Info tab, Optional Model True-Up Check table. Color coded boxes show where data in the Optional Model True-Up Check was found in the BEPU report.

## Snapshot Report FAQs

**Q: Why does the Snapshot for my building show electric heating consumption even though my building does not include any electric heat?**

**A:** If monthly electricity usage at your property increases as monthly winter temperatures get colder – for *any* reason – then this will show up as "heating" in the Snapshot even if there is no electric heating at the property. This typically happens when lights are on for more hours during the darker months and when pump motors run more frequently during colder months.

If your building does not have any electric heating, and electric heating is not modeled, it is permissible to add the Snapshot's electric "heating" consumption to the electric baseload consumption for the purpose of truing up the model. If needed, reach out to the review team to make this update in the *Utility Info* tab so the "Optional Model True-Up Check" is populating correctly.

**Q: Why does the Snapshot report show heating consumption for natural gas even though my building is heated with electricity?**

**A:** The Snapshot report shows a correlation between outdoor temperature and gas use. In most buildings, as it gets colder outside, more energy is used to heat the domestic hot water (DHW). This energy increase is a result of water entering the building at a colder temperature in the winter; it takes more energy to heat the same amount of water across a larger temperature differential.

It is also possible that people use more hot water in the winter via longer or hotter showers/baths. This extra usage shows up in the Energy Use Snapshot in the natural gas heating end use because it is correlated to outdoor temperature (like heating consumption is).

In this case, we would not expect the model to reflect natural gas heating if there is no natural gas heating in the building (for example if the building is heated with electricity or oil but DHW is heated by gas). It is permissible to add the Snapshot's gas "heating" consumption to the gas baseload consumption for the purpose of truing up the model. If needed, reach out to the review team to make this update in the *Utility Info* tab so the "Optional Model True-Up Check" is populating correctly.

**Q: For buildings where the primary heating and cooling are in the same fuel analysis (e.g. an electrically heated building, or a building with an absorption chiller that uses steam from the boiler, or a building with heat pumps), why is the Snapshot baseload higher than what I know it should be? Also, why is the Snapshot's cooling usage less than what I know it should be?**

**A:** The main purpose of the Energy Use Snapshot is to model the total energy usage as accurately as possible from only analyzing utility billing data. The Snapshot can predict this total usage very accurately, even when both heating and cooling are on the same utility meter. However, when both heating and cooling are on the same meter, we do lose accuracy in the allocation of this total usage into the subcategories of heating, cooling and baseload.

In these cases, we typically see the Snapshot showing a predicted baseload that is likely higher than the actual non-heating, non-cooling loads in the building. As a result, the Snapshot also shows smaller total cooling usage compared to the likely actual usage. The cooling usage can be significantly under-predicted when the overstated baseload is borrowing from an already small cooling load (as we see in most New York State multifamily buildings).

The impact on predicted heating usage is insignificant, and often serves to remove some over-predicted heating usage that occurs when the actual baseload is higher in mid-winter compared to during shoulder season months.

For buildings where the heating and cooling systems use the same fuel and where you are calculating savings from improvements to the cooling system, you will sometimes need to model a lower baseload and higher cooling load even if the model then does not match the results given in the Snapshot. Reach out to the Snapshot team if you have questions about a specific project.