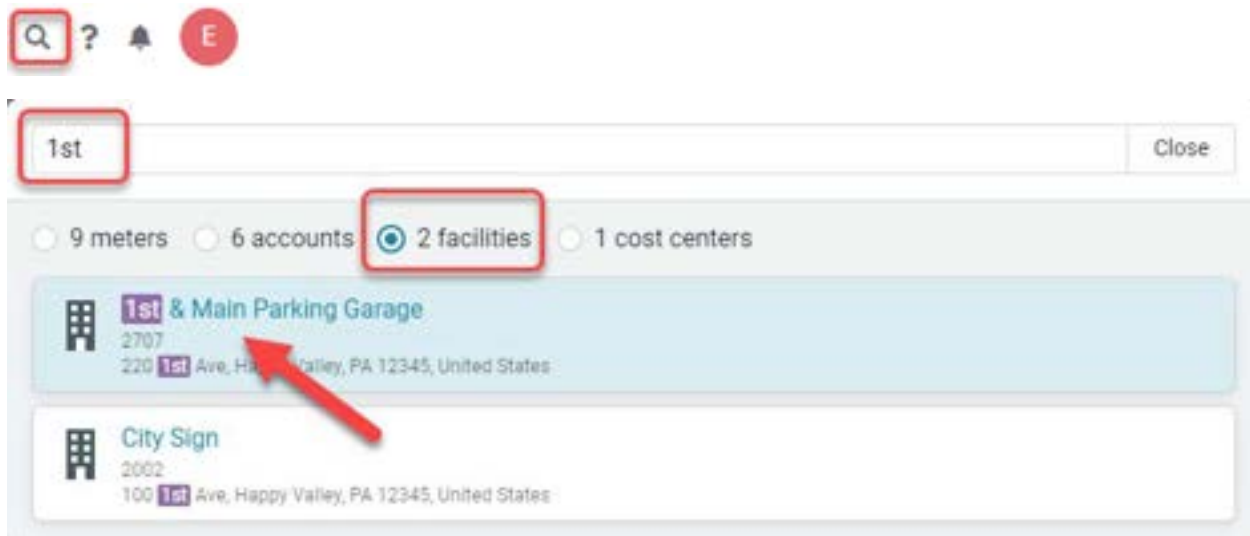


## Step-by-step guide for EnergyCAP Energy Project and Cost Avoidance

This guide documents the process to create and configure an EnergyCAP Energy Project and Cost Avoidance related to an example energy conservation project of a LED Lighting Retrofit.

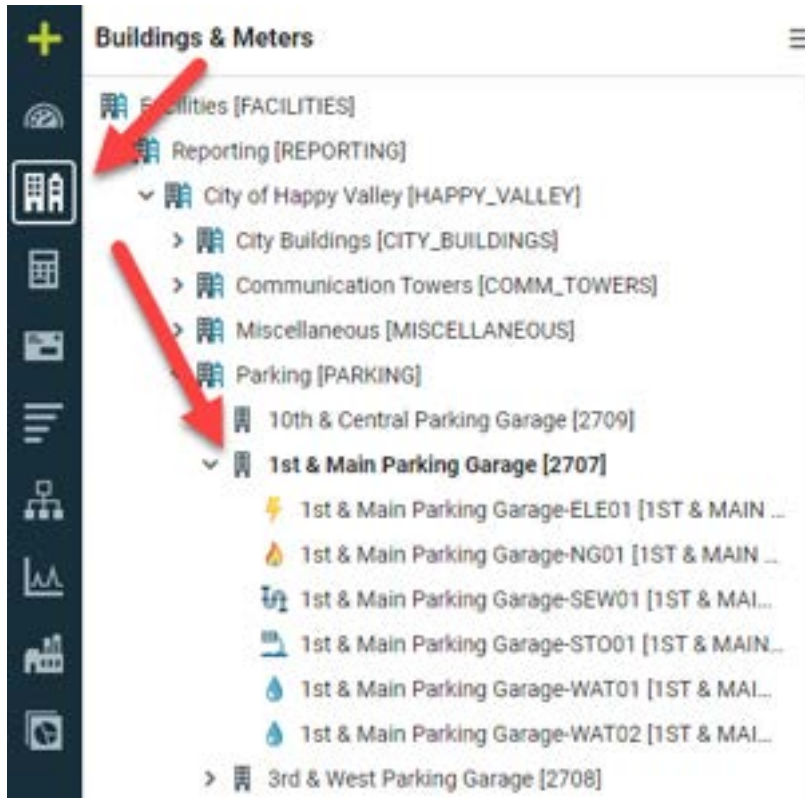
### Energy Project

- Energy Projects are not intended to be a comprehensive management tool, but rather serve to indicate the impact that completed energy conservation projects have on the Building and Organization Energy Use Intensity (EUI).
- In EnergyCAP, either search for the building where the Energy Project is being implemented or navigate to the Buildings & Meters hierarchy and expand to the building.
- To search, click the search icon in the top right corner of EnergyCAP and then enter part of the building number, or name:



- To navigate, click the Buildings & Meters module and expand the carrots to the left of the organizations to drill down to the desired building:

## Step-by-step guide for EnergyCAP Energy Project and Cost Avoidance



- Once the desired building is selected, click on the Energy Projects Tab.



- To create a new Energy Project, click the create (+) button on the right side of the header.



- Enter at least the mandatory information, indicated by a yellow star, and any additional information available, then Save the Energy Project.

## Step-by-step guide for EnergyCAP Energy Project and Cost Avoidance

**Add Energy Project** Cancel Save

--- > HAPPY\_VALLEY [City of Happy Valley] > PARKING [Parking] > 1st & Main Parking Ga...

Name	Cost	Start
<input type="text" value="*"/>	<input type="text"/>	<input type="text" value="MM/DD/YYYY"/>
Short name (used on charts)	Rebate	Completion
<input type="text" value="*"/>	<input type="text"/>	<input type="text" value="MM/DD/YYYY"/>
Type	Cost savings	Funding source
<input type="text" value="* Choose or add"/>	<input type="text"/>	<input type="text"/>
Manager	Energy savings	Memo
<input type="text"/>	<input type="text"/>	<input type="text"/>

- For the Type, select an existing value, or add a new Type by clicking on the create (+) button.

Type

Add New... +

Controls

HVAC Replacement

**Add Energy Project** Cancel Save

--- > HAPPY\_VALLEY [City of Happy Valley] > PARKING [Parking] > 1st & Main Parking Ga...

Name	Cost	Start
<input type="text" value="LED Lighting Retrofit"/>	<input type="text" value="\$ 20,000"/>	<input type="text" value="12/1/2021"/>
Short name (used on charts)	Rebate	Completion
<input type="text" value="LED Lights"/>	<input type="text" value="\$ 5,000"/>	<input type="text" value="3/1/2022"/>
Type	Cost savings	Funding source
<input type="text" value="LED Lighting"/>	<input type="text" value="\$ 36,000"/>	<input type="text" value="Green Grant"/>
Manager	Energy savings	Memo
<input type="text" value="Parker Moore"/>	<input type="text" value="360000"/> <input type="text" value="kWh"/>	<input type="text" value="Brighter Savings"/>

- Energy Projects for the building will be listed.

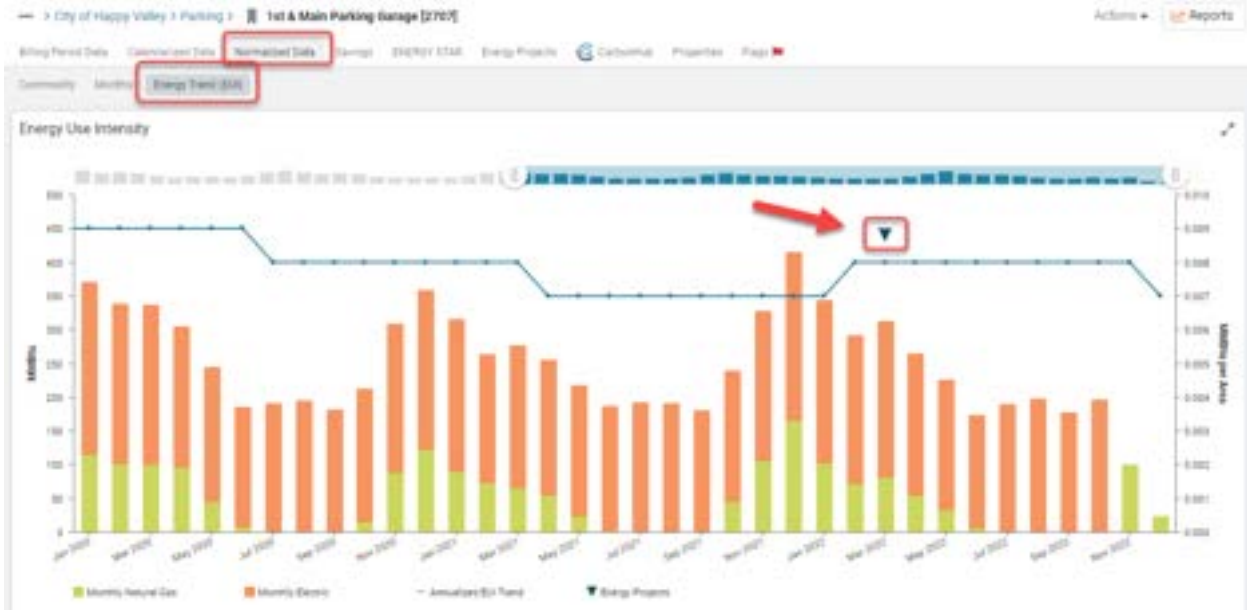
## Step-by-step guide for EnergyCAP Energy Project and Cost Avoidance

City of Happy Valley > Parking > 1st & Main Parking Garage [2707] Actions > Reports

Billing Period Data | Calculated Data | Normalized Data | Savings | ENERGY STAR | Energy Projects | CarbonHub | Properties | Flags

Energy Projects - 1									
Project name	Start	Completion	Project cost	Cost savings	Energy savings	Project Type	Funding source	Project manager	
LED Lights	12/1/2021	03/31/2022	\$ 25,000	\$ 25,000	365,000 kWh	LED Lighting	Green Grant	Peter Moore	1   [edit] [delete]

- When an Energy Project exists for a building and has a completion date, a marker will be added to the EUI chart indicating when the Energy Project should begin impacting the EUI



### Cost Avoidance

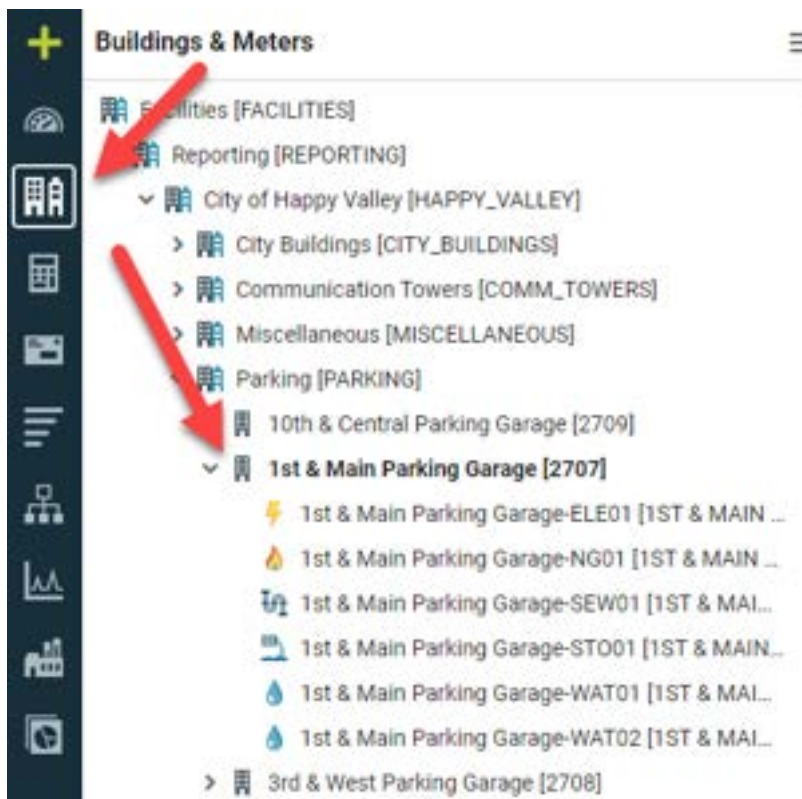
- Cost Avoidance is EnergyCAP's Measurement & Verification (M&V) module and is intended to be a comprehensive management of the avoided costs (savings) attributable to energy conservation projects.
- Cost Avoidance is compliant with the IPMVP, Option C (Whole Building) approach for M&V.
- In EnergyCAP, either search for the building where the Energy Project is being implemented or navigate to the Buildings & Meters hierarchy and expand to the building.
- To search, click the search icon in the top right corner of EnergyCAP and then enter part of the building number, or name:



## Step-by-step guide for EnergyCAP Energy Project and Cost Avoidance



- To navigate, click the Buildings & Meters module and expand the carrots to the left of the organizations to drill down to the desired building:



- Once the desired building is selected, click to expand it to see the meters within the Building.
- Cost Avoidance is calculated at the meter level and it is then rolled up to the building and organizational levels.
- As our example is a LED Lighting Retrofit project, it will have the largest impact on the electric meter.
- Select the electric meter and click on the Savings Tab.

## Step-by-step guide for EnergyCAP Energy Project and Cost Avoidance



- If Cost Avoidance has not been enabled on the selected meter, EnergyCAP will display a welcome screen with some background information.

The screenshot shows a message box titled 'Cost Avoidance is not enabled on this meter'. The message explains that Cost Avoidance is the Measurement and Verification (M&V) of energy and cost savings due to energy management projects and is the dollars that you avoided spending. It also provides a button to 'Enable Cost Avoidance'.

- Click 'Enable Cost Avoidance'
- EnergyCAP will navigate you to the Baseline sub-tab, where the settings are located.
- Review and update the settings, where appropriate.
  - Baseline start – The beginning date of the baseline period before the energy conservation measure is implemented, to establish how the meter is performing.
  - Baseline length – How long is the baseline period?
    - Recommended to be 12 months but can be as long as 36 months.
    - The automatic use vs. weather analysis is turned off for a baseline that is greater than 12 months.
  - Savings start – When should the Savings (Cost Avoidance) begin to be calculated.
    - Generally, corresponds to when the energy conservation measure has been commissioned.



## Step-by-step guide for EnergyCAP Energy Project and Cost Avoidance

- Method – Recommended to use ‘Current Average Unit Cost’.
- Adjust by Floor Area – Recommended to select this option.
  - If the building floor area changes during the savings period, EnergyCAP will automatically adjust the baseline to accommodate the change.
- Pre-baseline years added to weather analysis – Recommended to start with the default of ‘0 years’.
  - Add additional years, if the baseline year was abnormally hot, or cold, to determine a better ‘best-fit’ straight line.
- Cool above – Default setting is 55 degrees F.
  - Adjust the default setting, if the cooling setpoint is known.
- Heat below – Default setting is 55 degrees F.
  - Adjust the default setting, if the heating setpoint is known.
- Once the settings have been updated, click Save & Reprocess.
  - Saves the settings.
  - Reprocesses the baseline and calculates the savings.

Settings Save and Reprocess

Baseline start: 03/01/2018 📅 Baseline length: 12 months ▼

Savings start: 03/01/2022 📅

Method: Current Average Unit Cost ▼

Adjust by Floor Area

Pre-baseline years added to weather analysis: 0 years ▼

Cool above ?: 55°F ▼ Heat below ?: 55°F ▼

[Disable Cost Avoidance](#)

- Review the Use vs. Weather analysis charts and statistics.
  - Rule of Thumb = ‘best-fit’ line rising to the right indicates the meter is weather sensitive.
  - The goal is to have the ‘best-fit’ line predict consumption, based on degree day weather data, with a statistical confidence of 95%, or greater.
  - EnergyCAP lists the statistical measurements and hovering over the question mark opens a text bubble explanation.

## Step-by-step guide for EnergyCAP Energy Project and Cost Avoidance



- Add any Special Adjustments, as warranted. They should meet all of the below criteria.



A special adjustment is needed if there has been a change in the energy use of a building meeting these conditions:

- It occurred AFTER the baseline year
- It is NOT the result of an Energy Manager's actions
- It is NOT weather related

Such uncontrollable conditions, if left unadjusted, can unfairly make the energy management results appear better or worse than reasonable.

[+ Add Special Adjustments](#)



## Step-by-step guide for EnergyCAP Energy Project and Cost Avoidance

The screenshot shows the 'Add Special Adjustment' form with the following fields and options:

- Category:** A dropdown menu with a yellow star icon and the text 'Choose'.
- Method:** A dropdown menu with a yellow star icon and the text 'Choose'.
- Adjustment value:** A text input field with a yellow star icon.
- Start:** A date input field with a yellow star icon and the placeholder 'MM/DD/YYYY'.
- End:** A date input field with a yellow star icon and the placeholder 'MM/DD/YYYY'.
- Frequency:** Two radio buttons: 'continuous' (selected) and 'recurring'.
- Description:** A text input field with a yellow star icon.

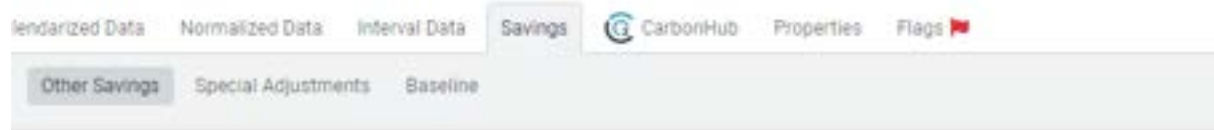
- Enter the mandatory values, above, then Save.

The screenshot shows the 'Add Special Adjustment' form with the following values entered:

- Category:** Special Event
- Method:** Add X.XXXX per day to the BATCC non-weather use
- Adjustment value:** 900.0
- Start:** 3/16/2022
- End:** 3/18/2022
- Frequency:** continuous
- Description:** Hosting a St. Patrick's Day event

## Step-by-step guide for EnergyCAP Energy Project and Cost Avoidance

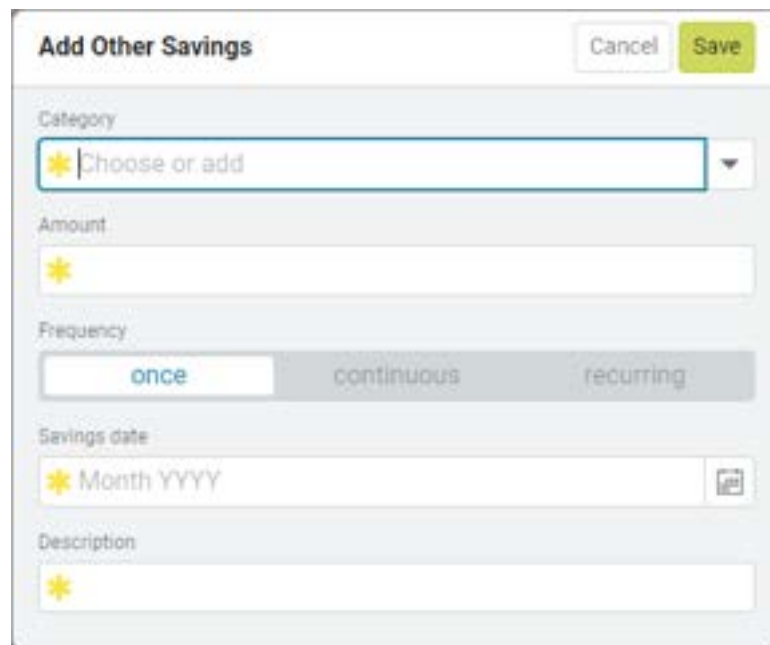
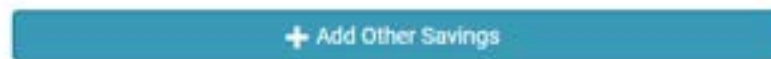
- Add any Other Savings, as warranted.



Other Savings are one-time or recurring cost reductions that don't fit within the normal cost avoidance calculations of today's bills vs. baseline bills. However, they are valid savings attributable to energy management activities.

Examples:

- A rebate or refund negotiated with a vendor
- A lower cost rate schedule/tariff
- Savings in personnel, equipment, supplies, or maintenance due to reduced runtimes of lighting, HVAC and other equipment
- Savings due to consolidation of accounts, meters, or operations
- Eliminated capital expenditures due to lower loads and runtimes

A screenshot of the 'Add Other Savings' form. The form has a title 'Add Other Savings' and two buttons: 'Cancel' and 'Save'. The form contains several fields: 'Category' with a dropdown menu showing 'Choose or add'; 'Amount' with a text input field; 'Frequency' with three radio buttons: 'once' (selected), 'continuous', and 'recurring'; 'Savings date' with a text input field showing 'Month YYYY' and a calendar icon; and 'Description' with a text input field. Each input field has a yellow star icon on the left, indicating it is a mandatory field.

- Enter the mandatory values, above, then Save.

## Step-by-step guide for EnergyCAP Energy Project and Cost Avoidance

**Add Other Savings** Cancel Save

Category  
Rebate

Amount  
\$ 5,000

Frequency  
 once  continuous  recurring

Savings date  
Mar 2022

Description  
Rebate for LED Lighting Retrofit

- If you have added any Special Adjustments, or Other Savings, run the Cost Avoidance processor to recalculate the savings.
  - Navigate to the Buildings & Meters module menu.
  - Select the Cost Avoidance Calculations option.

**Buildings & Meters** ☰ \*\*\* > Parking > 1st & Main Pa

Facilities [FACILITIES]

Reporting [REPORTING]

City of Happy Valley [HAPPY\_VALLEY]

- City Buildings [CITY\_BUILDINGS]
- Communication Towers [COMM\_TOWERS]
- Miscellaneous [MISCELLANEOUS]

Parking [PARKING]

- 10th & Central Parking Garage [2709]
- 1st & Main Parking Garage [2707]
  - 1st & Main Parking Garage-ELE01 [1ST & MAI...]
  - 1st & Main Parking Garage-NG01 [1ST & MAIN ...]
  - 1st & Main Parking Garage-SEW01 [1ST & MAI...]
  - 1st & Main Parking Garage-STO01 [1ST & MAIN...]
  - 1st & Main Parking Garage-WAT01 [1ST & MAL...]
  - 1st & Main Parking Garage-WAT02 [1ST & MAL...]
- 3rd & West Parking Garage [2708]
- 4th & Walnut Parking Garage [2699]

CARBONHUB

- Update GHG for Existing Meters
- Custom GHG Factors
- New Meter Defaults
- Scope Category Information

COST AVOIDANCE

- Cost Avoidance Calculations**
- New Meter Defaults
- Average Unit Cost (AUC) Range

SERVICES AND TOOLS

- Interval Data Import
- Interval Data Import Formats
- Budget Worksheet

ENERGY STAR

- Settings
- Submit to ENERGY STAR

## Step-by-step guide for EnergyCAP Energy Project and Cost Avoidance

- Review the list of Cost Avoidance Calculations
  - If the action of adding a Special Adjustment, or Other Savings, is listed and “savings recalculated”, click Done.
  - Otherwise, click Calculate Savings.

Cost Avoidance Calculations

Date	Description	Status	Type	Success	Warnings	Errors	Status
12/21/2021	Other savings available for a meter (savings recalculated)	Complete	Savings	2	2	0	Complete
12/21/2021	Special adjustment applied to a meter (savings recalculated)	Complete	Special Savings	1	0	0	Complete
12/21/2021	Special adjustment applied to a meter (savings recalculated)	Complete	Special Savings	1	0	0	Complete
12/21/2021	Other savings available for a meter (savings recalculated)	Complete	Savings	2	2	0	Complete
12/21/2021	Special adjustment applied to a meter (savings recalculated)	Complete	Special Savings	1	0	0	Complete

- If Calculate Savings, review the settings.
  - Recommend using a filter, such as Topmost Place Name, if the Cost Avoidance calculations should be for a specific building, or branch of the Buildings & Meters hierarchy.
  - If Calculating Savings without any filters, only meters accessible to your EnergyCAP User will have their Cost Avoidance calculated.

Calculate Savings

Cancel Calculate

Bills to process  
Bills that are not processed or have been modified

Special adjustment category to ignore  
None

Filters

Building Group Name  
Commodity Name  
Meter Group Name  
Topmost Place Code  
✓ Topmost Place Name

Topmost Place Name equals 1st & Main Parking Garage

2 meters will be updated

?

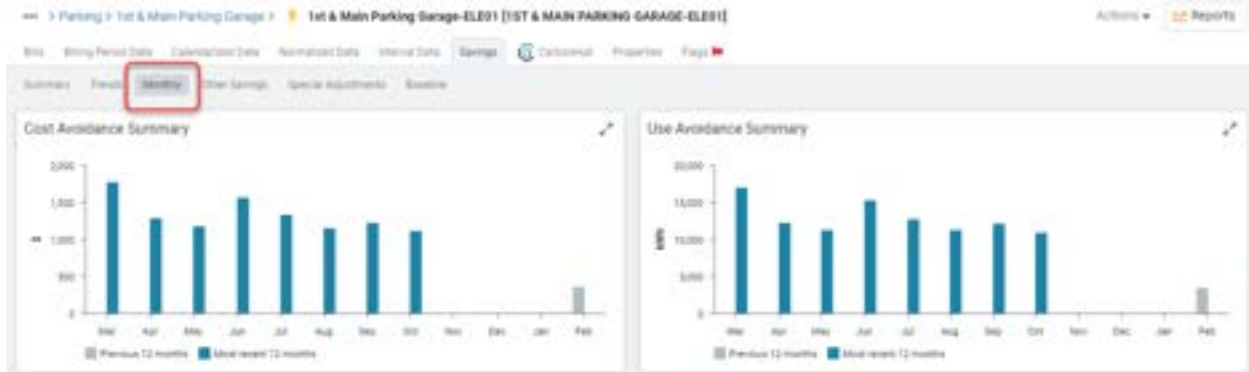
- Calculate Savings will run in the background, so you may click Done to exit, or you could wait for the status to equal complete, prior to clicking Done.

Calculate Savings Reprocess Baseline and Savings Done

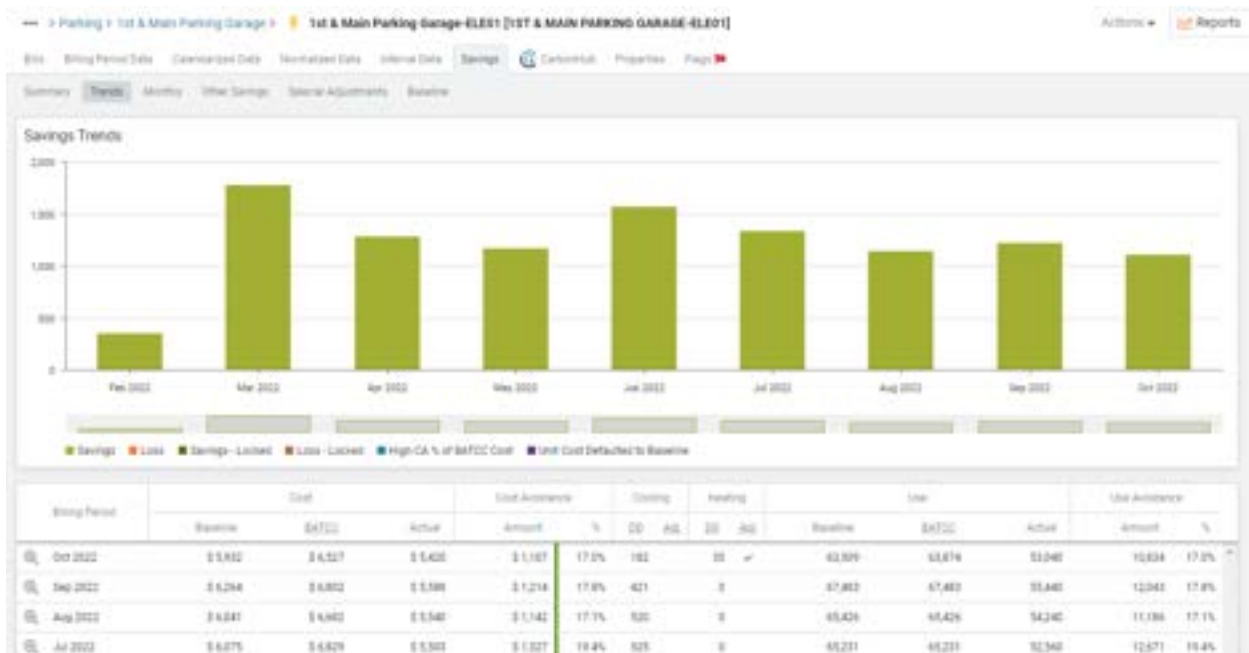
Type	Success	Warnings	Errors	Status
Savings	2	2	0	Complete
Savings	1	0	0	Complete

## Step-by-step guide for EnergyCAP Energy Project and Cost Avoidance

- Review the PowerViews to reassure that they make sense.
  - Monthly

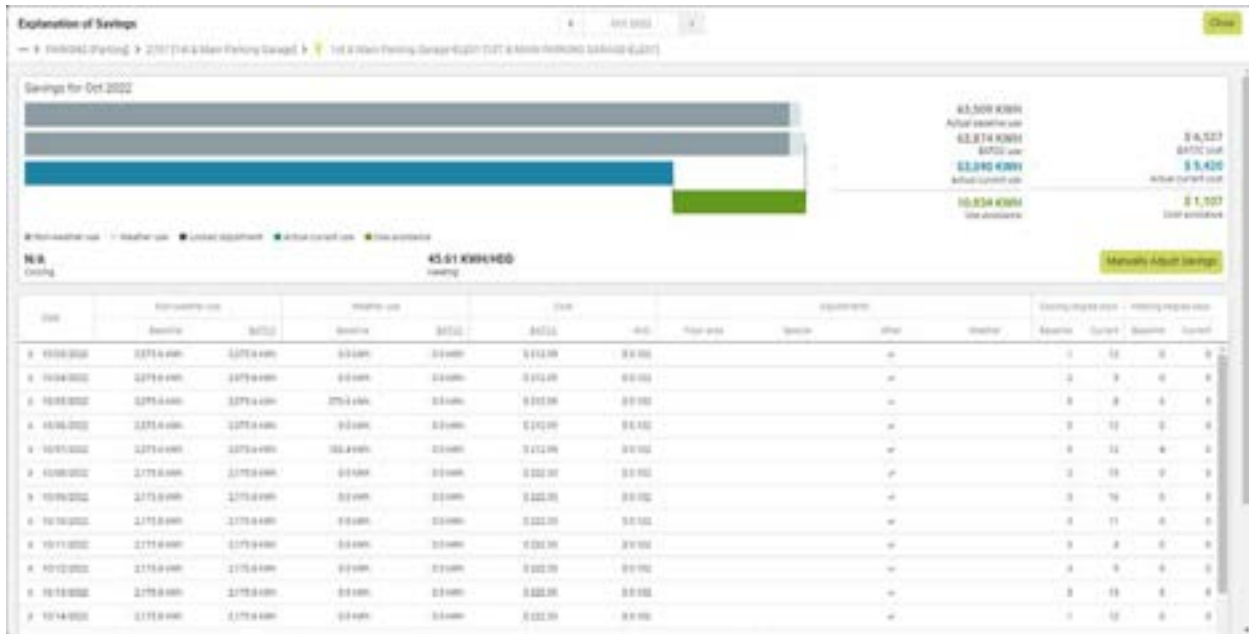


- Trends

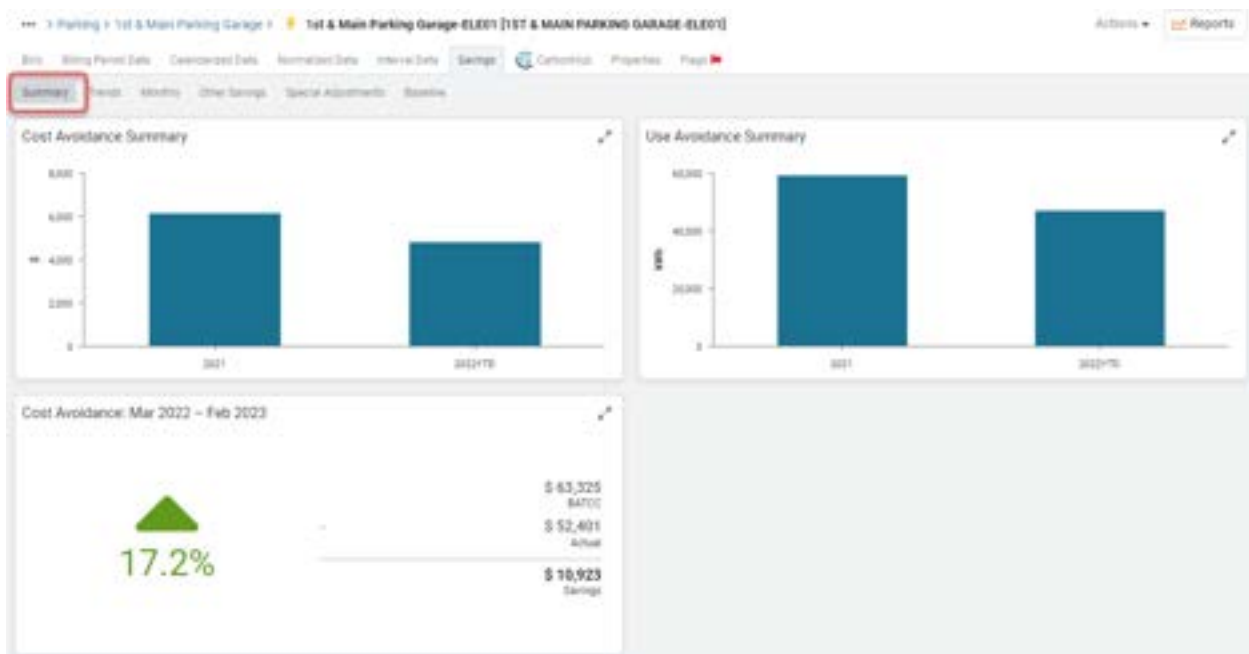


- Click on one of the bars in the graph, or the magnifying glass on the left side of the table, to view the Savings Details for a month.
  - BATCC is the Baseline Adjusted to Current Conditions (Adjusted Baseline)

## Step-by-step guide for EnergyCAP Energy Project and Cost Avoidance



- When you have completed the review of the Explanation of Savings, click Close.
- Summary



- Savings calculations for the Building and Organizational levels will be rolled up overnight and reflected in the PowerViews and Reports the next day.
- Reporting
  - Report-14 Cost Avoidance
  - Report-23 Energy Conservation Program
  - Report-24 Cost Avoidance Summary



## Step-by-step guide for EnergyCAP Energy Project and Cost Avoidance



TN Happy Valley

Report-14 - Cost Avoidance

### Cost Avoidance by Building

	BATCC Cost	Actual Cost	Cost Avoidance	Cost Avoidance %
1st & Main Parking Garage [2707]	\$26,840	\$22,050	\$4,790	17.8%
3rd & West Parking Garage [2708]	\$2,249	\$2,249	\$0	0.0%
4th & Walnut Parking Garage [2699]	\$186	\$186	\$0	0.0%
10th & Central Parking Garage [2709]	\$9,916	\$9,916	\$0	0.0%
Welch Pool Parking Garage [2711]	\$448	\$448	\$0	0.0%
<b>Total</b>	<b>\$39,640</b>	<b>\$34,850</b>	<b>\$4,790</b>	<b>12.1%</b>

# Step-by-step guide for EnergyCAP Energy Project and Cost Avoidance



TN Happy Valley

Report-23 - Energy Conservation Program Results

## Executive Summary (MMBtu)

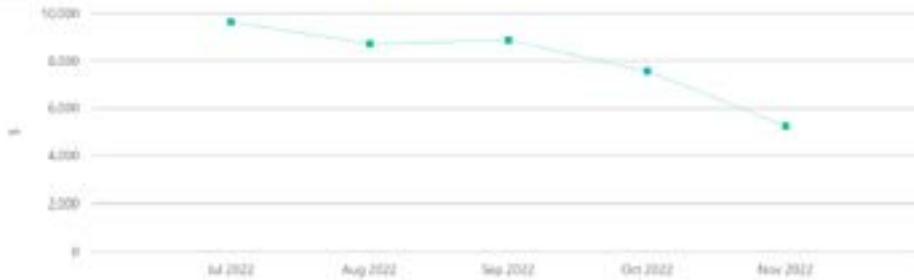
Cumulative Cost Savings Billing Period equals Fiscal year-to-date (excludes current)

Expected Cost	\$177,003
Actual Cost	\$136,948
Program Savings	\$40,056
Percent Savings	22.6%
Other Savings	\$3,750
Total Savings	\$43,806



Expected Energy Cost	Actual Energy Cost	Program Savings
Anticipated expense without energy management.	Actual utility costs for electricity, gas, water, sewer, etc. obtained directly from bills.	The difference between Expected and Actual Cost, calculated in accordance with the International Performance Measurement & Verification Protocol and ISO 50015. Does not include savings attributable to reduced equipment maintenance and replacement costs and other collateral benefits. These savings can increase the program savings up to 20%.
Base year usage after adjustments for such variables as changes in weather, equipment, schedules, occupancy and prices.	<b>Other Savings</b> Additional documented savings attributable to Program activities but not the direct result of usage reductions, such as rebates, refunds, tariff changes, etc.	

### Monthly Cost Savings

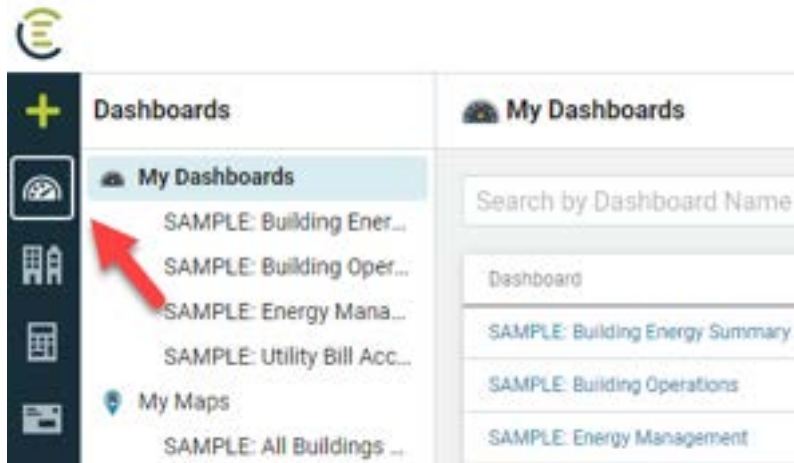


### Cumulative Greenhouse Gas Reduction

Energy Reduction Impact: 1,561 MMBtu	141 equiv. metric tons of CO <sub>2</sub>
This is equivalent to the following:	
Passenger cars not driven for one year:	29
Tree seedlings grown for 10 years:	3,609

- Dashboard
  - Navigate to the EnergyCAP Dashboards Module

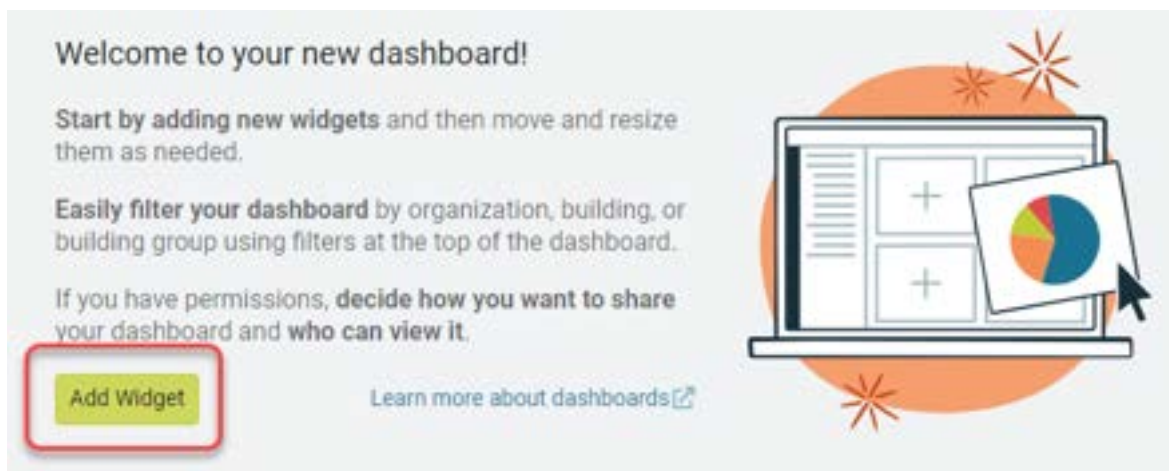
## Step-by-step guide for EnergyCAP Energy Project and Cost Avoidance



- Select 'My Dashboards'
- Click 'Add Dashboard'
- Enter a Title and a Description, then Save.

The screenshot shows the 'Add Dashboard' form. At the top left, the title 'Add Dashboard' is displayed. To the right of the title are 'Cancel' and 'Save' buttons. Below the title, there are two input fields: 'Title' and 'Description'. The 'Title' field contains the text 'Energy Use Intensity & Savings'. The 'Description' field contains the text 'EUI and Savings Overview'.

- Click 'Add Widget'



- Either scroll to review the available widgets, or type 'energy' into the search box
- Click 'Add' for the 'Energy Use Intensity' widget

## Step-by-step guide for EnergyCAP Energy Project and Cost Avoidance

**Add Widget** Cancel

Search by name or keyword:  Object:  Display type:  Data Type:

**Energy Use Intensity**  
Bar chart of total commodity use by month with a trend line that compares energy use to facility size to determine efficiency. Add

**Multiple ENERGY STAR Buildings**  
Add multiple buildings to view the latest ENERGY STAR score and EUI in a single table. Add

**Single ENERGY STAR Building**  
View the latest ENERGY STAR score and trend chart of a selected building. Add

- Enter a Title, a description, and apply appropriate filters. Then Save.

**Add Energy Use Intensity Widget** Cancel Save

Title:

Description:

Search filters: Last N Years:  equals

**Recommended**

- Building Group
- Topmost Place Code
- Topmost Place Name

- Use 'Add Widget' in the top right corner to add additional content, such as the 'Cost Avoidance Savings' widget

## Step-by-step guide for EnergyCAP Energy Project and Cost Avoidance

**Add Widget** Cancel

Search by name or keyword

Object: All Objects | Display type: All Display Types | Data Type: All Data Types

**Cost Avoidance Savings** (highlighted)  
Your organization's total MSV cost savings are shown as a percentage and dollar amount. Cost savings is calculated by comparing actual cost to the Baseline Adjusted to Current Conditions (BATCC).

**Add Cost Avoidance Savings Widget** Cancel Save

Title: Savings

Description: Cost Avoidance realized from energy conservation projects.

Search filters:

- Recommended**
  - Building Group
  - Topmost Place Code
  - Topmost Place Name
- Optional**
  - Commodity Name

- And the 'Cost Avoidance Trend' widget

## Step-by-step guide for EnergyCAP Energy Project and Cost Avoidance

**Add Widget** Cancel

Search by name or keyword

Object: **All Objects** | Display type: **All Display Types** | Data Type: **All Data Types**

**Cost Avoidance By Commodity**  
Cost Avoidance results by commodity for a selected time period.  
Add

**Cost Avoidance Savings**  
Your organization's total MSV cost savings are shown as a percentage and dollar amount. Cost savings is calculated by comparing actual cost to the Baseline Adjusted to Current Conditions (BATCC).  
Add

**Cost Avoidance Savings By Year**  
Bar chart displaying Cost Avoidance by commodity and year. Can also be filtered by commodity.  
Add

**Cost Avoidance Trend**  
A line chart of monthly data across years showing Cost Avoidance results.  
Add

**Add Cost Avoidance Trend Widget** Cancel Save

Title:

Description:

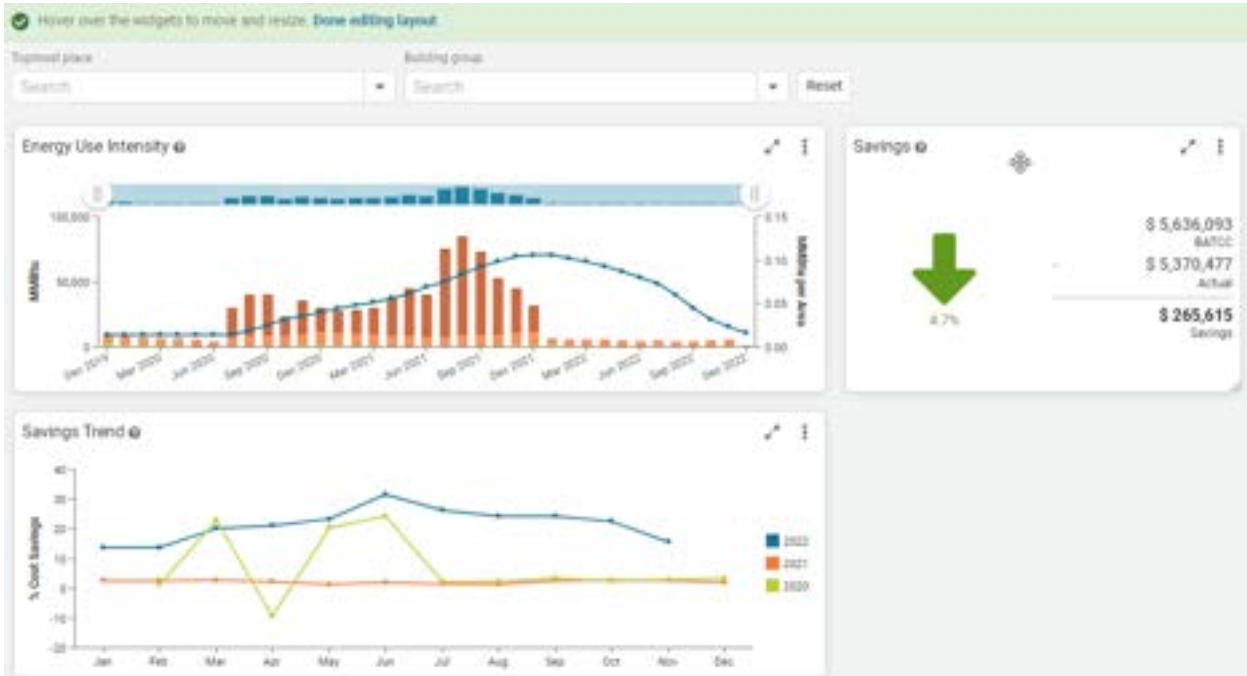
Search filters

<b>Recommended</b>	Number of Years <input type="text" value="3"/> equals <input type="text" value="3"/>
<input type="checkbox"/> Building Group	
<input type="checkbox"/> Topmost Place Code	
<input type="checkbox"/> Topmost Place Name	
<b>Optional</b>	
<input checked="" type="checkbox"/> Number of Years	

- Hover over the widgets to move and resize.
- When you like the Dashboard presentation, click 'Done editing layout'



## Step-by-step guide for EnergyCAP Energy Project and Cost Avoidance



- In the current form, the Dashboard displays data for the entire portion of the Organization that your EnergyCAP User has access to.
- Use the Topmost Place and/or Building Group to focus on particular Buildings or branches of the organizational hierarchy. All Dashboard widgets will have this filter applied. For example:

