

# CATALYST

## Your data, your way



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EnergyCAP



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Chief Product & Tech Officer  
EnergyCAP





# Agenda

- Bringing utility bills & real-time interval data together
- Energy procurement
- Demand management
- Bill reconciliation
- Advanced energy management
- Powerful dashboards

# Value Areas of Both Applications

## EnergyCAP UtilityManagement

- Monthly and yearly
- Detailed bill analysis and bill workflow
- Portfolio-level and aggregate rollups, common and global UOM
- Looking at the rear view, take action to correct for the future
- Focus on reporting, quick summaries, getting answers quickly

## EnergyCAP SmartAnalytics (Wattics)

- Minutely, hourly, daily, monthly, yearly
- Advanced views of interval and time series data
- Point and meter tracking, equipment or zone areas
- Actionable now so don't have surprises in the future
- Focus on analytics, simulations, what ifs, verifying performance

Might not be the same team members using each!

# SmartAnalytics // Real-time energy and sustainability analytics

## Capture

Capture real-time data from virtually any source and type of device.

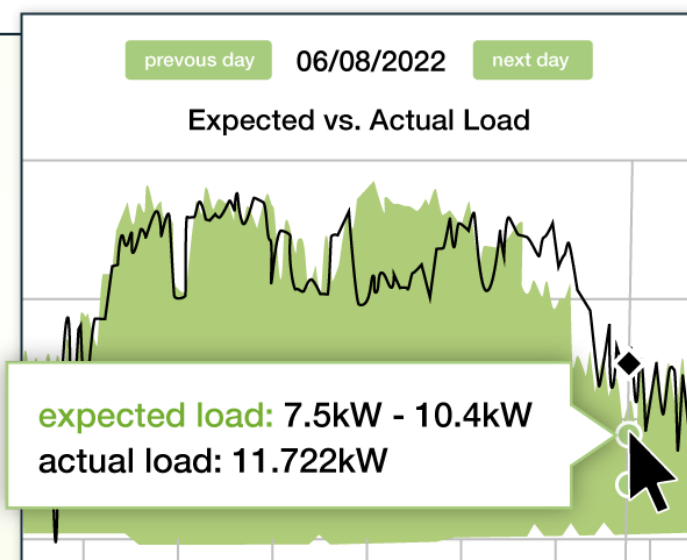
**Hierarchy**

**Groups**

- Science Center
  - Air quality
  - Air handler
  - Boiler
  - Water
  - Chiller
  - Production output (generic)
  - Pump**
  - Solar
  - EV charger
  - Daily visitors

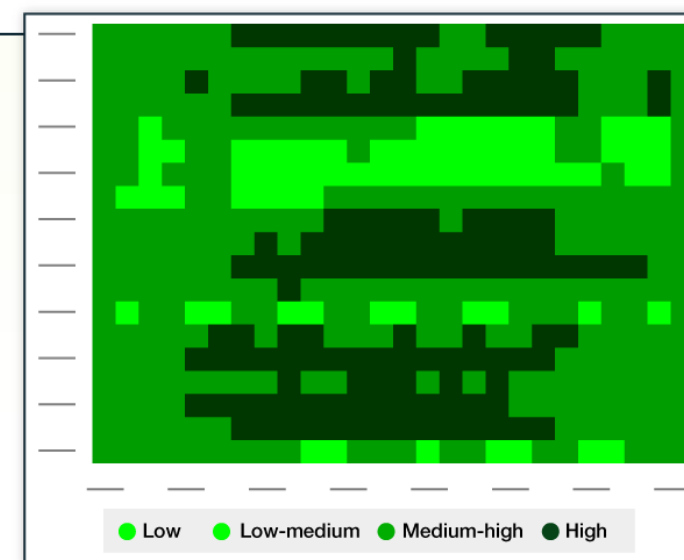
## Monitor

Monitor data quality, detect outliers, and receive alerts and alarms.



## Analyze

Access robust analysis and reporting functionality.























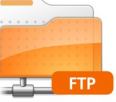









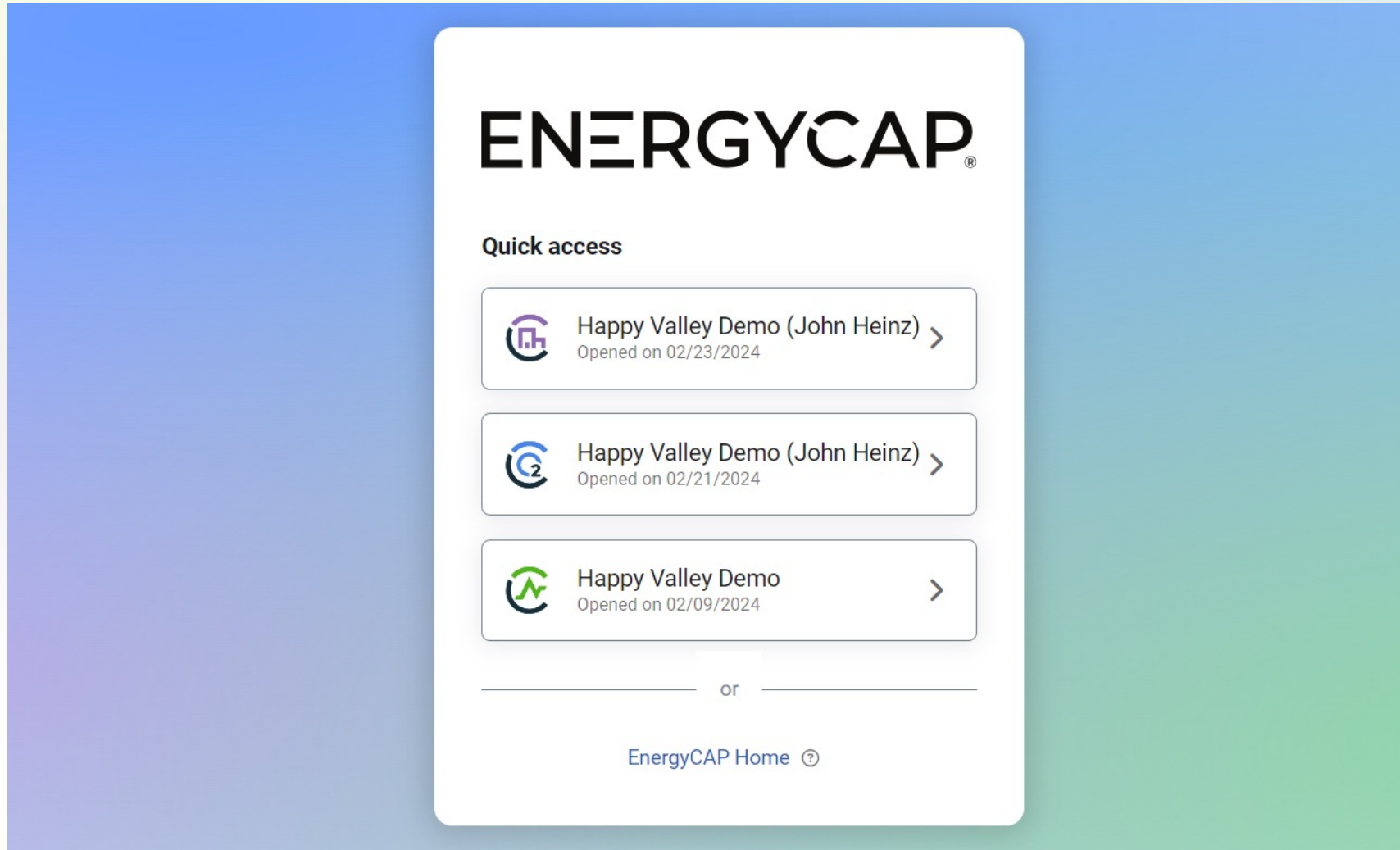
# SmartAnalytics // Real-time energy and sustainability analytics

- API
- Data systems
- Files
- Gateways
- Meters
- Sensors
- Solar and PV
- Third-Party Integrations
- Utility Companies - UIDI

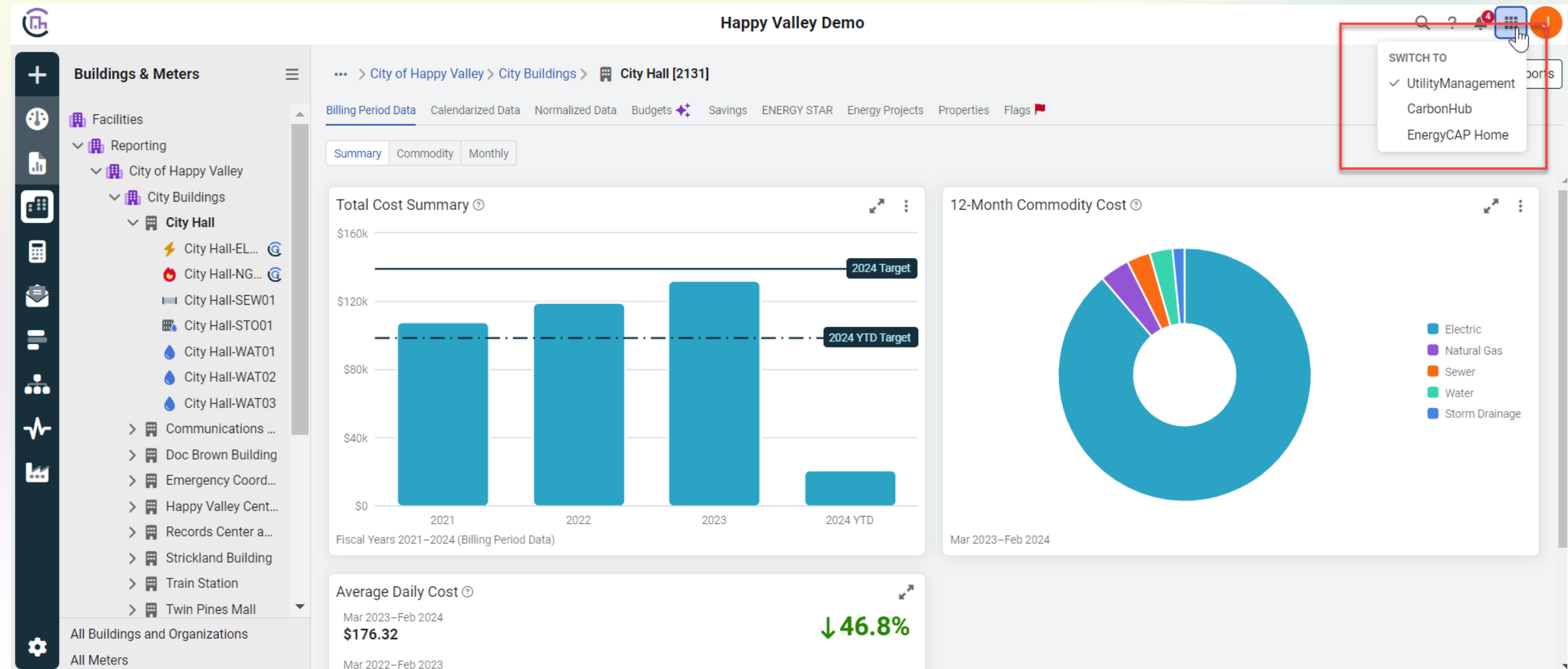
## Connected devices and systems

 <p>5-step guide to install and connect your Wattwatchers device to Wattics energy management software</p> <p>THIRD-PARTY INTEGRATIONS</p>	 <p>Accuenergy AcuLink 710 via HTTP</p> <p>GATEWAYS</p>	 <p>Accuenergy AcuREV20XX Meters via HTTP</p> <p>METERS</p>	 <p>Connect your Elvaco CMe3100 gateway to Wattics energy and air analytics software</p> <p>GATEWAYS</p>	 <p>Connect your EpiSensor gateway and sensors to Wattics</p> <p>THIRD-PARTY INTEGRATIONS</p>	 <p>Connect your Schneider Com'X Gateway to Wattics via API</p> <p>GATEWAYS</p>	 <p>Plateforme ENGIE</p> <p>DATA SYSTEMS</p>	 <p>Questionnaire: Determining your metering needs and project environment</p> <p>METERS</p>	 <p>Rainforest Eagle Gateway via HTTPS</p> <p>GATEWAYS</p>	 <p>Use your Accuenergy AcuRev 2020 or Acuvim II meter as a gateway for pulse capable meters</p> <p>METERS</p>
 <p>Accuenergy AcuVIM-II via HTTP</p> <p>METERS</p>	 <p>Analytics REST API</p> <p>API</p>	 <p>Aquametro CONTOIL VZO 4 / 8 via Octopus Gateway</p> <p>METERS</p>	 <p>Carlo Gavazzi EM21 via Octopus Gateway</p> <p>METERS</p>	 <p>Carlo Gavazzi VMU-C EM via FTP</p> <p>GATEWAYS</p>	 <p>Connect your building devices to Wattics via MQTT</p> <p>THIRD-PARTY INTEGRATIONS</p>	 <p>Landis Gyr ULTRAHEAT T550 (UC50) via Octopus Gateway</p> <p>METERS</p>	 <p>Northern Design Rali 350 Meters via Octopus Gateway</p> <p>METERS</p>	 <p>Omron KM-NI-FLK via Octopus Gateway</p> <p>METERS</p>	 <p>SolarEdge API</p> <p>THIRD-PARTY INTEGRATIONS</p>
 <p>Connect your Shelly 3EM 3-phase meter to the Wattics energy management dashboard</p> <p>METERS</p>	 <p>Eaton PXM 2000 Meters via Octopus Gateway</p> <p>METERS</p>	 <p>eGauge via HTTP</p> <p>METERS</p>	 <p>How to connect your Wattsense box to Wattics cloud based energy analytics software</p> <p>GATEWAYS</p>	 <p>Integrate your Kaiterra Air Quality sensors with Wattics energy management [How to guide]</p> <p>SENSORS</p>	 <p>Integrate your Snapsee device with Wattics Energy Management Software</p> <p>THIRD-PARTY INTEGRATIONS</p>	 <p>REST API - Smart Meter Energy Data API</p> <p>API</p>	 <p>Schneider PowerLogic EX300 Gateway via FTP</p> <p>GATEWAYS</p>	 <p>Schneider PowerLogic PM8000 meter via Obvius AcquiSuite EMB A8810 Gateway</p> <p>METERS</p>	 <p>Upload your data in CSV with data uploader in Wattics dashboard</p> <p>FILES</p>
 <p>EIG Nexus 1500 Meter via Obvius AcquiSuite EMB A8810 Gateway</p> <p>METERS</p>	 <p>Get your energy data to Wattics via FTP</p> <p>FILES</p>	 <p>GreenButton XML</p> <p>FILES</p>	 <p>Iskraemeco Mx382 GPRS via HES</p> <p>METERS</p>	 <p>Itron Gas Volume Converter CORUS (PTZ) via Octopus Gateway</p> <p>METERS</p>	 <p>Klik 22 Electrical Meters via Octopus Gateway</p> <p>METERS</p>	 <p>Schneider TAC Xenta 411 via Octopus Gateway</p> <p>GATEWAYS</p>	 <p>Send your data to Wattics effortlessly with email parser BOT</p> <p>FILES</p>	 <p>Socomec Diris G via FTP</p> <p>GATEWAYS</p>	 <p>Step-by-step-guide: How to connect your Wattics energy management dashboard to Arc green building scoring platform</p> <p>THIRD-PARTY INTEGRATIONS</p>

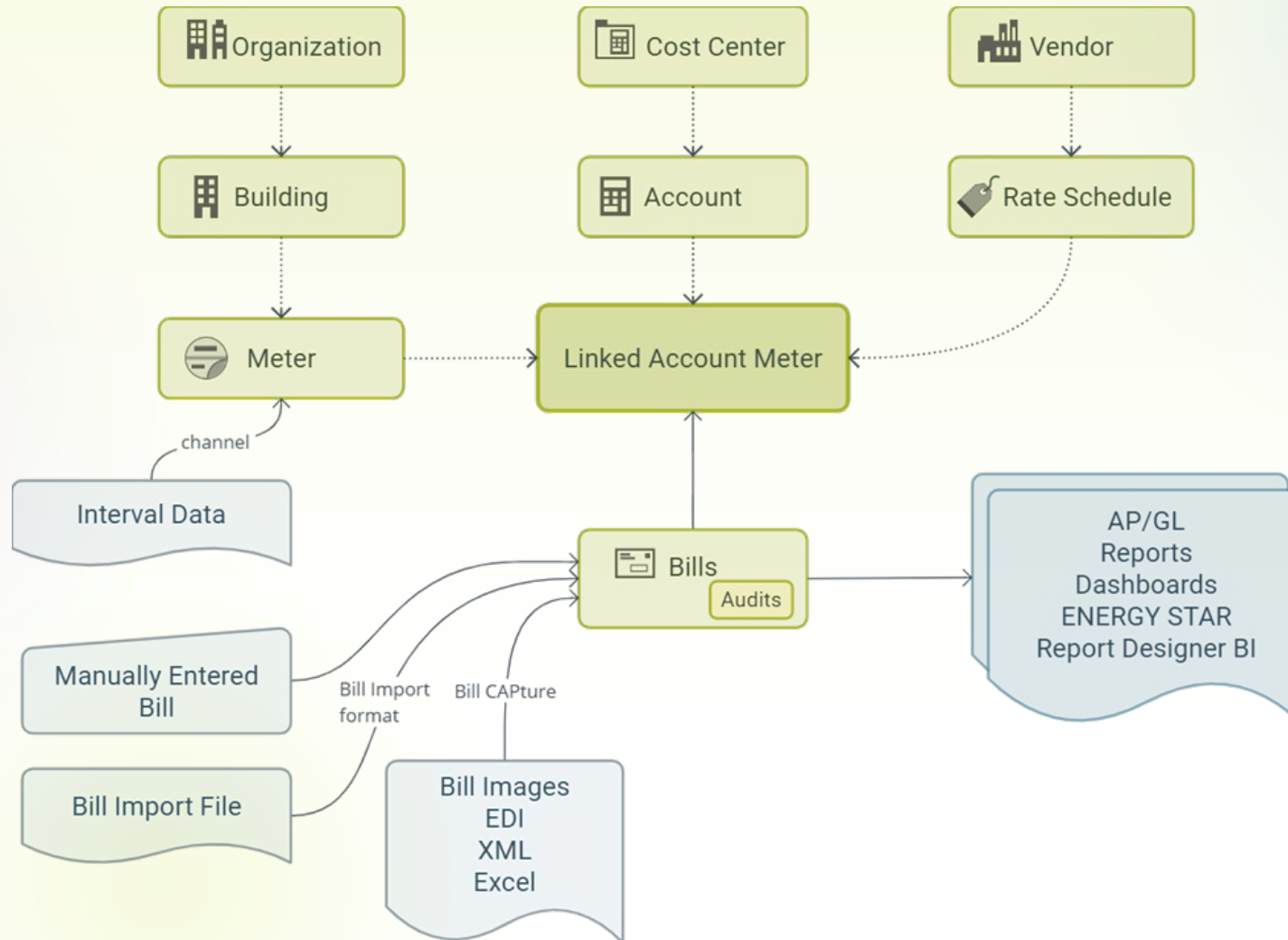
# Single Login - Access All Applications



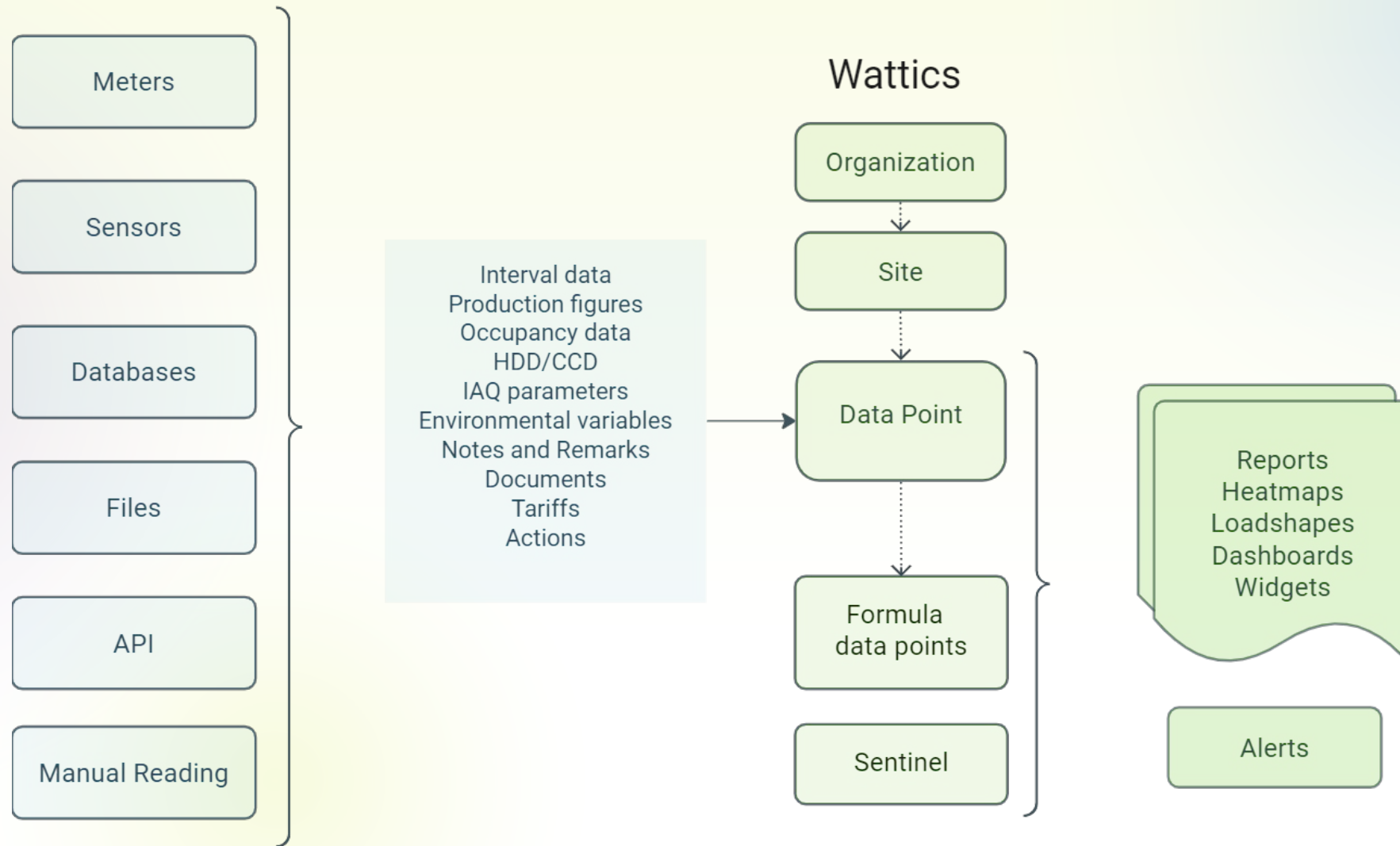
# Single Login - Access All Applications



# Data Elements // UtilityManagement

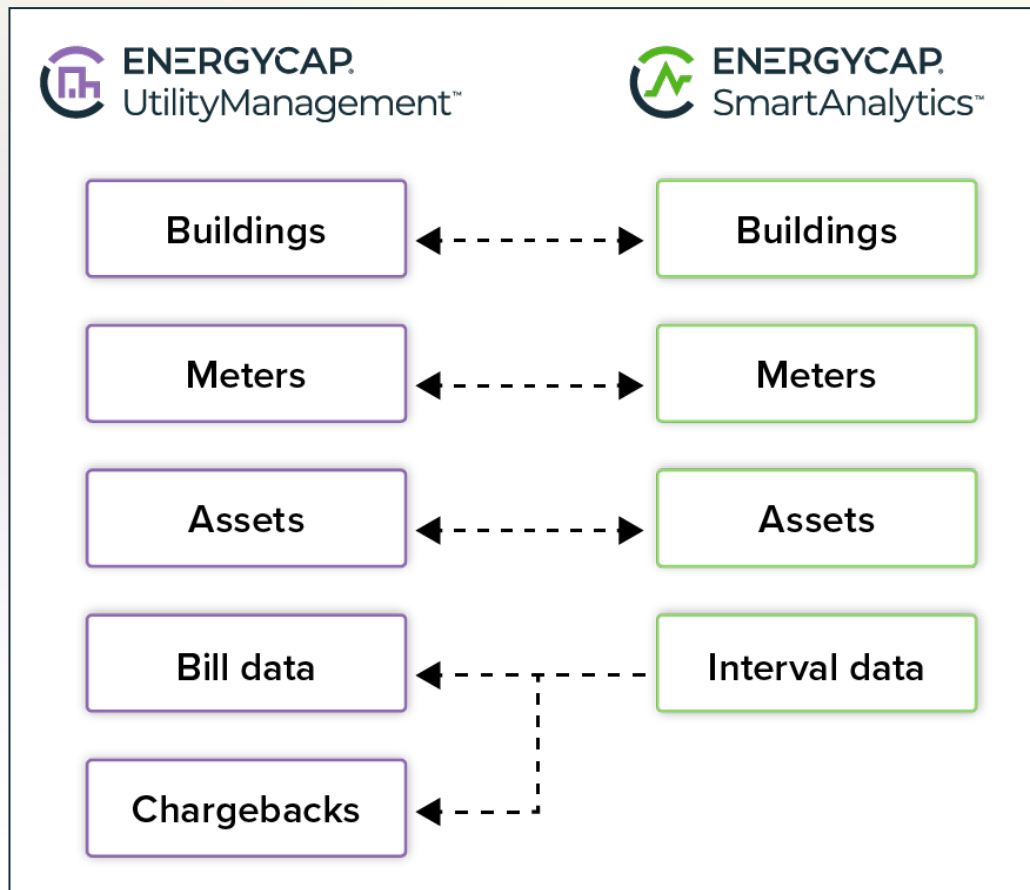


# Data Elements // SmartAnalytics

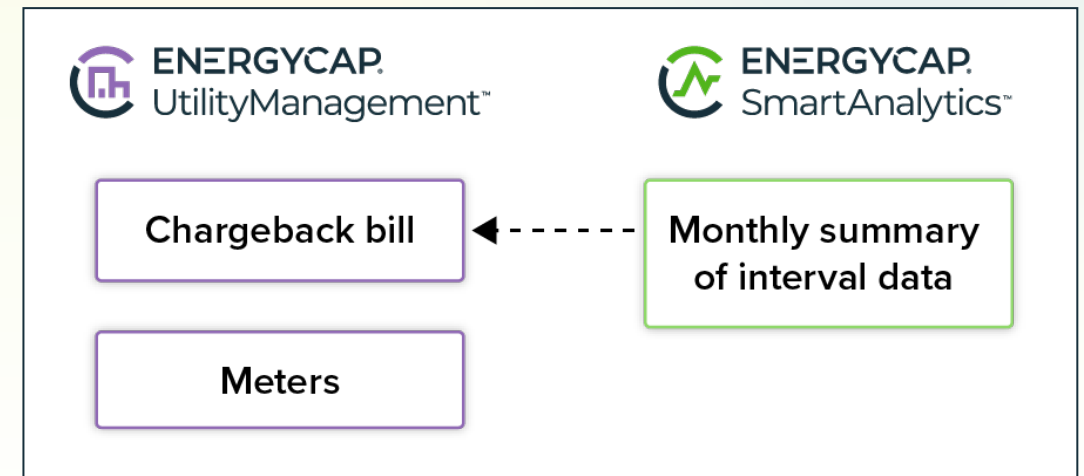


# Share and Combine Objects

## Share Buildings, Meters, Assets, and Interval Data



## Create Monthly Bills from Interval Data



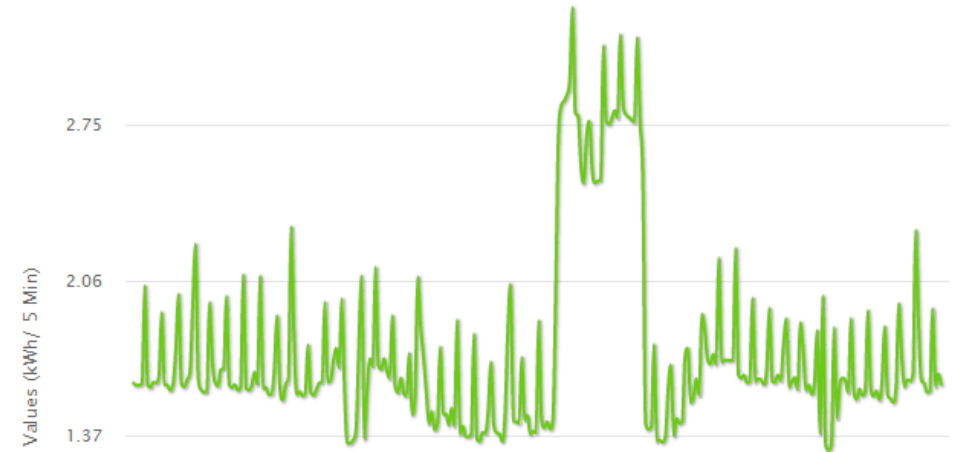
# Link Meters to Share Data

- Organic Farm
  - Organic Farm - Domestic Water
  - Organic Farm - Effluent Area
  - Organic Farm - Gas Main
  - Organic Farm - HVAC**
  - Organic Farm - Refrigeration

- Organic Farm
  - > Effluent Area
  - Gas Main
  - HDD Food corp
  - > HVAC**
  - > IAQ Monitor
  - Production data
  - > Refrigeration
  - Water main

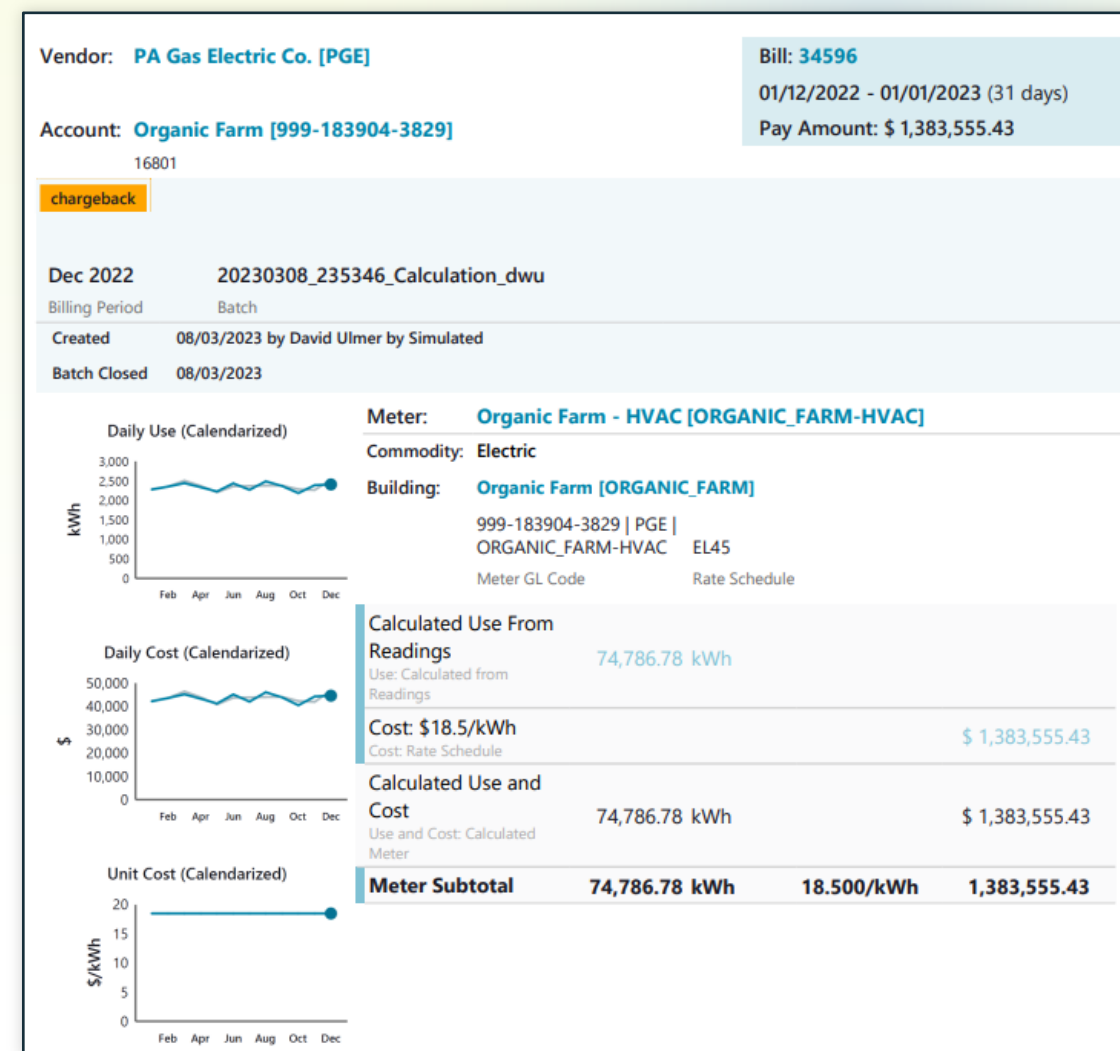
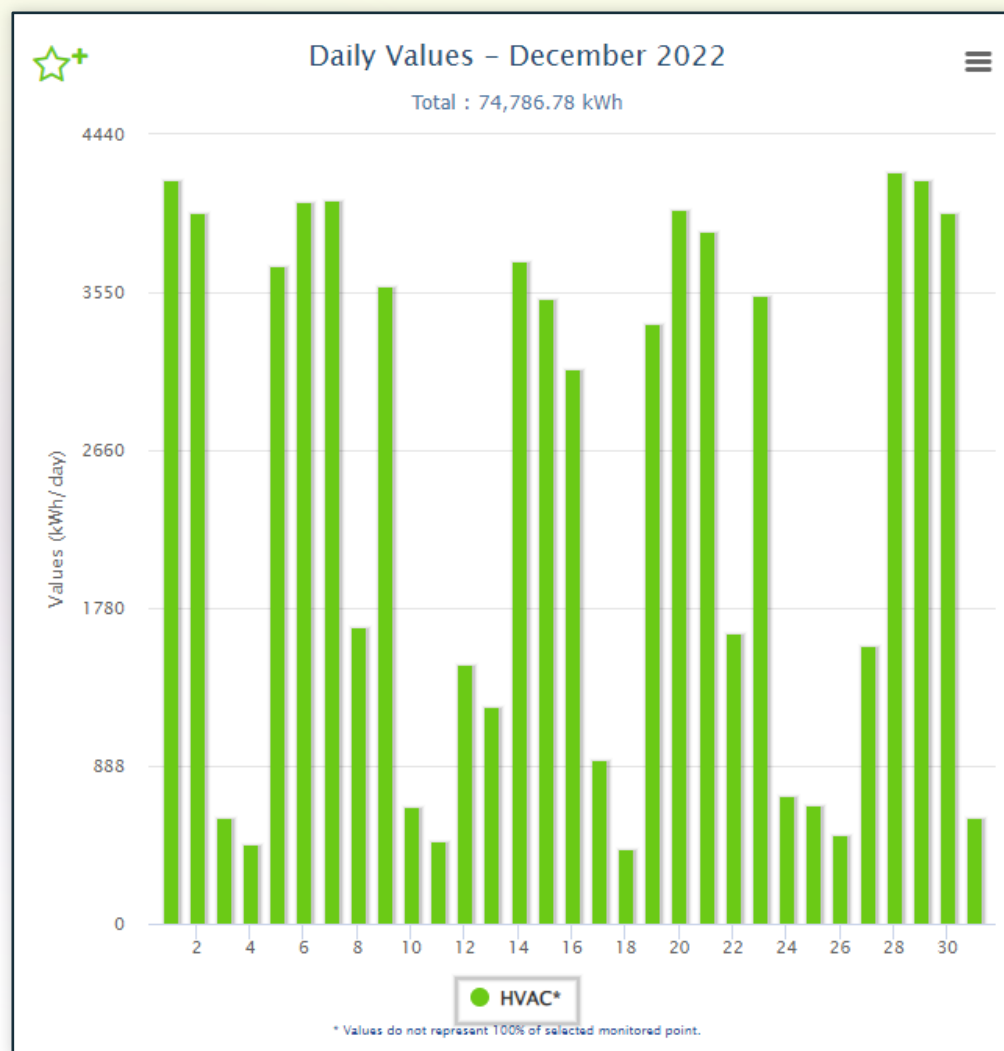
... > Smart Metered Buildings > Data Center > Data Center - Chillers [DAT... [Open in SmartAnalytics](#)

- > Employee Sites
- > EnergyCAP
- > Food Corp.
  - > Organic Farm
    - > Effluent Area
    - Gas Main
    - HDD Food corp
    - > HVAC**
    - > IAQ Monitor
    - Production data
    - > Refrigeration
    - Water main



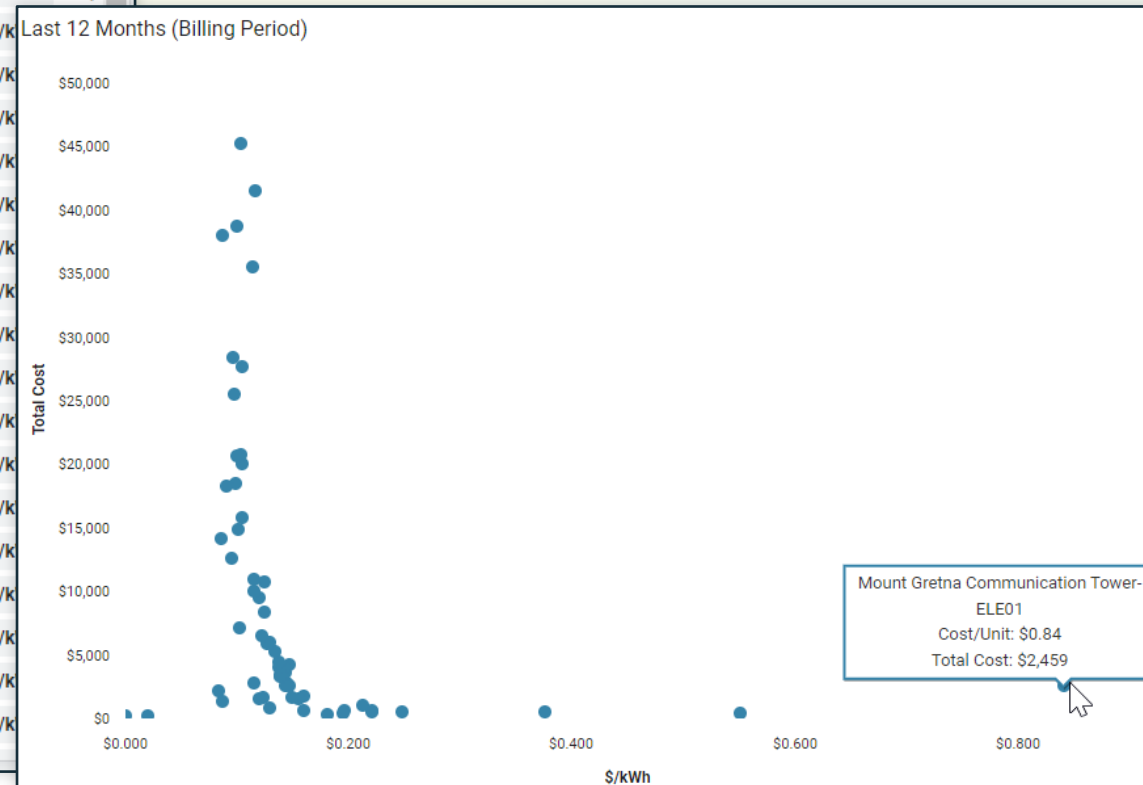


# Convert Interval Data to Monthly Bills



# Energy Procurement // Identify Targets Using Benchmarking

Cost	Unit	High to Low	Filters
March 2019–February 2023 (Billing Period)			
10th & Central Parking Garage-ELE26	\$0.873/kWh		
4th & Walnut Parking Garage-ELE02	\$0.648/kWh		
Welch Pool Parking Garage-ELE09	\$0.320/kWh		
10th & Central Parking Garage-ELE17	\$0.311/kWh		
Mount Gretna Communication Tower-ELE01	\$0.307/kWh		
Twin Pines Garage-ELE02	\$0.303/kWh		
10th & Central Parking Garage-ELE23	\$0.254/kWh		
10th & Central Parking Garage-ELE18	\$0.243/kWh		
3rd & West Parking Garage-ELE03	\$0.220/kWh		
Justice Center-ELE01	\$0.199/kWh		
North Precinct Lights-ELE05B	\$0.191/kWh		
North Precinct-ELE05D	\$0.188/kWh		
Justice Center-ELE02	\$0.179/kWh		
Jacobs Precinct-ELE02	\$0.171/kWh		
10th & Central Parking Garage-ELE16	\$0.168/kWh		
10th & Central Parking Garage-ELE19	\$0.167/kWh		
10th & Central Parking Garage-ELE25	\$0.155/kWh		
10th & Central Parking Garage-ELE15	\$0.153/kWh		
New Town - ELE01	\$0.150/kWh		
10th & Central Parking Garage-ELE14	\$0.148/kWh		



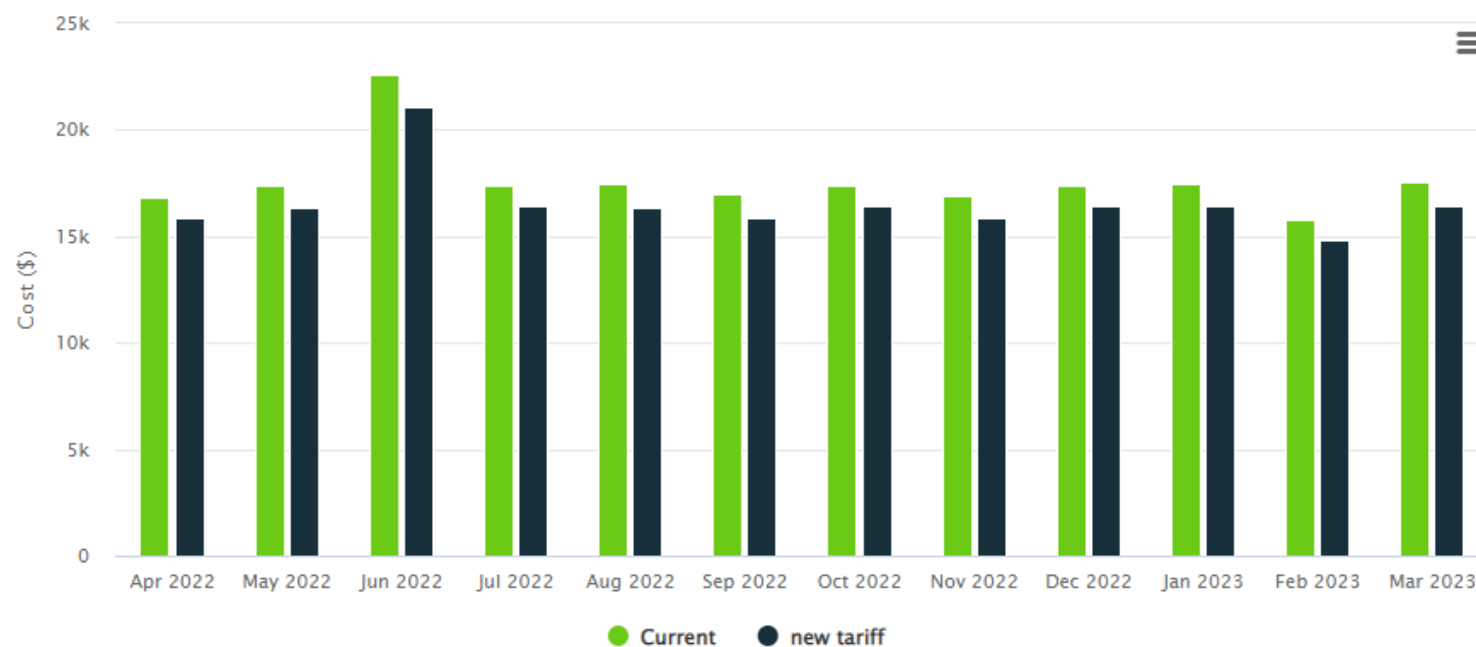
# Energy Procurement // Build Tariffs and Run “What If” Scenarios

## Alpha Hotel tariffs > electricity tariff analyser

Past 12 months cost analysis\*

Add a new tariff to the analysis...

tariffs	Apr 2022	May 2022	Jun 2022	Jul 2022	Aug 2022	Sep 2022	Oct 2022	Nov 2022	Dec 2022	Jan 2023	Feb 2023	Mar 2023	Total
<b>Current</b>	\$16,798	\$17,378	\$22,557	\$17,366	\$17,473	\$16,958	\$17,382	\$16,940	\$17,415	\$17,429	\$15,760	\$17,529	<b>\$210,986</b>
<b>new tariff</b>	\$15,855	\$16,358	\$21,092	\$16,452	\$16,360	\$15,888	\$16,457	\$15,884	\$16,387	\$16,421	\$14,826	\$16,416	<b>\$198,396 (-6%)</b>



# Energy Procurement // Rate Structures

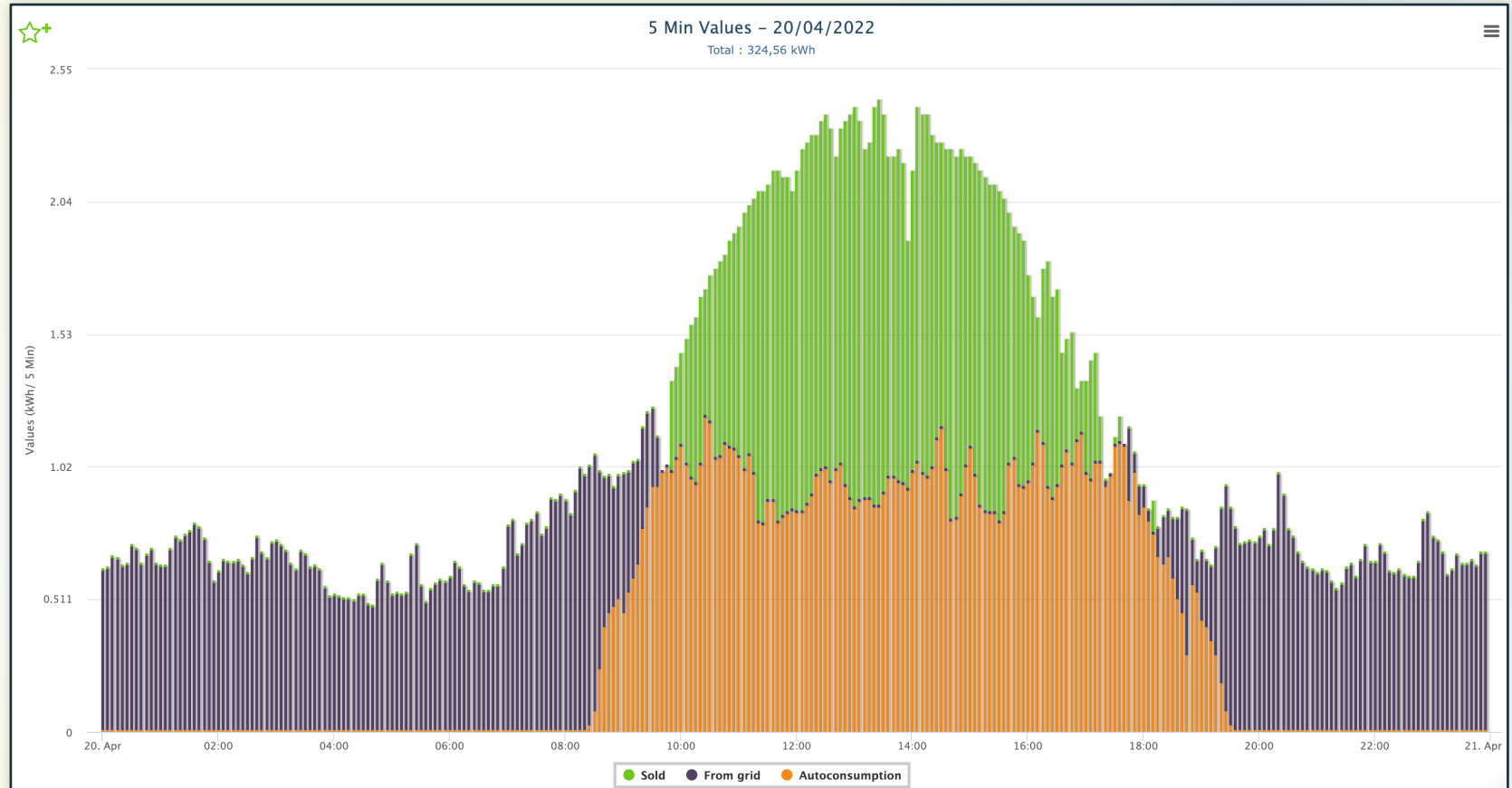
- Time of use charges
- Seasonal rate structures
- Better visibility into times of day causing cost spikes

T1 : 0.2 \$/kWh	T2 : 0.38 \$/kWh
T3 : 0.5 \$/kWh	T4 : 0.65 \$/kWh
Add rate	
Tariff Periods	
Sep 1st to Dec 31st	
May 1st to Aug 31st	
Jan 1st to Dec 31st	
+ Add tariff period	

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
00:00	T1	T1	T1	T1	T1	T3	T3
00:30	T1	T1	T1	T1	T1	T3	T3
01:00	T1	T1	T1	T1	T1	T3	T3
01:30	T1	T1	T1	T1	T1	T3	T3
02:00	T1	T1	T1	T1	T1	T3	T3
02:30	T1	T1	T1	T1	T1	T3	T3
03:00	T1	T1	T1	T1	T1	T3	T3
03:30	T1	T1	T1	T1	T1	T3	T3
04:00	T1	T1	T1	T1	T1	T3	T3
04:30	T1	T1	T1	T1	T1	T3	T3
05:00	T1	T1	T1	T1	T1	T3	T3
05:30	T1	T1	T1	T1	T1	T3	T3
06:00	T4	T4	T4	T4	T4	T2	T2
06:30	T4	T4	T4	T4	T4	T2	T2
07:00	T4	T4	T4	T4	T4	T2	T2
07:30	T4	T4	T4	T4	T4	T2	T2
08:00	T4	T4	T4	T4	T4	T2	T2
08:30	T4	T4	T4	T4	T4	T2	T2
09:00	T4	T4	T4	T4	T4	T2	T2
09:30	T4	T4	T4	T4	T4	T2	T2
10:00	T4	T4	T4	T4	T4	T2	T2

# Energy Procurement // Understand Consumption Sources

- Report on sources in real-time
- Track generation and selling activities
- Apply CO2 in real-time to generation and consumption
- Track renewables

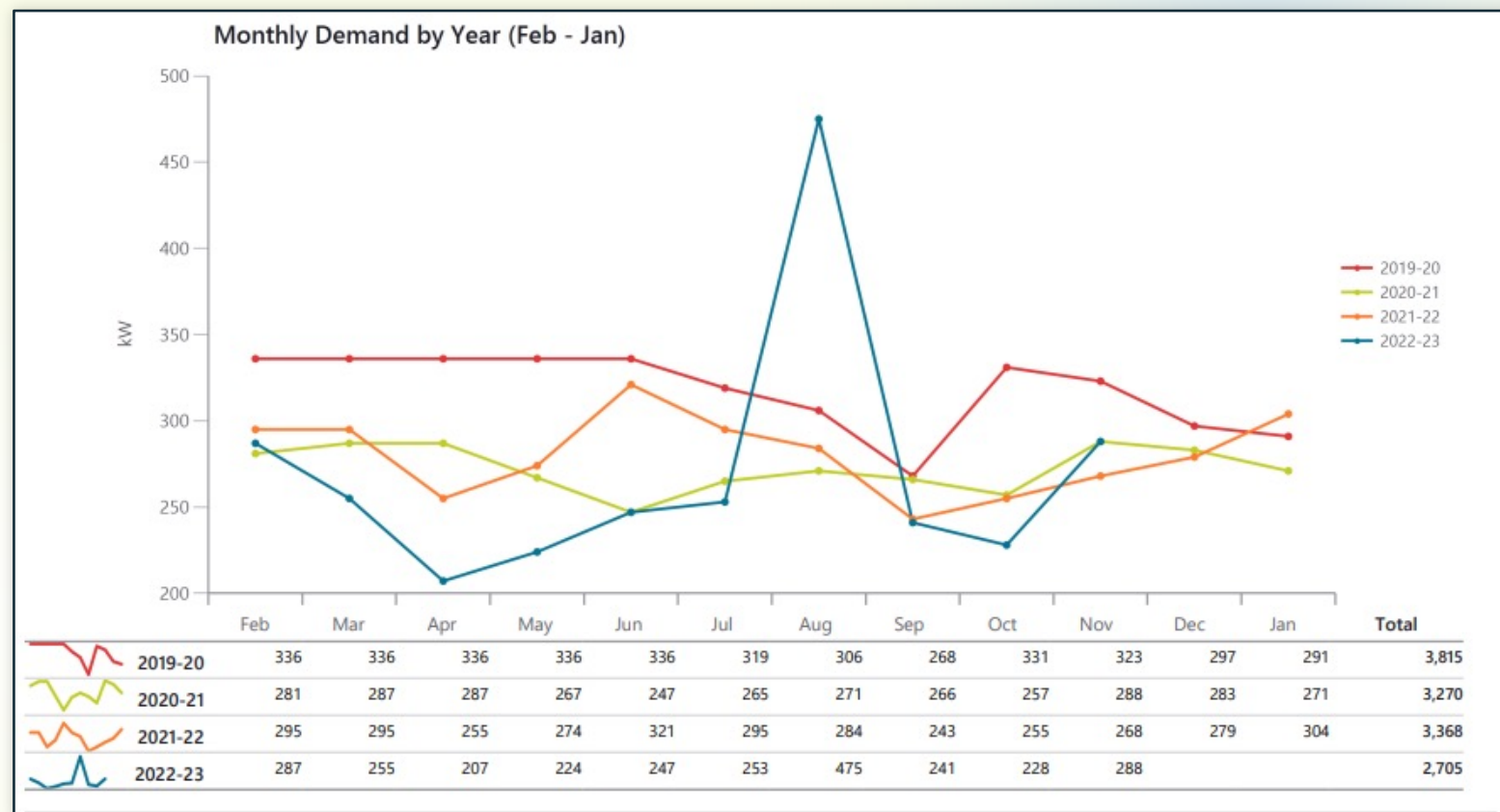


## **Demand Management // Overview**

- Limiting demand can be greatest potential for savings opportunities on bills
- Some rates use highest demand for any point during a timeframe
- One 'boo-boo' sets rate for the year
- Can't measure what you don't monitor
- Limiting demand spikes make for more predictable and lower cost bills

# Demand Management // Pinpoint Periods

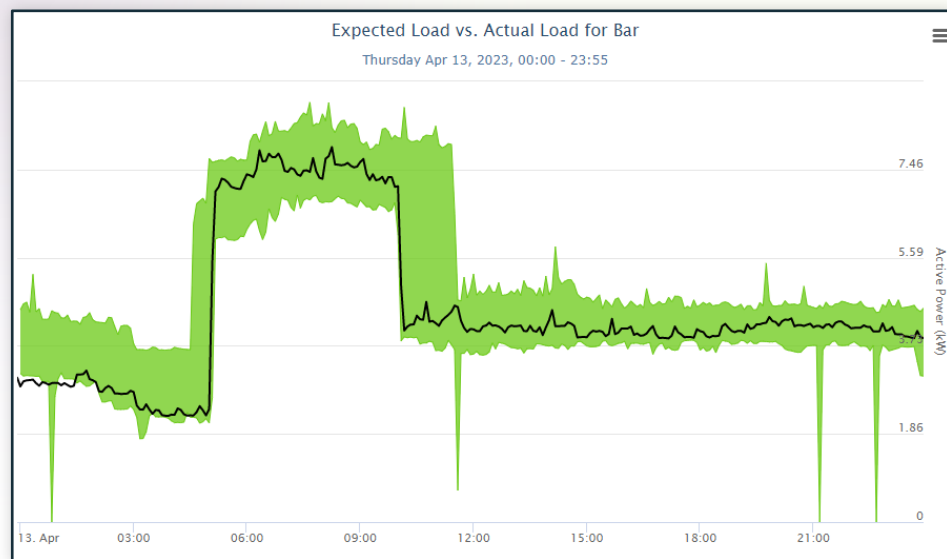
- Demand shows up on bills
- The 30-day snapshot provides no explanation of when or what was causing it
- Helpful to see reports of values
- How do you limit spikes like this from occurring which you might then be paying for throughout the entire year?





# Demand Management // Alerts, Thresholds, AI

- Alarms and alerts provide informative and actionable insights
- Set thresholds to alert you of potential spikes
- Define when and how you want to receive notifications
- Fine tune based on AI predictive values



**Alert type** Value against threshold ▼

**Alert name** Peak Demand

**Notify me when parameter** kW (active power total) ▼

**Condition** above or equal to ▼

**Threshold** 300 active power

**Duration** 1 consecutive reading(s) before alert is triggered

**When alert is enabled** between ... ▼ 08:00 and 05:00

for the days ... ▼ ☒ Mon ☒ Tue ☒ Wed ☒ Thu ☒ Fri ☐ Sat ☐ Sun

**Notifications** ☒ Dashboard homepage

☐ SMS (You don't have your mobile number set yet, [add it](#))

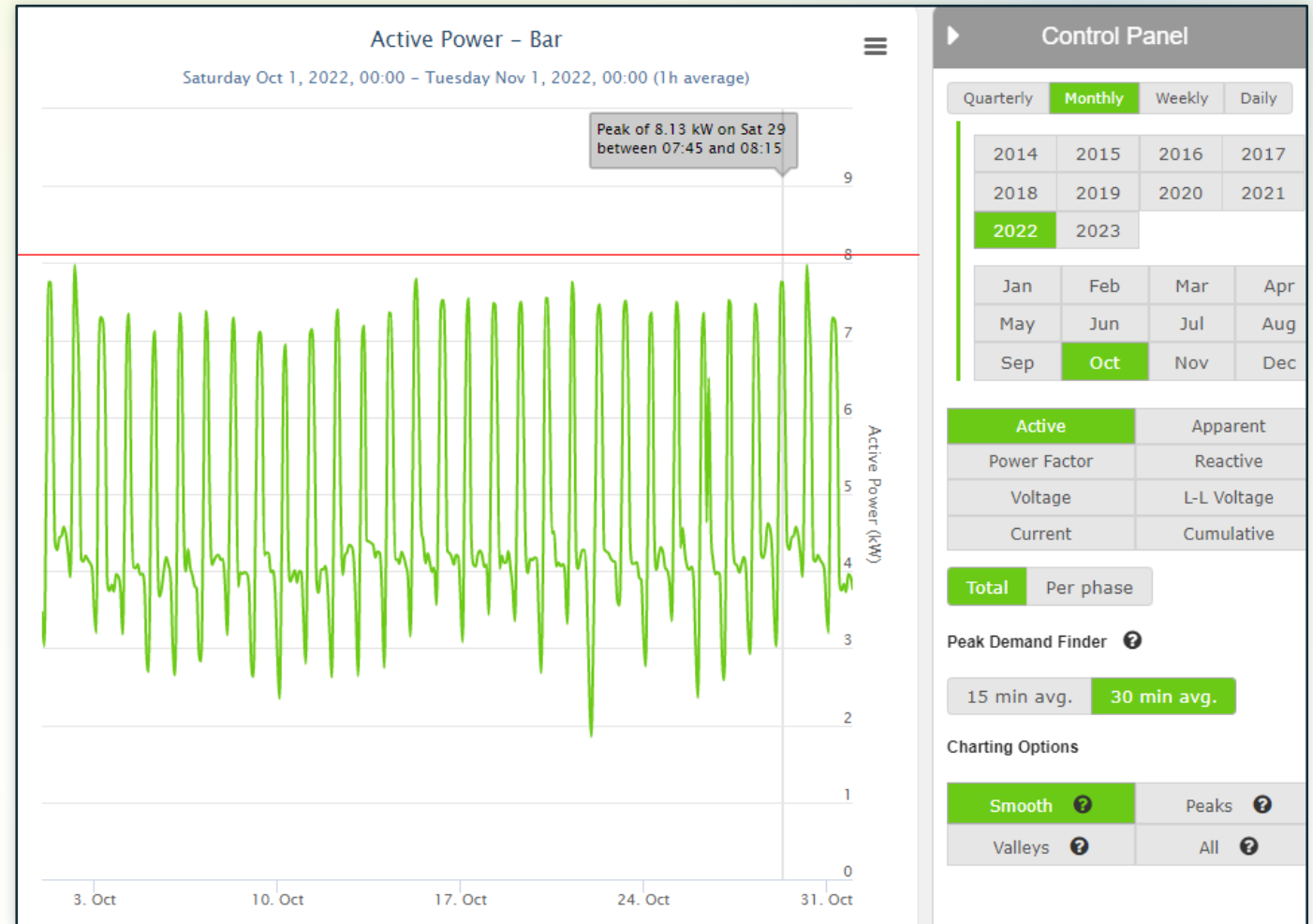
☒ Email

☐ Send notifications to all users associated to this site

**Add email addresses to receive the notification (comma separated)** john.heinz@energycap.com,adam.wetzel@energycap.com


# Demand Management // Monitor and Analyze

- Actively monitor and analyze demand in user-defined periods
- Determine time period with more intensive spikes during 15- or 30-minute averages
- Understand the exact time periods for billed demand, what activities are going on, and what equipment is causing spikes



# Bill Reconciliation // Billed vs Metered

Find variances of billed vs metered use and demand



Aurora Public Schools

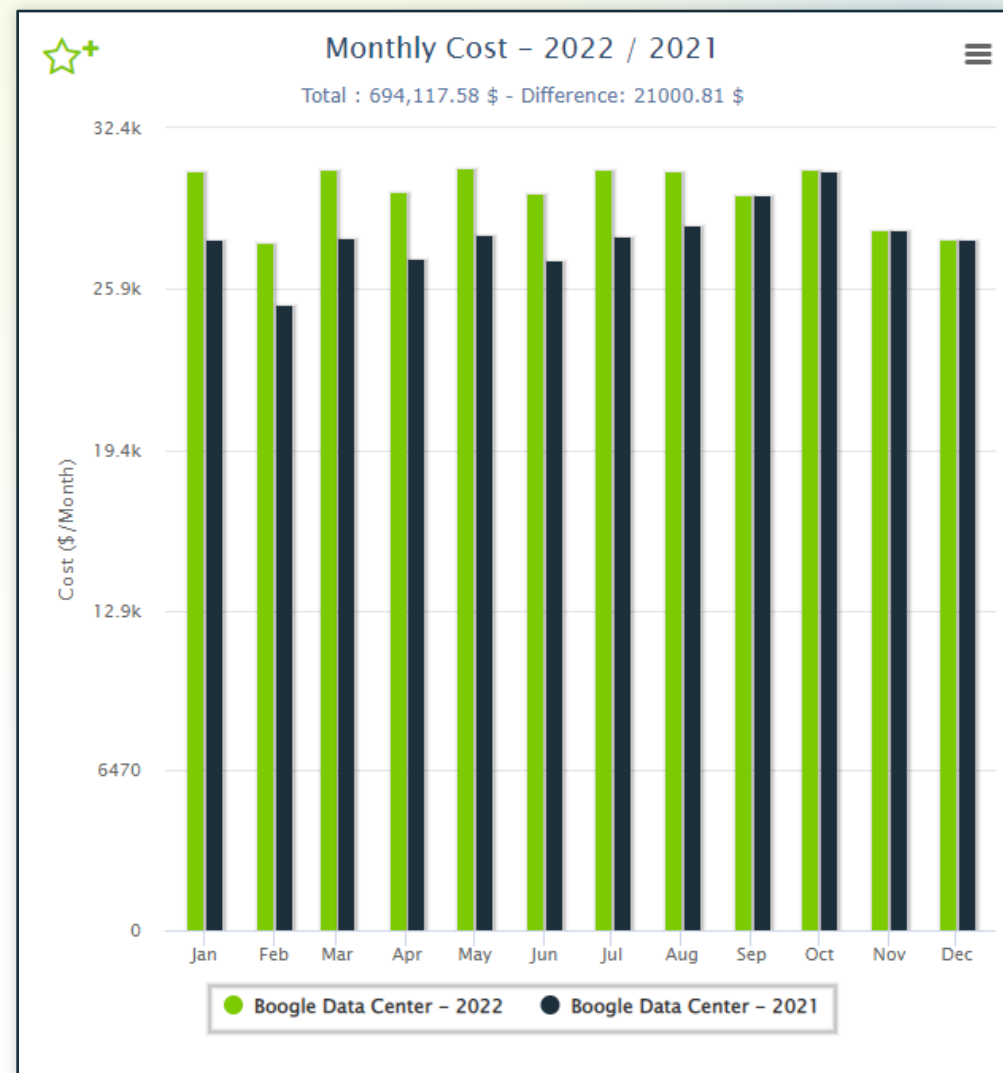
Report-35 - Bill Use Reconciliation Report

Electric

Meter Code	Place	Billing Period	Start Date	End Date	Billed Use	Metered Use Unit	Variance	Variance %	Actual Demand on Bill	Billed Demand on Bill	Max Demand on Bill	Max Metered Unit Demand	Variance	Variance %
300980468EL	Altura ES	201707	7/19/2017	8/17/2017	32,000.00	31,083.58 kWh	(916.42)	-2.86%	229.28	229.00	229.28	224.72 kW	(4.56)	-1.99%
300980468EL	Altura ES	201708	8/17/2017	9/18/2017	44,480.00	43,348.20 kWh	(1,131.80)	-2.54%	251.36	251.00	251.36	245.61 kW	(5.75)	-2.29%
300980468EL	Altura ES	201709	9/18/2017	10/17/2017	33,280.00	30,660.00 kWh	(2,620.00)	-7.87%	234.08	234.00	234.08	230.77 kW	(3.31)	-1.41%
300980468EL	Altura ES	201710	10/17/2017	11/15/2017	30,560.00	29,177.85 kWh	(1,382.15)	-4.52%	209.00	209.00	209.00	202.32 kW	(6.68)	-3.19%
300980468EL	Altura ES	201711	11/15/2017	12/18/2017	36,480.00	13,638.24 kWh	(22,841.76)	-62.61%	162.40	162.00	162.40	157.86 kW	(4.54)	-2.79%
300980468EL	Altura ES	201801	1/19/2018	2/20/2018	40,320.00	14,849.67 kWh	(25,470.33)	-63.17%	183.00	183.00	183.00	173.61 kW	(9.39)	-5.13%
300980468EL	Altura ES	201803	2/20/2018	3/21/2018	37,600.00	35,844.33 kWh	(1,755.67)	-4.67%	176.00	176.00	176.00	169.43 kW	(6.57)	-3.73%
300980468EL	Altura ES	201804	3/21/2018	4/19/2018	30,240.00	29,560.76 kWh	(679.24)	-2.25%	172.16	172.00	172.16	168.32 kW	(3.84)	-2.23%
300980468EL	Altura ES	201805	4/19/2018	5/18/2018	34,560.00	33,670.15 kWh	(889.85)	-2.57%	208.00	208.00	208.00	199.49 kW	(8.51)	-4.09%
300980468EL	Altura ES	201806	5/18/2018	6/19/2018	21,120.00	20,702.95 kWh	(417.05)	-1.97%	205.00	205.00	205.00	198.23 kW	(6.77)	-3.30%
300980468EL	Altura ES	201807	6/19/2018	7/19/2018	18,080.00	17,684.46 kWh	(395.54)	-2.19%	159.00	159.00	159.00	152.89 kW	(6.11)	-3.84%
300980468EL	Altura ES	201808	7/19/2018	8/17/2018	36,320.00	35,531.49 kWh	(788.51)	-2.17%	234.00	234.00	234.00	224.94 kW	(9.06)	-3.87%
300980468EL	Altura ES	201809	8/17/2018	9/18/2018	43,840.00	42,682.23 kWh	(1,157.77)	-2.64%	260.00	260.00	260.00	252.47 kW	(7.53)	-2.90%
300980468EL	Altura ES	201810	9/18/2018	10/17/2018	36,640.00	35,258.89 kWh	(1,381.11)	-3.77%	254.08	254.00	254.08	246.02 kW	(8.06)	-3.17%
300980468EL	Altura ES	201811	10/17/2018	11/15/2018	33,120.00	28,899.03 kWh	(4,220.97)	-12.74%	184.16	184.00	184.16	175.34 kW	(8.82)	-4.79%
300980468EL	Altura ES	201812	11/15/2018	12/18/2018	42,240.00	40,322.30 kWh	(1,917.70)	-4.54%	172.32	172.00	172.32	168.08 kW	(4.24)	-2.46%
300980468EL	Altura ES	201901	12/18/2018	1/21/2019	39,840.00	39,315.45 kWh	(524.55)	-1.32%	164.48	164.00	164.48	163.47 kW	(1.01)	-0.62%
300980468EL	Altura ES	201902	1/21/2019	2/20/2019	39,360.00	39,075.85 kWh	(284.15)	-0.72%	174.00	174.00	174.00	172.18 kW	(1.82)	-1.05%
300980468EL	Altura ES	201903	2/20/2019	3/21/2019	38,080.00	37,519.37 kWh	(560.63)	-1.47%	180.00	180.00	180.00	176.04 kW	(3.96)	-2.20%
300980468EL	Altura ES	201904	3/21/2019	4/19/2019	28,640.00	28,399.36 kWh	(240.64)	-0.84%	182.24	182.00	182.24	177.76 kW	(4.48)	-2.46%
300980468EL	Altura ES	201905	4/19/2019	5/20/2019	33,760.00	33,441.48 kWh	(318.52)	-0.94%	195.20	195.00	195.20	193.09 kW	(2.11)	-1.08%
300980468EL	Altura ES	201906	5/20/2019	6/19/2019	16,160.00	15,929.72 kWh	(230.28)	-1.43%	136.16	136.00	136.16	138.42 kW	2.26	1.66%
300980468EL	Altura ES	201907	6/19/2019	7/19/2019	14,720.00	14,483.25 kWh	(236.75)	-1.61%	197.12	197.00	197.12	186.85 kW	(10.27)	-5.21%

## Bill Reconciliation // Interval Data & Tariff to Compare Costs

- Use the applied tariff to interval data to rollup monthly costs
- Compare time periods: monthly and annual costs, year-over-year



## **Advanced Energy Management // Overview**

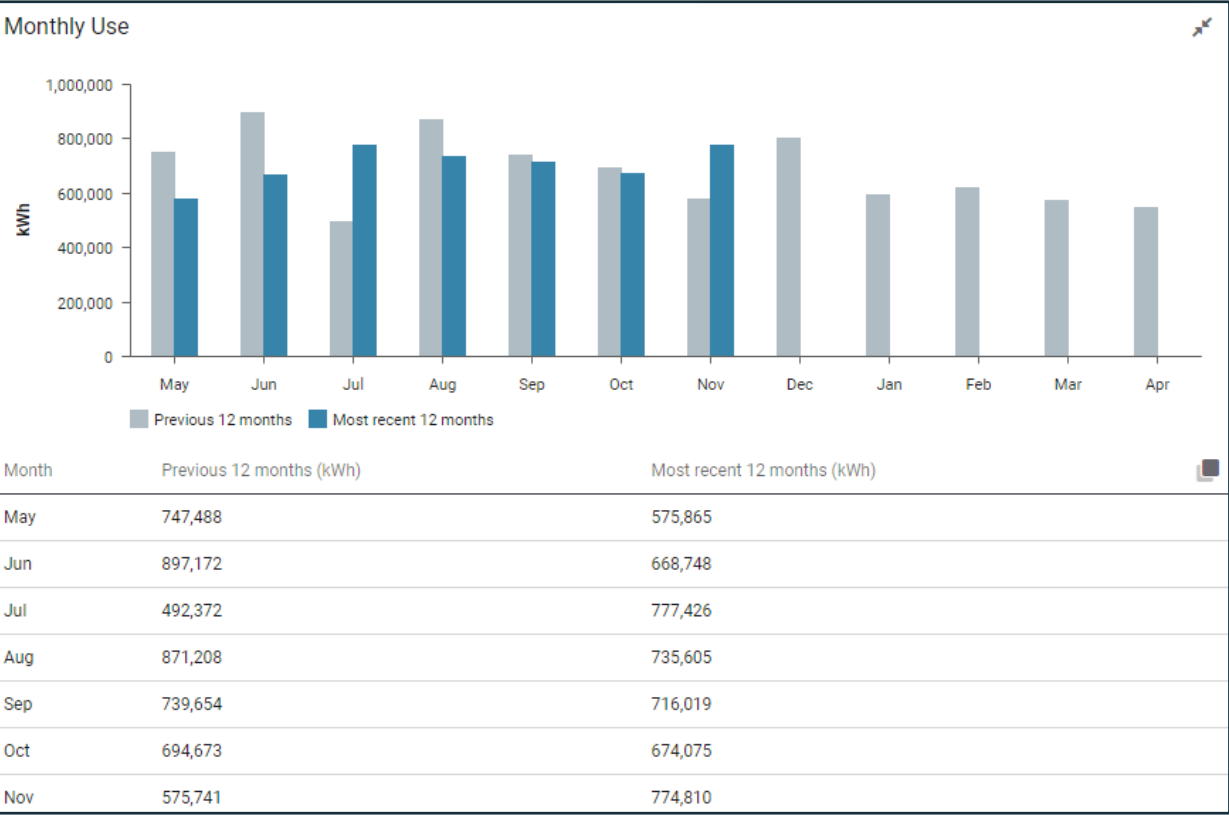
- Powerful tools for display of both real-time and monthly data
- Aggregate reporting for top-down views
- Pinpoint problems and outliers for targeted reduction strategies
- Perform simulated optimization activities to estimate savings
- Calculate the savings after implementing projects (simple & complex methods)
- Manage formulas to prove correlations, create targets, and more...

# Advanced Energy Management // Data Status

## Live status of data feeds



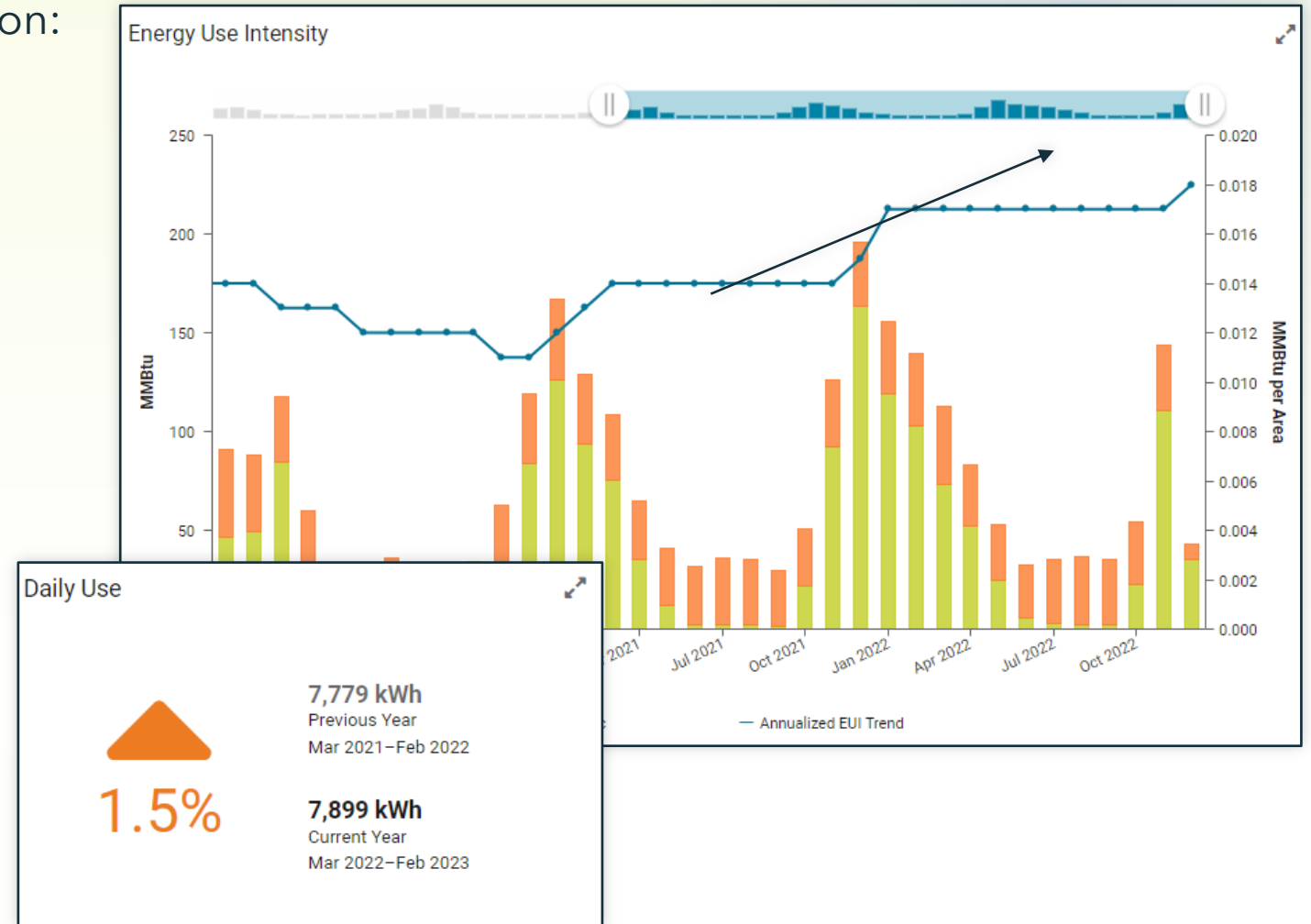
## Monthly status feeds



# Advanced Energy Management // Identification

Identify buildings needing special attention:

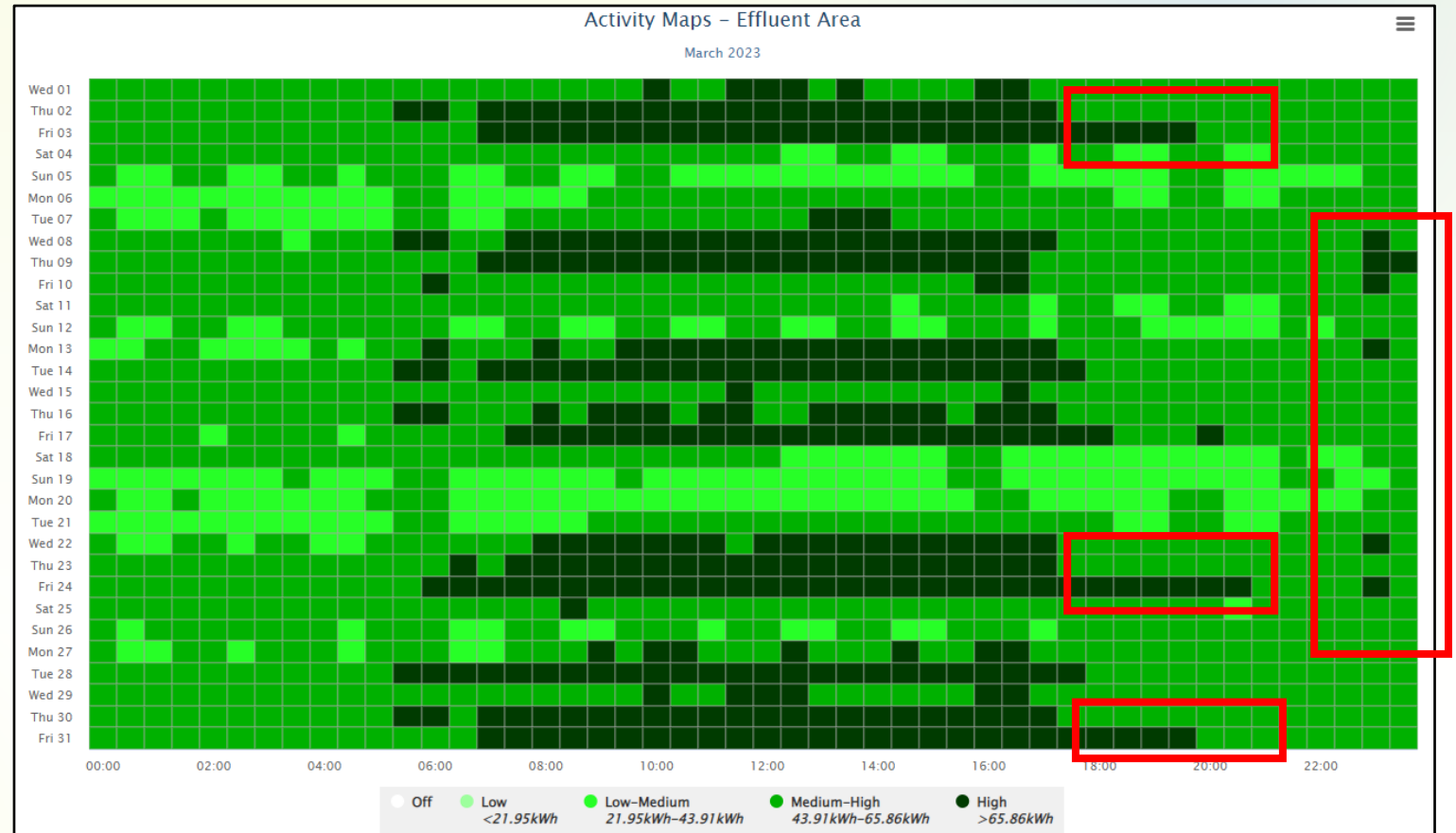
- Increases in EUI: consider weather
- Higher demand charges
- Consumption spikes
- Cost might not be best metric to use





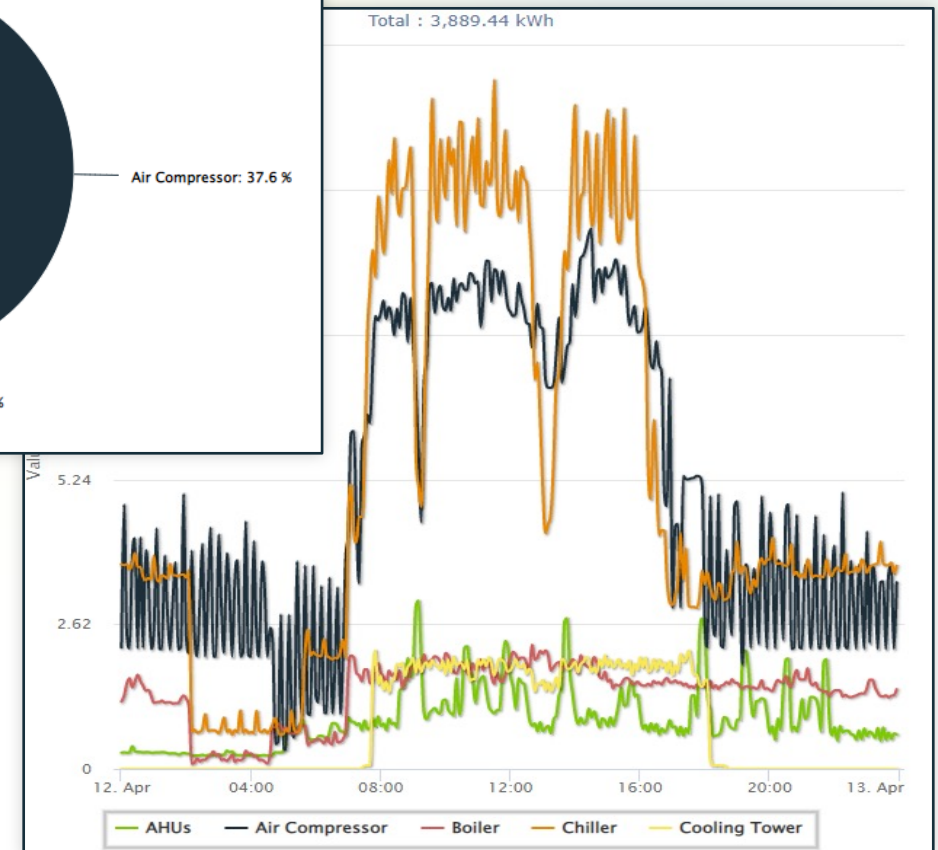
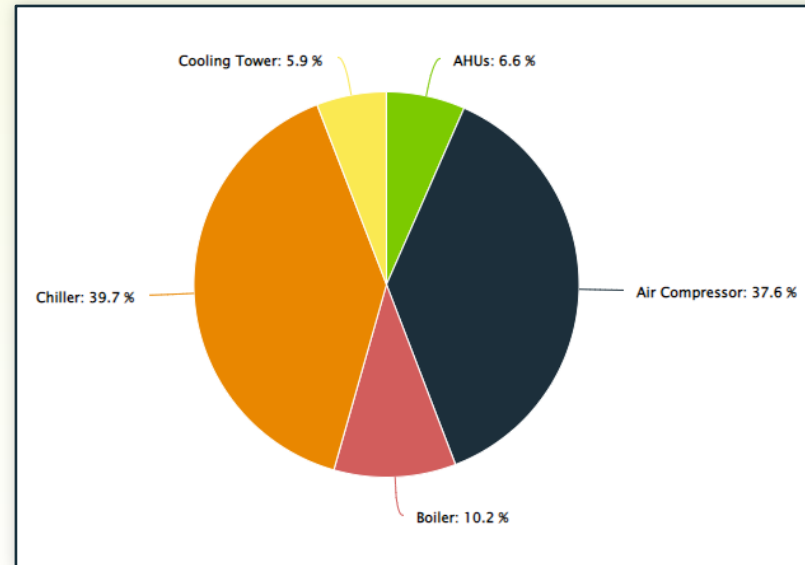
# Advanced Energy Management // Identification

- Heatmaps to see usage patterns and trends
- Identify times when usage seems to be problematic, or schedules aren't being followed
- Understand intensive periods and how that impacts your utility bill based on time of use rates



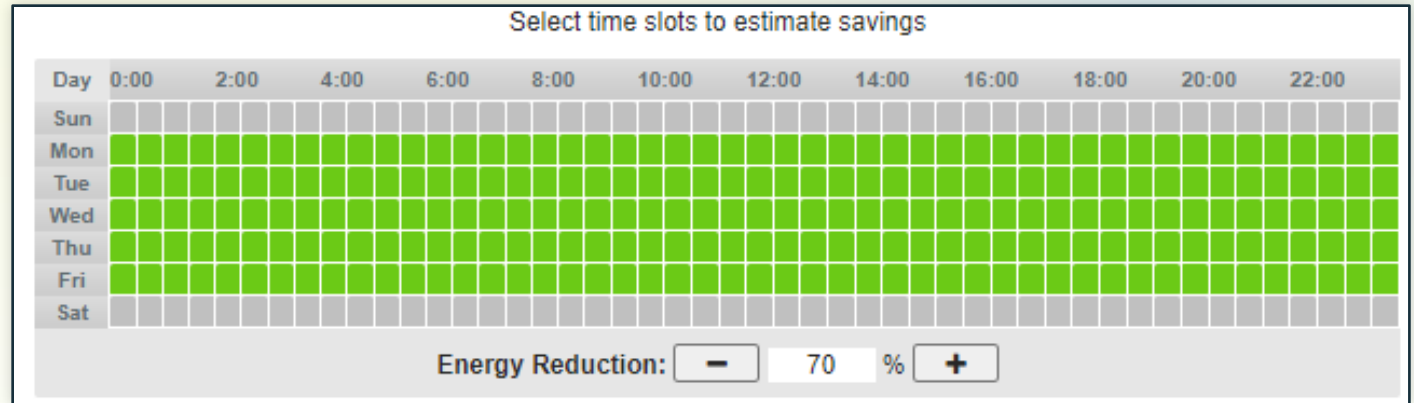
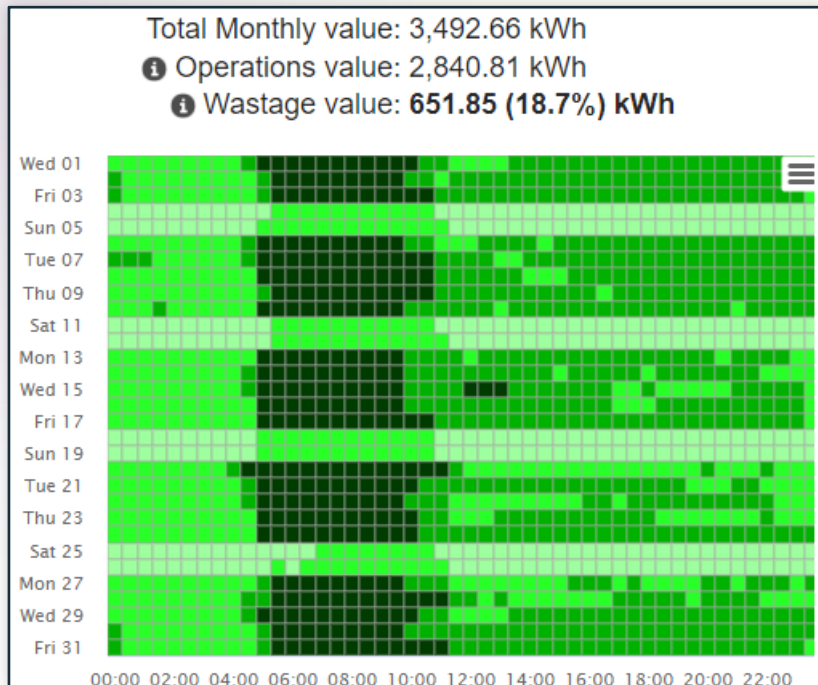
# Advanced Energy Management // Isolate

- Determine what zone, equipment, time of day, day of week is causing the spikes
- Depends on level of metering
- Overlay multiple points to compare, helpful when monitoring equipment (HVAC, Chillers, Refrigeration, etc.)



# Advanced Energy Management // Optimize

Perform schedule optimization to target reduction strategies and most effective time periods



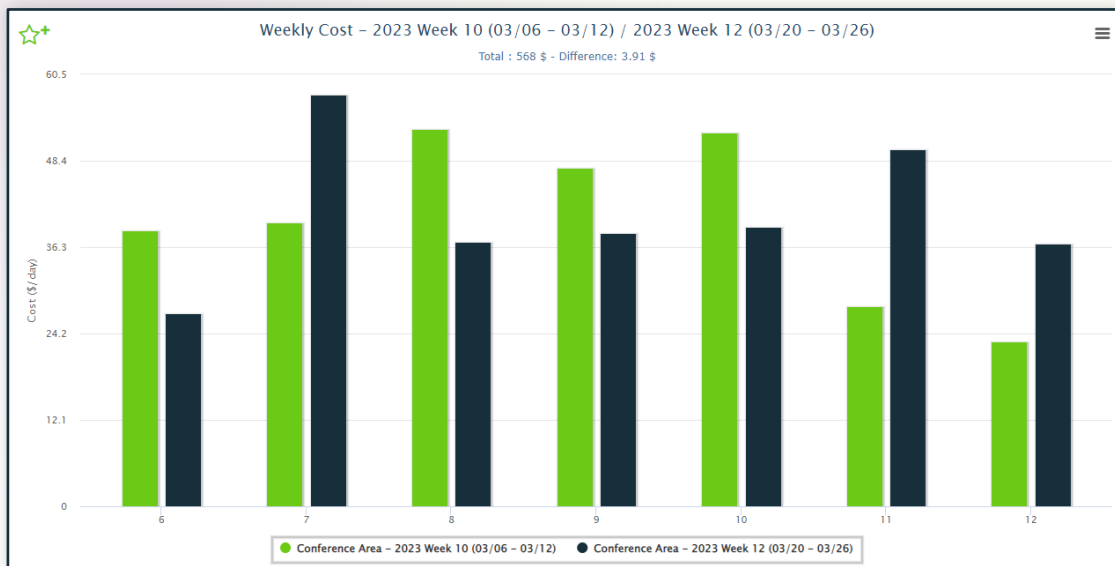
Heatmaps to simulate and visualize time periods of intensive usage and what the new schedule would look like

Calculate projected use and cost savings by making reduction changes

# Advanced Energy Management // Measure: Simple Method

Actions Tracker on interval data

Compare two time periods and when an action was performed



Compare any time period and calculate the difference in use, cost, CO2

# Advanced Energy Management // Measure: Simple Method

KPI on billing data

Compare two time periods to calculate savings on bills

Consider calendarized data

Cost Comparison ⓘ


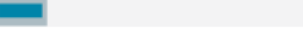
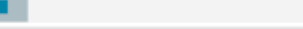
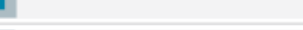
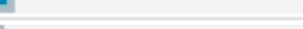
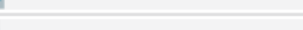

Jan 2022 - Dec 2022

**\$100,416.51**

↓ **13.8%**

Jan 2021 - Dec 2021

**\$116,483.56**

Meter Name	Meter Code	Calendarized Cost (\$)	Jan 2021 - Dec 2021	Jan 2022 - Dec 2022	% Difference
City Hall-ELE01	CITY HALL-ELE01		\$78,443	\$78,094	-0.4 % ▼
City Hall-NG01	CITY HALL-NG01		\$15,565	\$14,006	-10.0 % ▼
City Hall-SEW01	CITY HALL-SEW01		\$9,406	\$2,949	-68.6 % ▼
City Hall-WAT01	CITY HALL-WAT01		\$5,789	\$1,989	-65.6 % ▼
City Hall-STO01	CITY HALL-STO01		\$5,234	\$2,664	-49.1 % ▼
City Hall-WAT02	CITY HALL-WAT02		\$1,831	\$639	-65.1 % ▼
City Hall-WAT03	CITY HALL-WAT03		\$214	\$75	-65.1 % ▼
Total			\$116,484	\$100,417	-13.8 % ▼

Year-over-year comparisons

Easily aggregate all commodity costs

# Advanced Energy Management // Measure: Complex Method

- IPMVP Compliant Measurement and Verification of Savings

## Retrofit Isolation



**OPTION A**  
**Retrofit Isolation:**  
**Key Parameter(s) Measurement**

**OPTION B**  
**Retrofit Isolation:**  
**All Parameter Measurement**

## Whole Facility

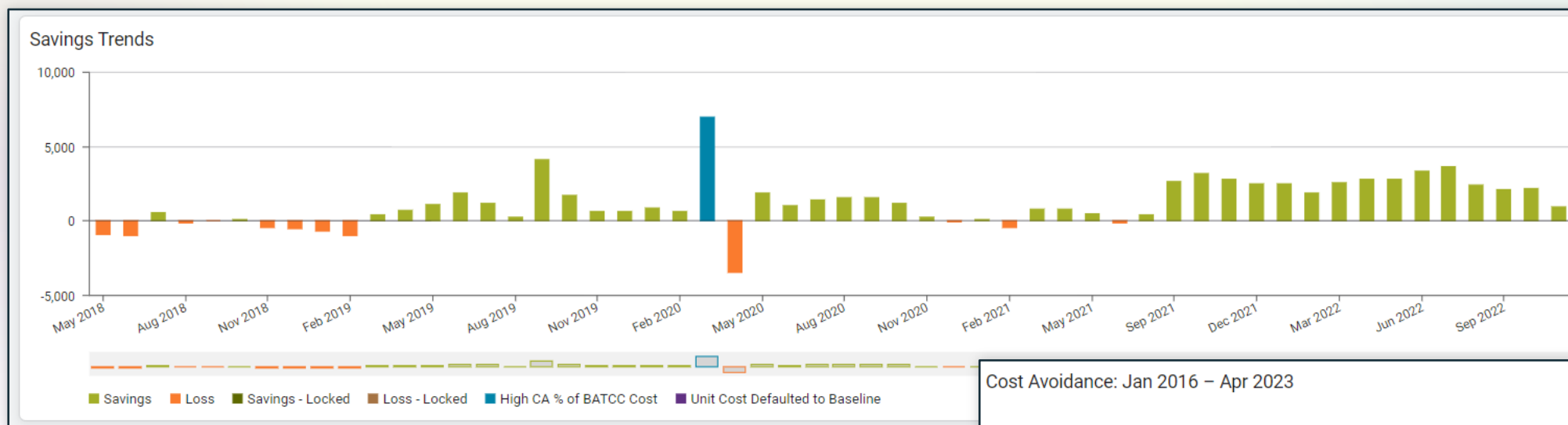


**OPTION C**  
**Whole Facility**

**OPTION D**  
**Calibrated Simulation**

# Advanced Energy Management // Measure: Complex Method

- IPMVP Option C - Whole Building
- Can't assume all savings are attributable to the project, adjust for base load and other factors



Cost Avoidance: Jan 2016 – Apr 2023

11.6%

\$ 679,938  
BATCC

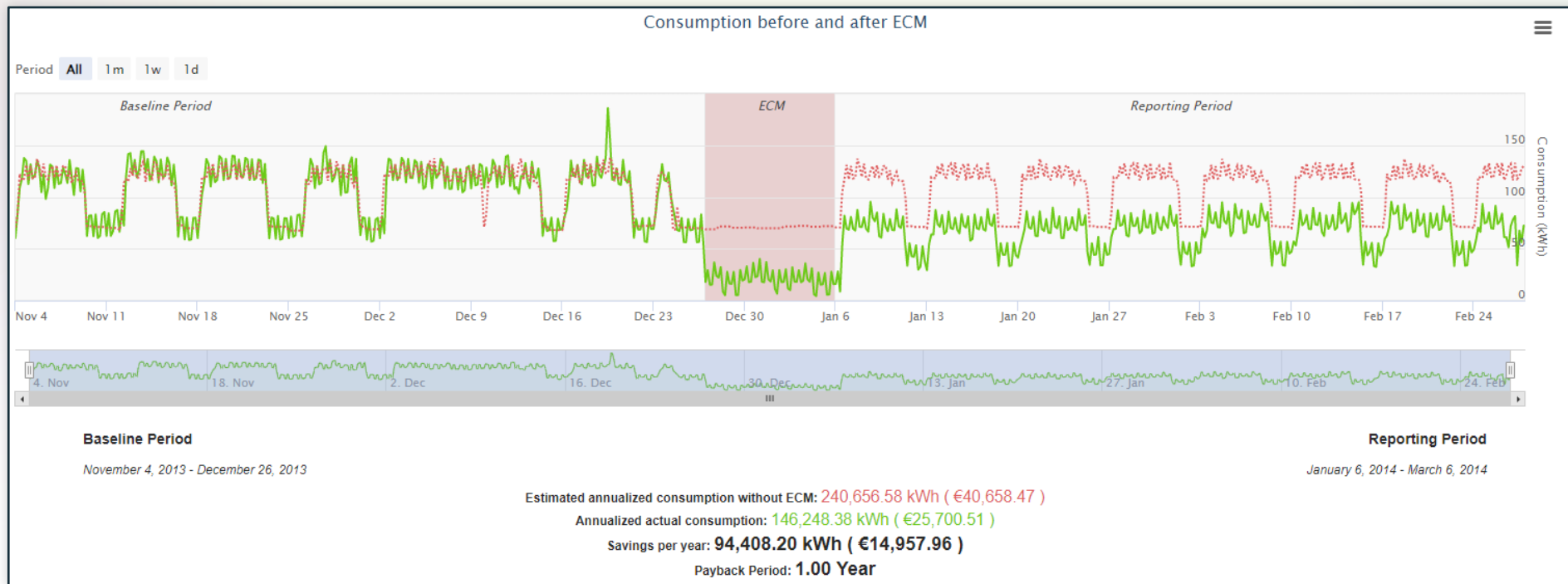
\$ 601,111  
Actual

\$ 78,827  
Savings



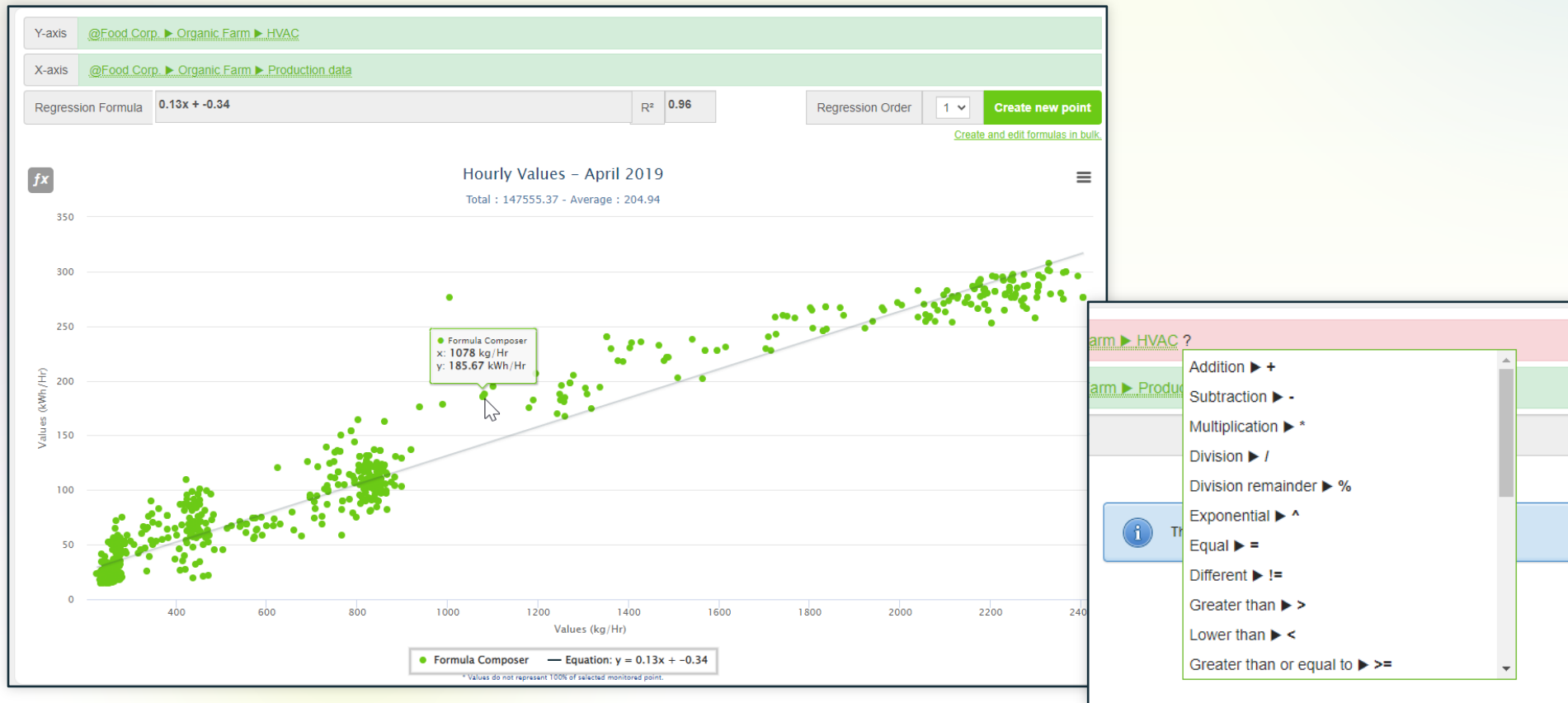
# Advanced Energy Management // Measure: Complex Method

- IPMVP Option B – Retrofit Isolation
- Calculate the savings and payback period attributed to projects
- More accurate since it isolates and measures the direct usage



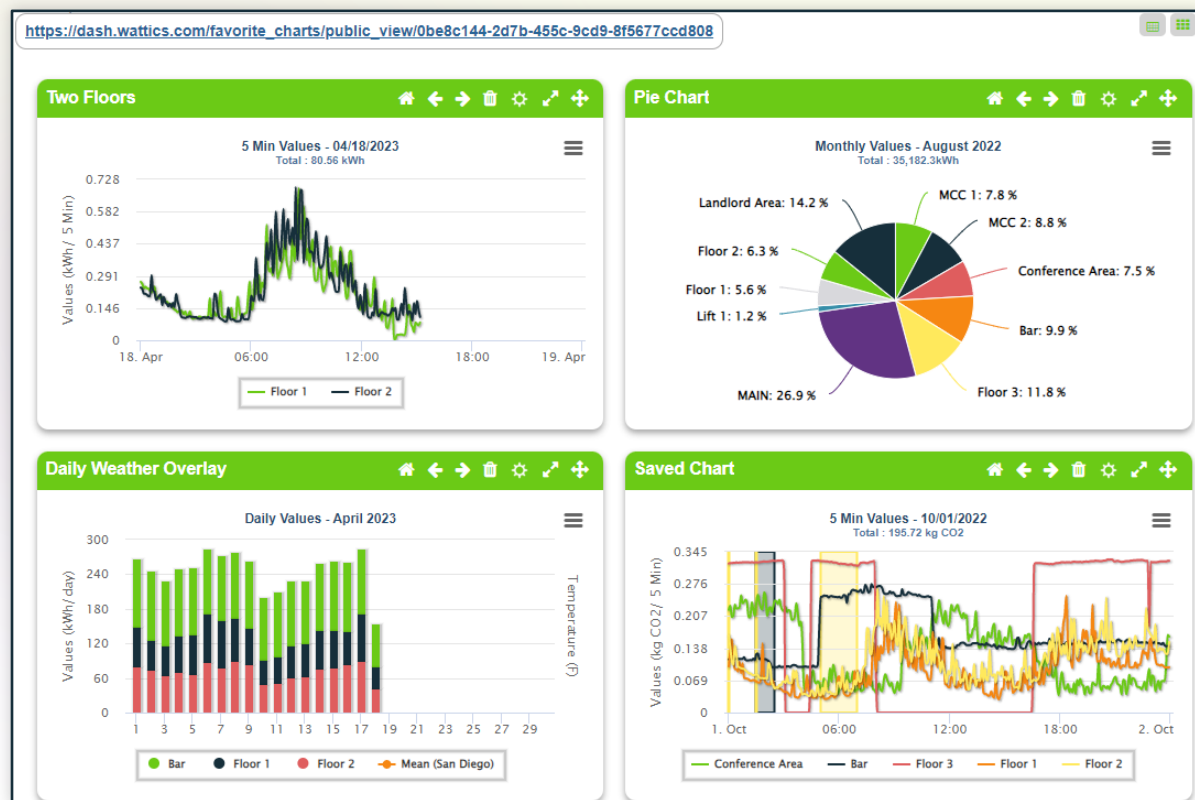
# Advanced Energy Management // Formulas and Comparisons

- Formulas to compare, aggregate, reduce, create targets, and more
- Formula points function like metered points, have sentinel, alarms, alerts, heatmaps, etc...

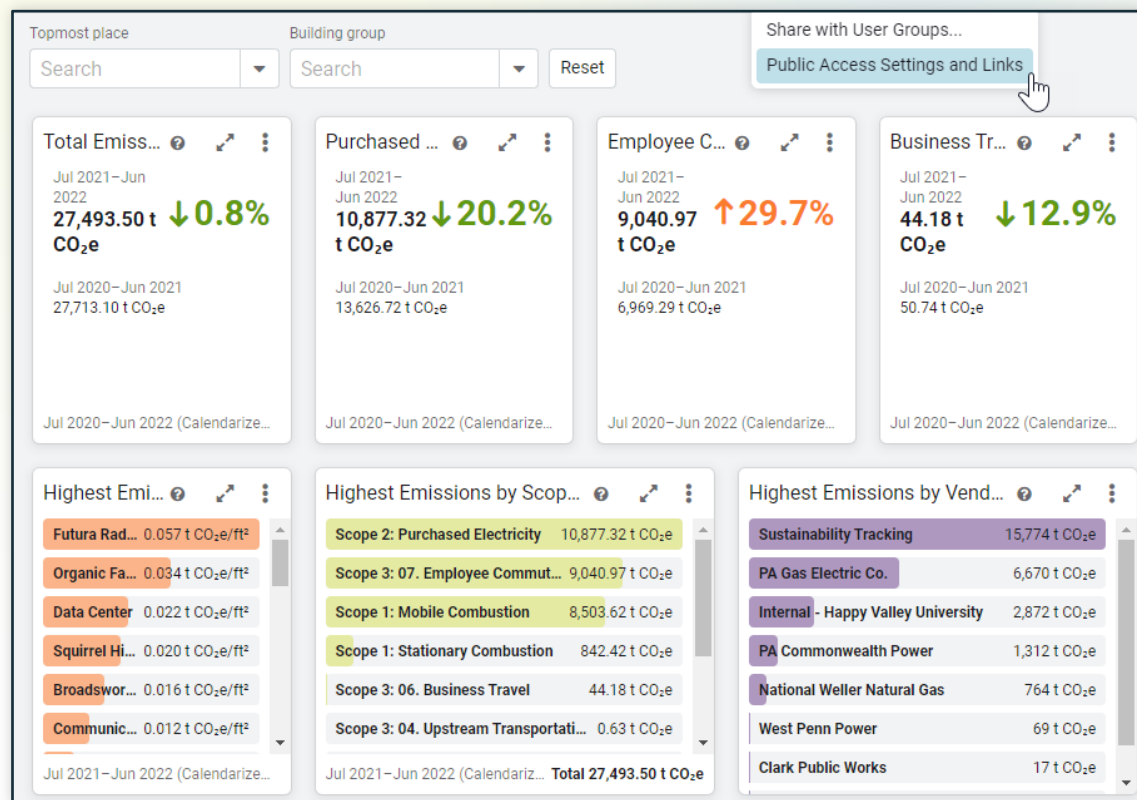


# Powerful Dashboards

Use both independently

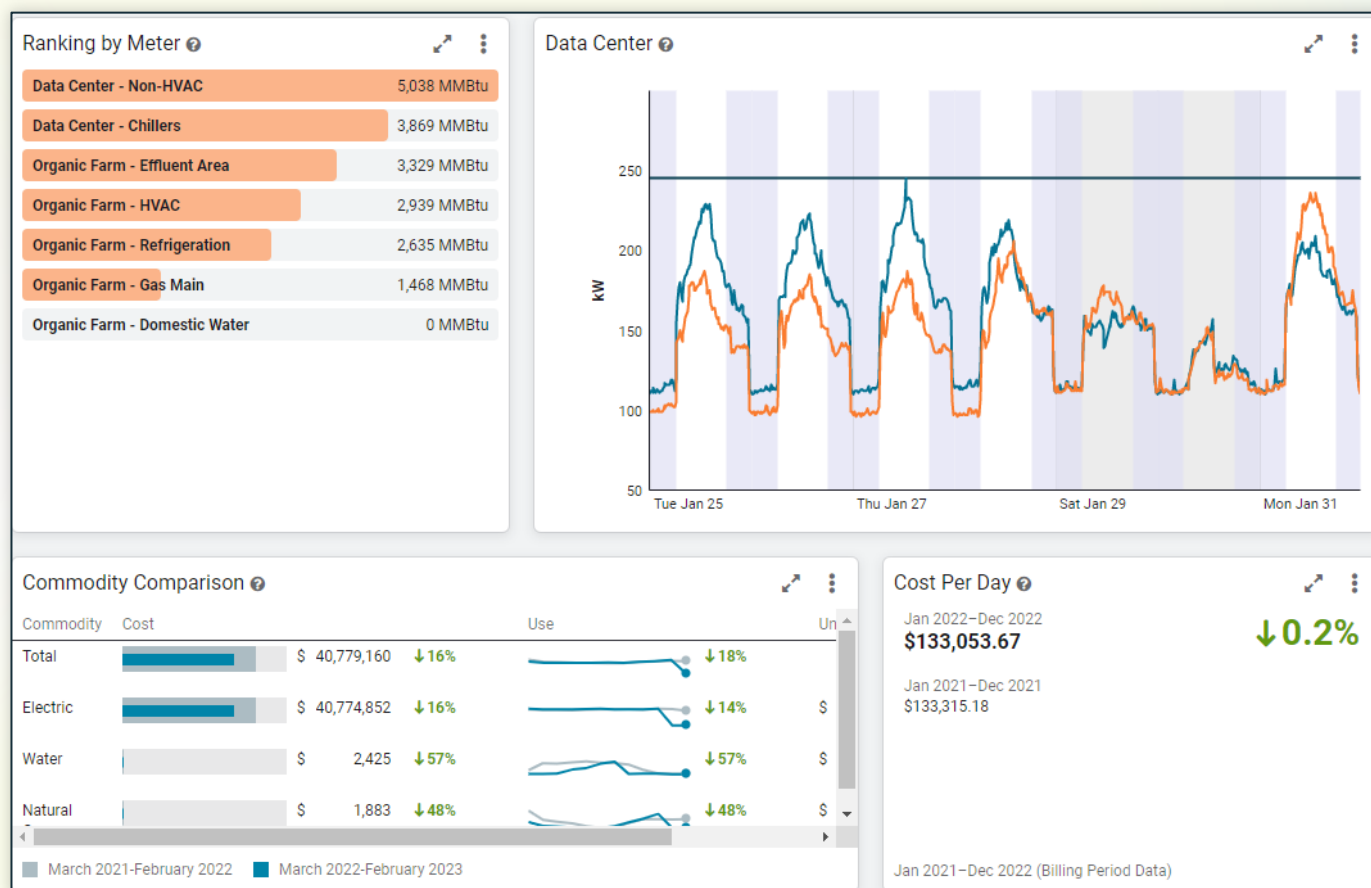


Public links and embeddable



# Powerful Dashboards

Combine data from both systems to display both monthly and real-time



# CATALYST

**Thank you!**