

# CATALYST



## Deep Dive into Interval Data: Unlocking Granular Insights for Smarter Energy Management



**John Heinz**

VP of Strategic Relationships  
EnergyCAP

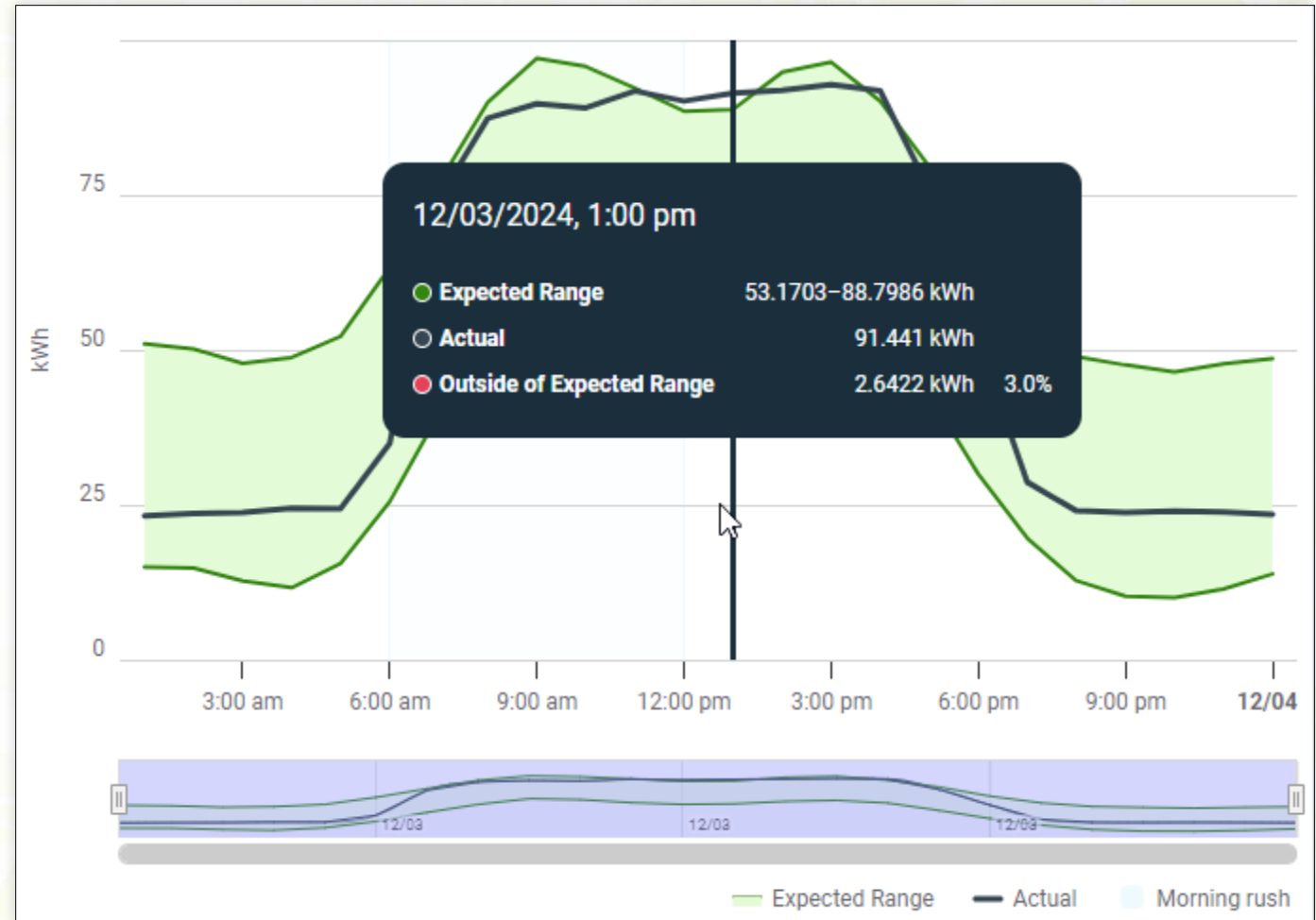
# Agenda



- ✓ Value of Interval Data
- ✓ Bill Data vs Interval Data
- ✓ Capture, Monitor, Save
- ✓ Introducing Smart Analytics
- ✓ Interval Data Insights
- ✓ Connectivity Options

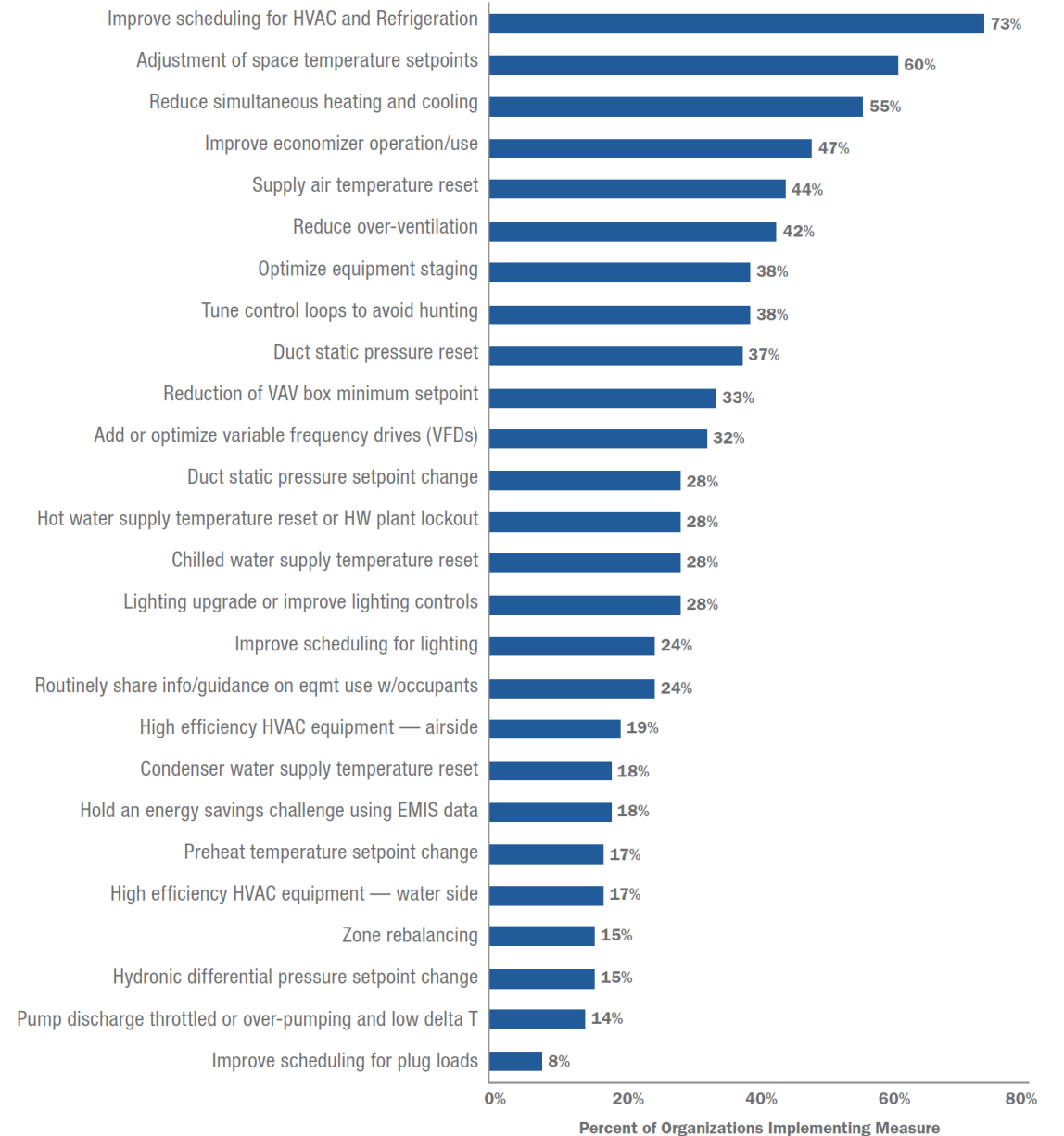
# Value of Interval Data

- Save you money by quickly spotting facility, scheduling, and equipment management problems.
- It's your eyes and ears, working 24/7, monitoring energy usage.
- Help you achieve savings by optimizing your building performance.
- Reduce utility bill cost by better demand management.

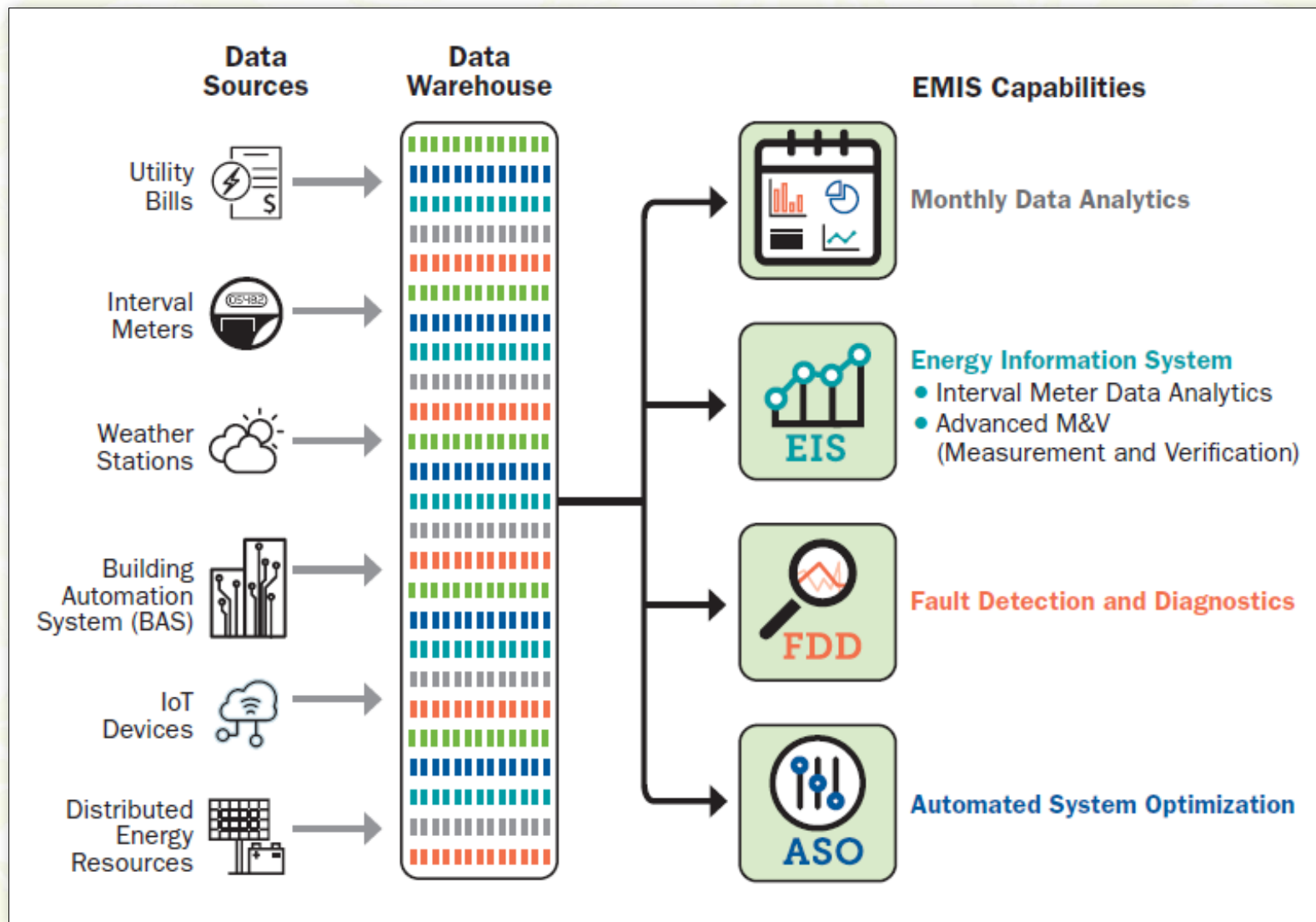


## Use it to spot...

- Equipment cycling on and off, dramatically reduces life
- Too early startup schedule
- Too late set back schedule
- Costly concurrent peak demand issues
- Inefficient custodial crew workflow
- Weekend and holiday savings opportunities
- Utility theft
- Wasteful HVAC control procedures
- And much more....



# Data inputs and key capabilities

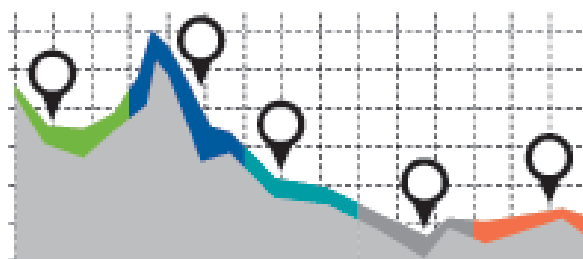


# Support options for the ongoing use of EMIS



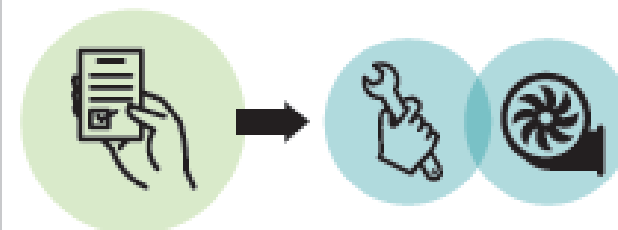
## EMIS Installation and Commissioning

- Integrate data from a variety of sources
- Check data quality
- Develop diagnostic rules
- Configure EMIS user interface



## Ongoing EMIS Data Review

- Prioritize findings
- Review BAS data to determine root cause
- Develop summary reports and action plans



## Corrective Action and Verification

- Troubleshoot issues onsite
- Track corrective actions
- Verify faults have been corrected
- Estimate energy and cost savings

# Bill Data vs Interval Data

## Utility Bill Data

- 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

## Smart Meter Interval Data

- 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

# EnergyCAP— expert-driven energy management

## Utility Management

the core of your energy management platform

### Trusted, centralized data

Rely on accurate, validated data housed in a single intuitive platform.

### Save time and cost

Eliminate errors, drive cost avoidance, and reinvest time and dollars back into your organization.

### Conserve resources

Turn quick wins into lasting impact with measurable results that showcase your team's value and energy project success



### Carbon Hub

#### Financial-grade carbon accounting

Seamlessly manage Scope 1, 2, and 3 carbon accounting from the same single source of truth as your energy data.



### Smart Analytics

#### Granular, actionable insights

Leverage predictive analytics and interval data to address issues early before costs escalate.



### Advanced utility data management

#### Accounting, Chargebacks, and BI reporting

Unparalleled financial clarity and control with bespoke functionality for finance teams.

## CAPture Services

Bill CAPture, Audit and Vendor management, and EnergyCAP Bill Pay

# Smart Analytics // Real-time energy and sustainability analytics

## Capture

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

▼ Science Center

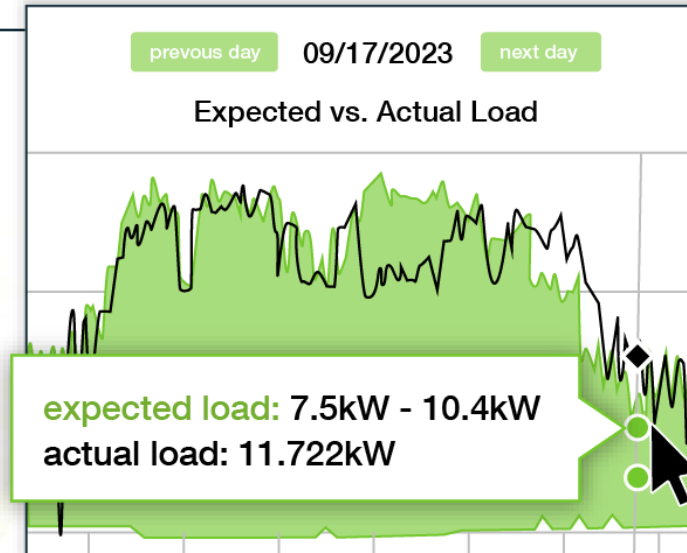
- Air quality
- ⚡ Air handler
- ⚡ Boiler
- ⚡ Water
- ⚡ Chiller
- ⚡ Production output (generic)
- ⚡ **Pump**
- ⚡ Solar
- ⚡ EV charger
- ⚡ Daily visitors

Hierarchy

Groups

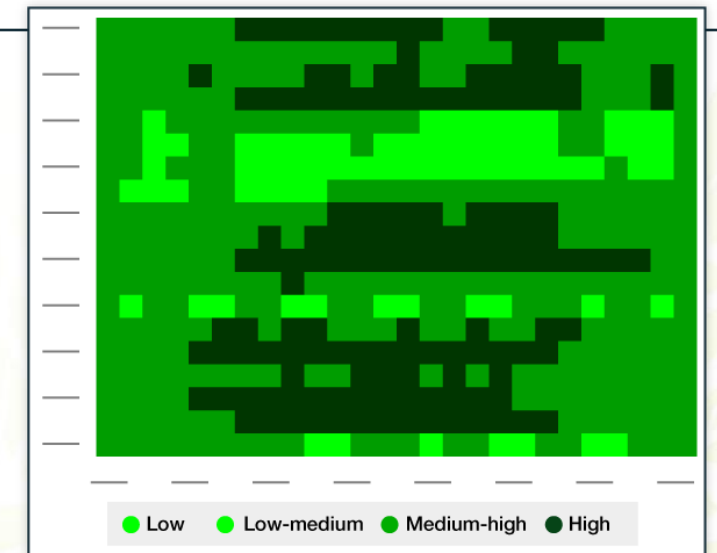
## Monitor

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

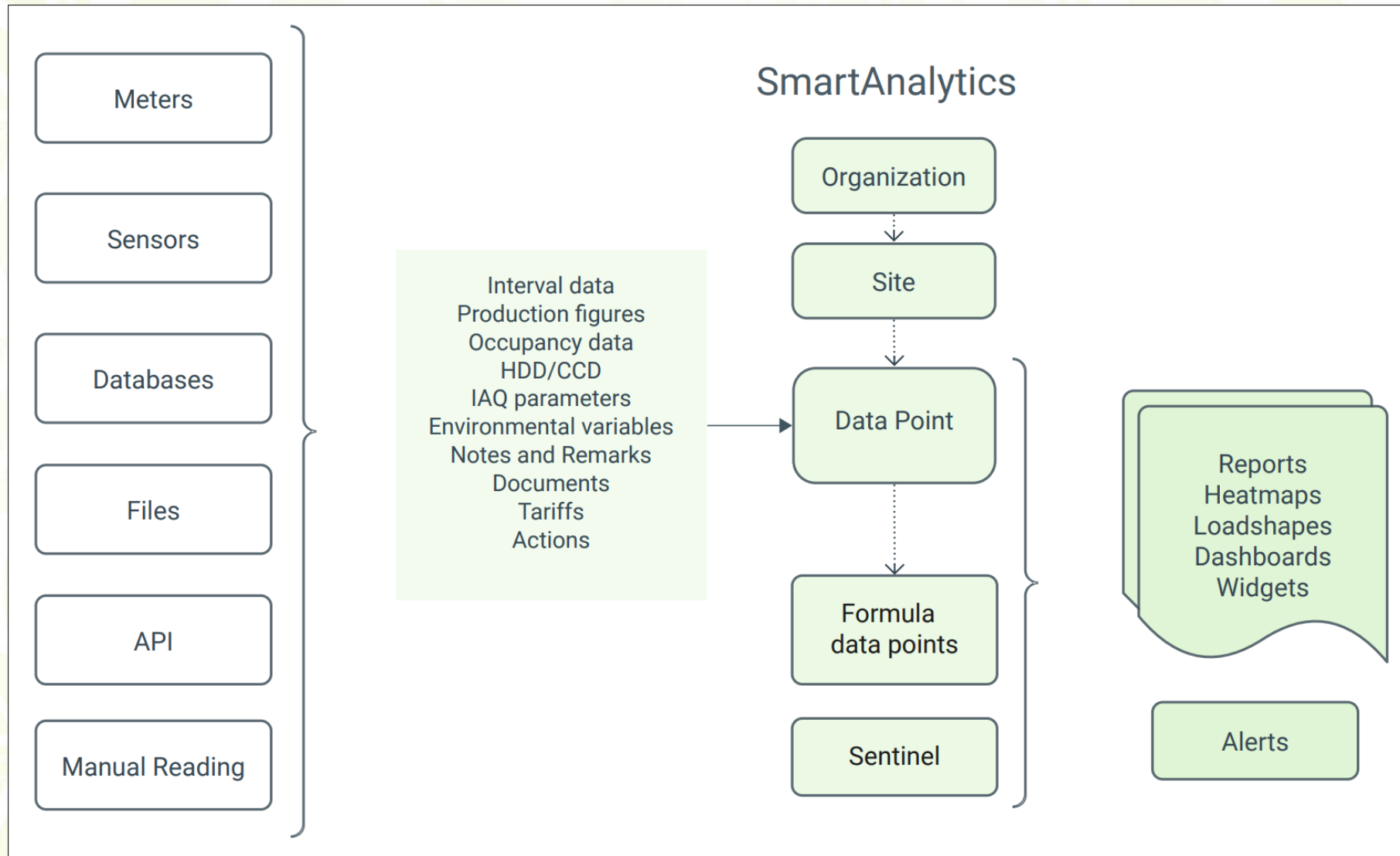


## Analyze

Access robust analysis and reporting functionality.



# Data Elements



# Insights // Readings

**New Channel**

CancelSave

Type ⓘ

Use▼

Interval ⓘ

5-minute▼

Name ⓘ

Use : 5-minute

Summarization method ⓘ

Sum▼

Channel import ID ⓘ

☒ Is Primary Value ⓘ

Description

☐ Channel is calculated ⓘ

Trip

Odometer

Difference between readings ×  1 = kWh▼

Rollover value ⓘ

9999999999999999

Rollback allowance ⓘ

10 %

☒ Final value is always positive ⓘ

Minimum computed reading ⓘ

Maximum computed reading ⓘ

- Channels track outputs/parameters your meters are capturing like demand, power factor, voltage, current, temperature, pressure, flow rate, etc
- Setup Trip or Odometer readings
- Account for multipliers, meter rollovers, summarizations, calculations
- Create custom fields on Channels for additional customization

**Edit Custom Fields for Channels**

CancelSave

Type	Label	Description	Important ⓘ	Use ⓘ	+
PDF	Device manual	Add description			

Yes/No

Integer

Text

Decimal

Date

List

Web URL

ADVANCED

Formatted text

Image (.jpg, .png, .svg, .heic, .gif)

# Insights // Readings

View and analyze readings. Take action to update and manage data. Process to estimate missing data.

Channel

Channel type

Interval

Timestamp

Search

Search

All intervals

Filters<sup>0</sup>

Reset

Source Readings (Count: 70252)

Sort

Actions▲

1 readings selected

Delete

☒

Demand : 15-minute

Demand

15-minute

12/31/2024 11:30:00 am

59731.166666666664

☐

Demand : 15-minute

Demand

15-minute

12/31/2024 11:45:00 am

61691.966666666674

61691.966667

W

☐

Demand : 15-minute

Demand

15-minute

12/31/2024 12:00:00 pm

59496.03333333333

59496.033333

W

☐

Demand : 15-minute

Demand

15-minute

12/31/2024 12:15:00 pm

59332.833333333336

59332.833333

W

☐

Demand : 15-minute

Demand

15-minute

12/31/2024 12:30:00 pm

60867.266666666666

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15-minute

12/31/2024 12:45:00 pm

60885.233333333334

60885.233333

W

☐

Demand : 15-minute

Demand

15-minute

12/31/2024 1:00:00 pm

60085.199999999999

60085.2

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Demand : 15-minute

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15-minute

12/31/2024 1:15:00 pm

60188.4

60188.4

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Demand : 15-minute

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15-minute

12/31/2024 1:30:00 pm

61147.366666666667

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Demand : 15-minute

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15-minute

12/31/2024 1:45:00 pm

60491.166666666664

60491.166667

W

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Demand : 15-minute

Demand

15-minute

12/31/2024 2:00:00 pm

60687.5

60687.5

W

☐

Demand : 15-minute

Demand

15-minute

12/31/2024 2:15:00 pm

61085.366666666666

61085.366667

W

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Demand : 15-minute

Demand

15-minute

12/31/2024 2:30:00 pm

60601.366666666667

60601.366667

W

☐

Demand : 15-minute

Demand

15-minute

12/31/2024 2:45:00 pm

61420.5

61420.5

W

1

2

3

4

5

6

7

8

9

10

...

1-50 of 70252 records

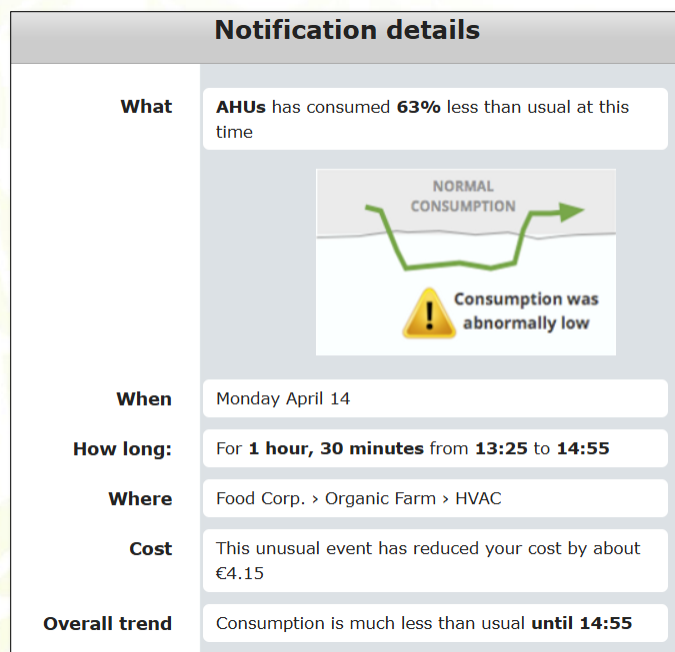
Reading:

E

Estimated

# Insights // Alarms

- Alarms and alerts provide informative and actionable insights, “audits” for meter data
- Set thresholds to alert you of potential spikes
- Define when and how you want to receive notifications



**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

## Insights // Alarms

- On active power (kW) to keep demand under control
- On currents (A) to prevent overheatings
- On voltages (V) to ensure power quality
- On consumption (kwh) over a certain time period
- Smart Sentinel alerts
- Alarms for offline meters and failed import processes

Monitored Point Floor 1

Notifications ☒ Home Page

☒ Email

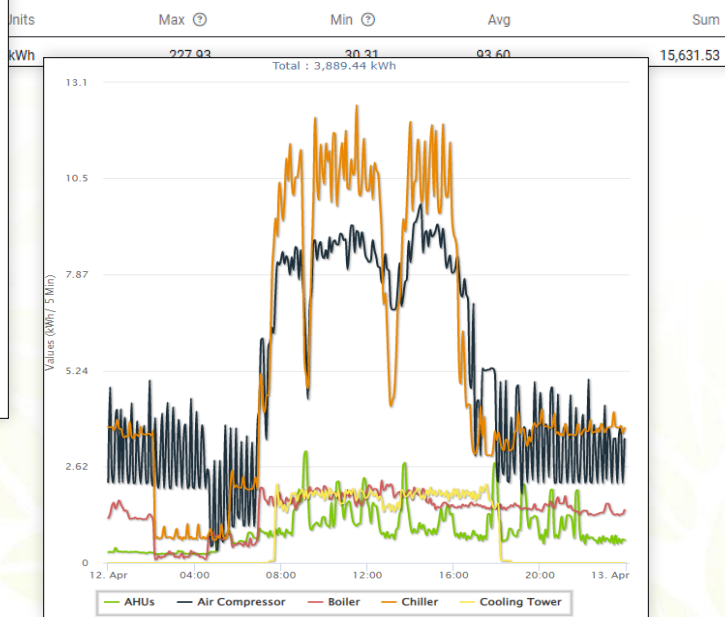
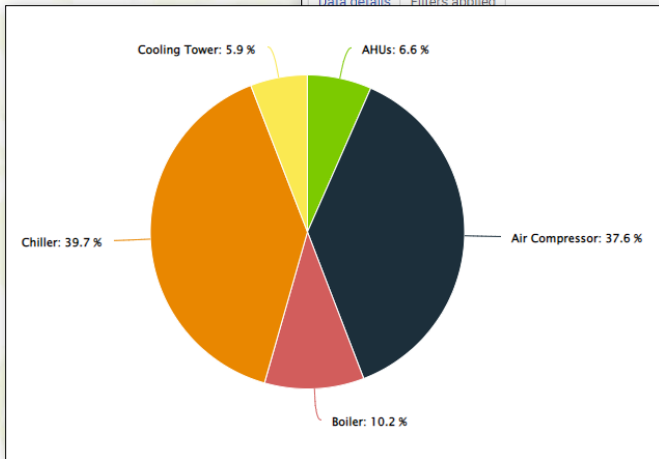
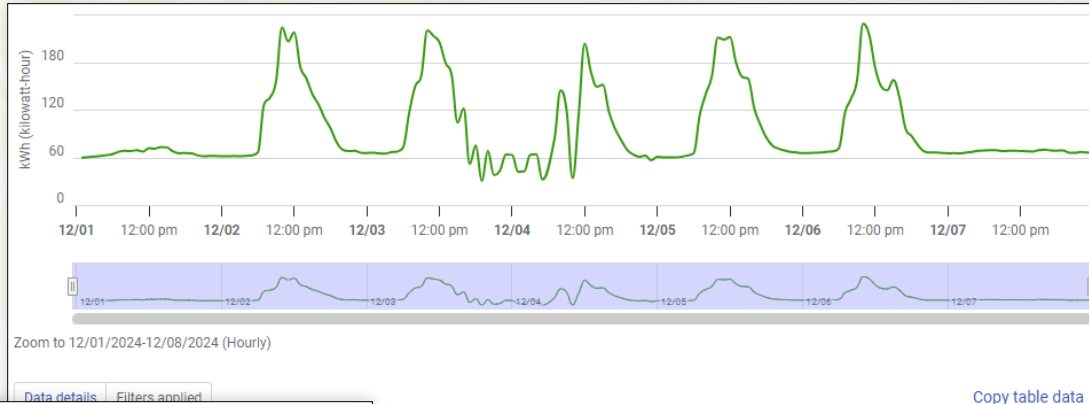
☐ SMS (You don't have your mobile number set., [add it](#))

You will be  
alerted

Trigger when  
reading

Threshold   kW ?

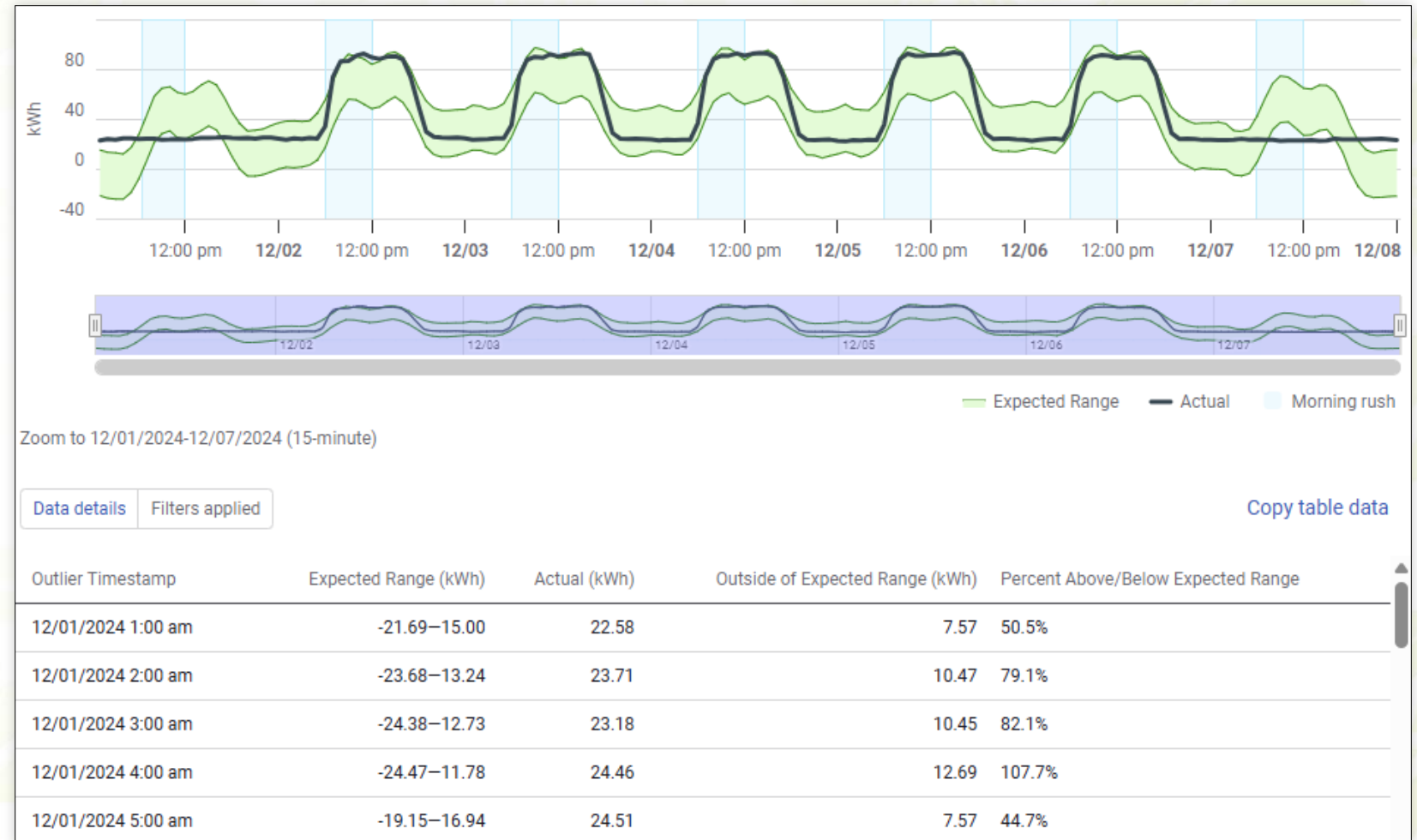
# Insights // Trends



- Daily, weekly, monthly, quarterly, yearly, rolling periods, and specified ranges
- Use, demand, cost, formula comparisons
- Aggregate, compare, isolate
- Determine what zone, equipment, time of day, day of week is causing the spikes
- Overlay multiple points to compare, helpful when monitoring equipment (HVAC, Chillers, Refrigeration, etc.)
- Depends on level of metering

# Insights // Trend Insights - Machine Learning Predictions

- Forecasts your range based on historical data and becomes more accurate over time as more data becomes available.
- Set and receive alerts for data out of range.
- Actual demand or use values are overlaid with a model of the forecasted range.



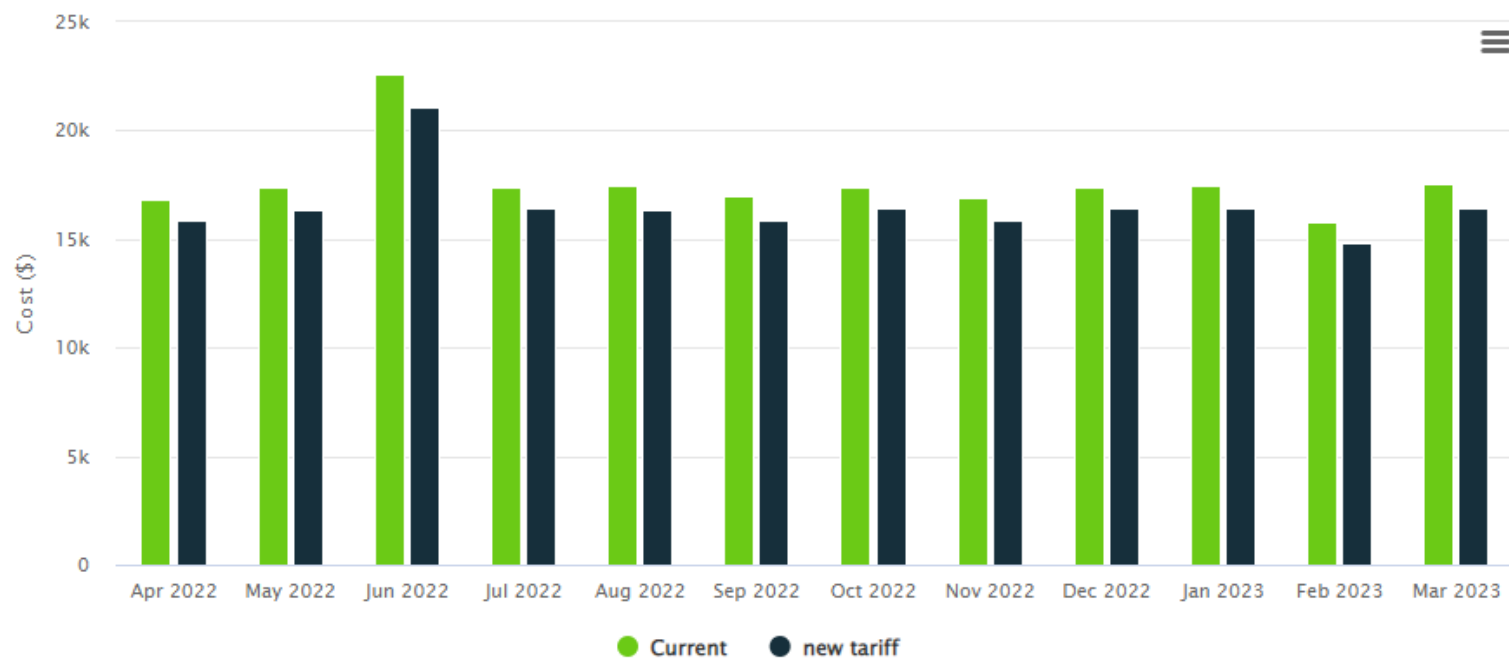
# Insights // Tariff Analysis

## 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>



# Insights // Tariff Analysis

- 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

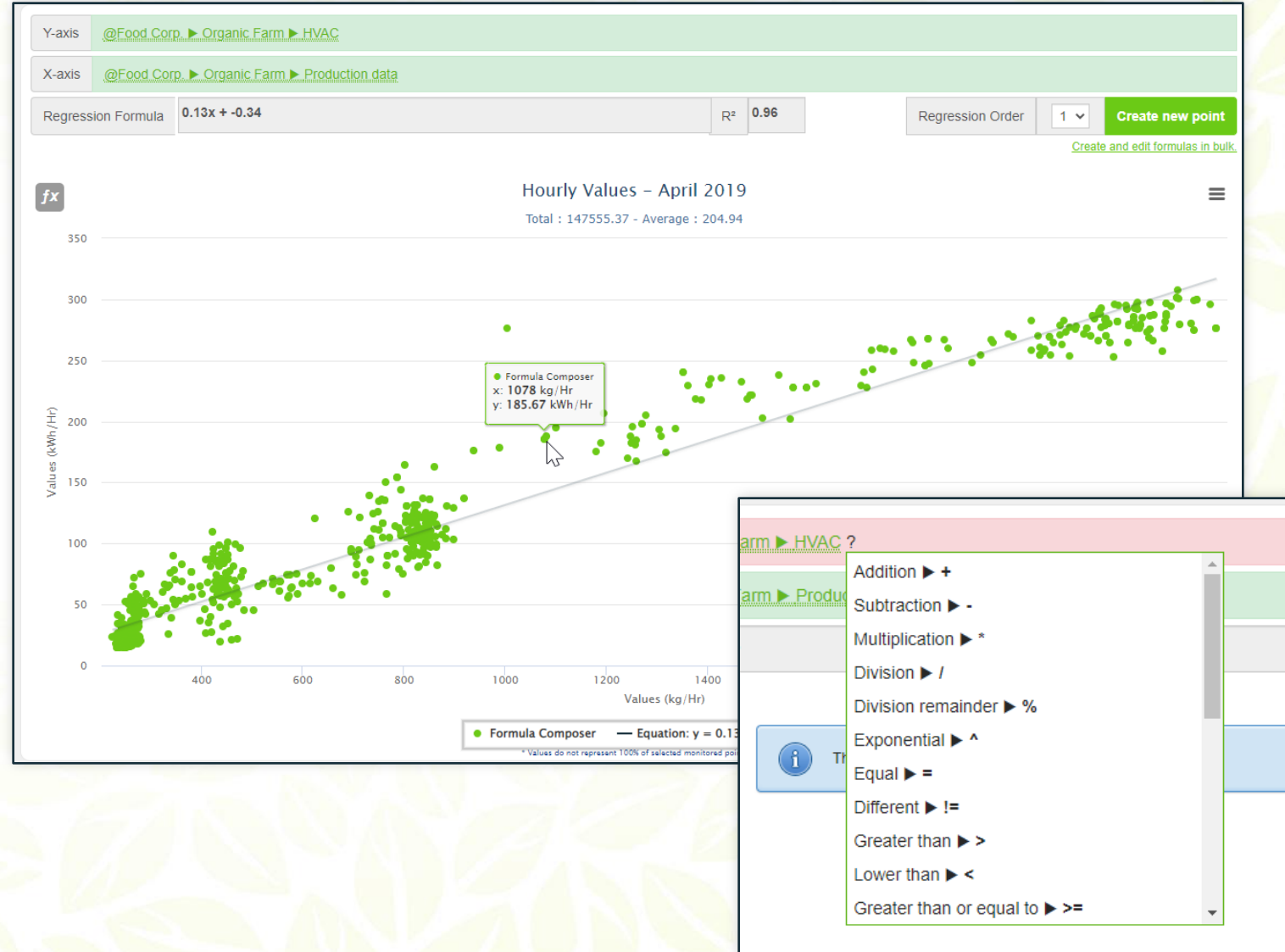
Jan 1st to Dec 31st

+ 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

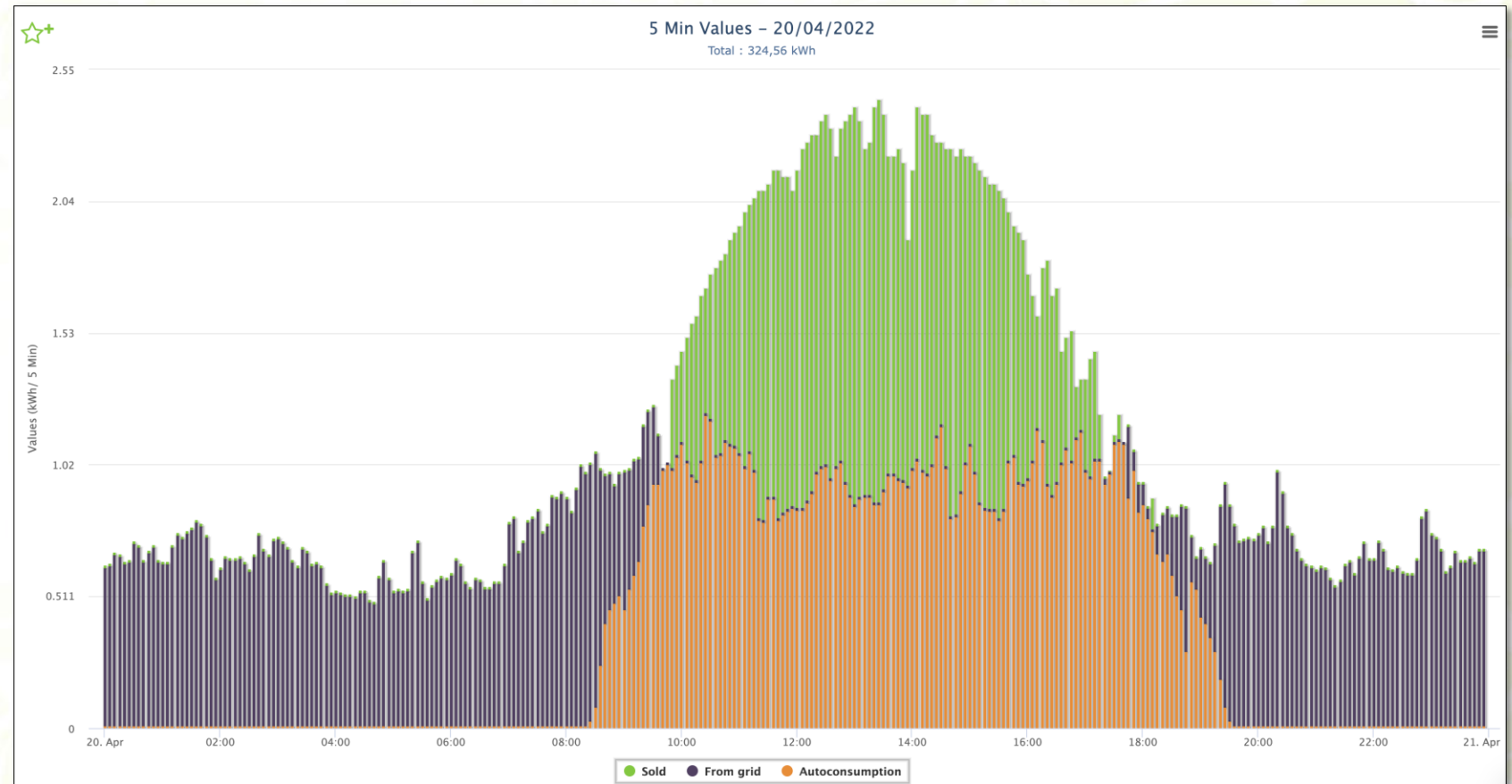
# Insights // Comparative Formulas and Correlations

- Formulas to compare, aggregate, reduce, create targets, and more
- Formula points function like metered points, have sentinel, alarms, alerts, heatmaps, etc.
- Ensure that consumption is in line with working hours
- Assess trends of EUI metrics like consumption per m<sup>2</sup>, occupancy or production output
- Ensure that energy consumption is in correlation with production data
- Create models to predict future energy usage



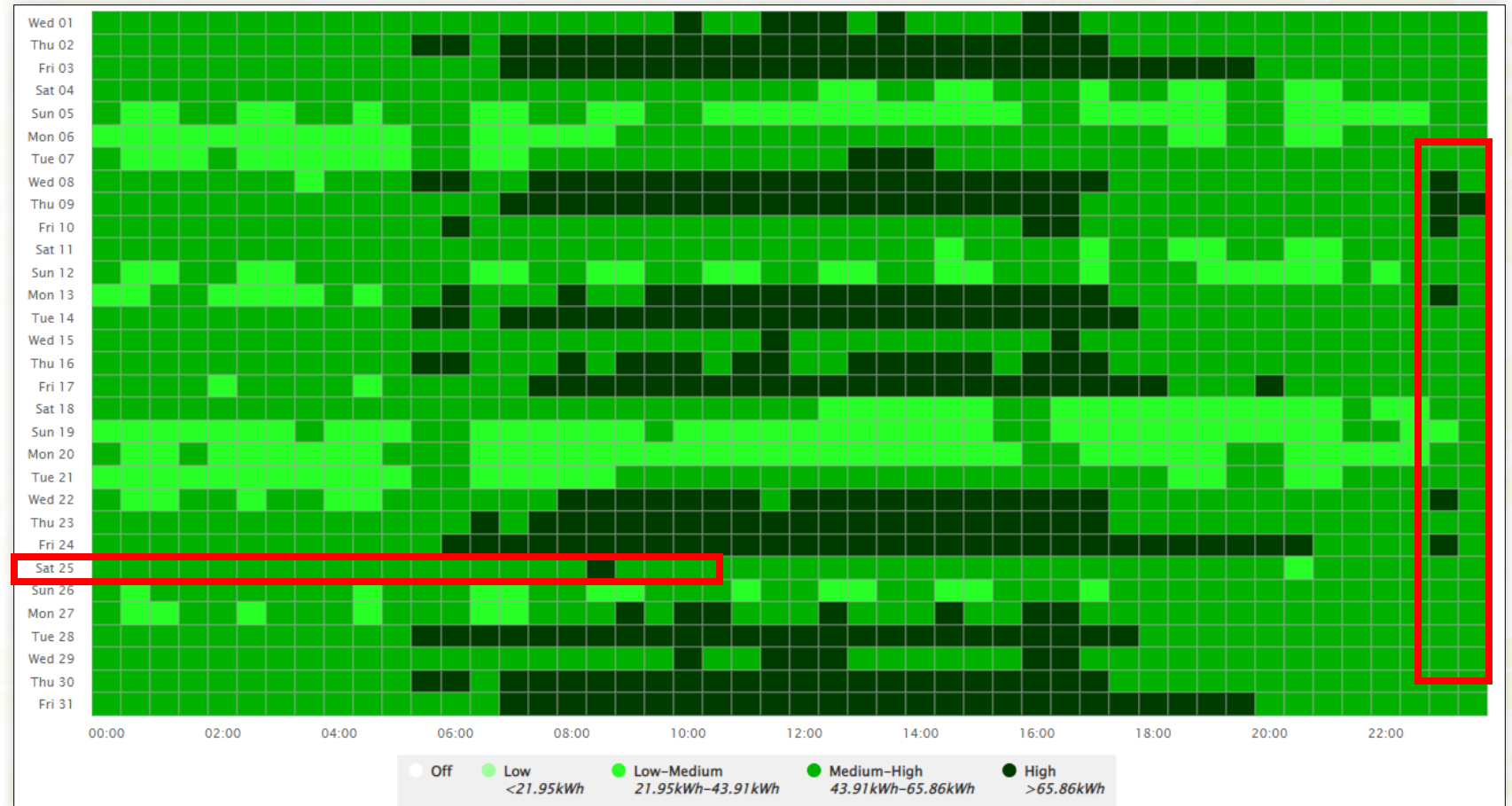
# Insights // Understand Consumption Sources

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



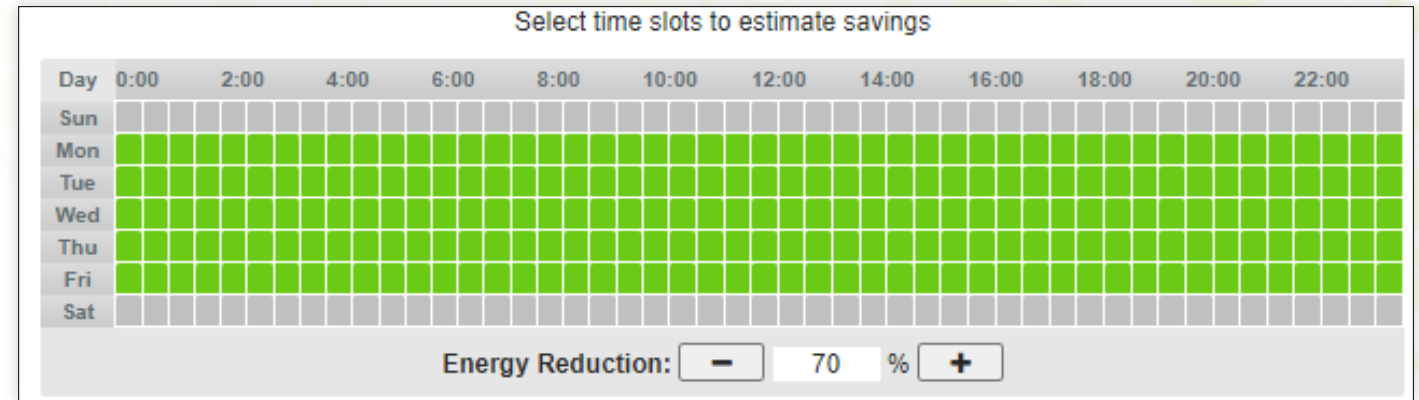
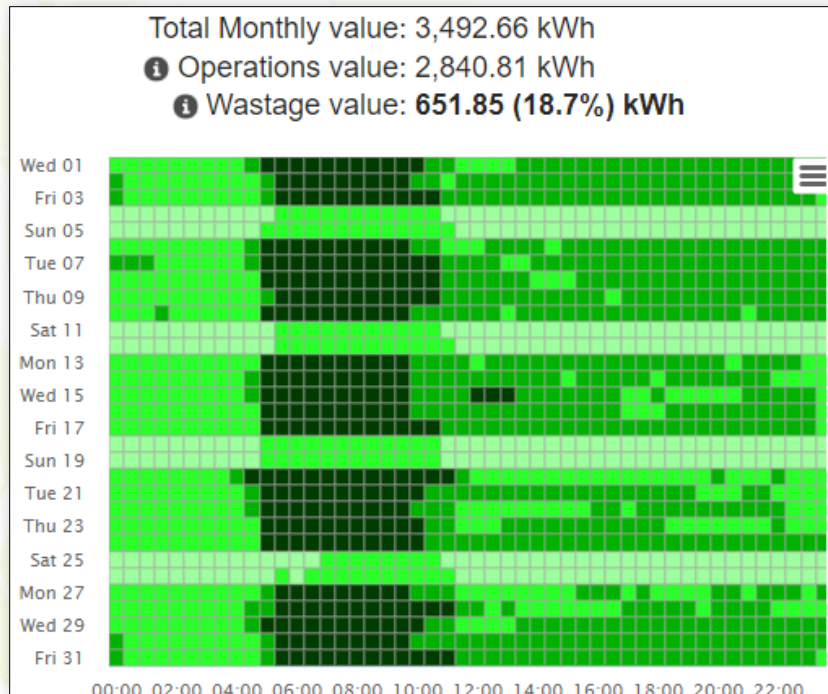
# Insights // Heatmaps

- 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



## Insights // Schedule Optimization

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

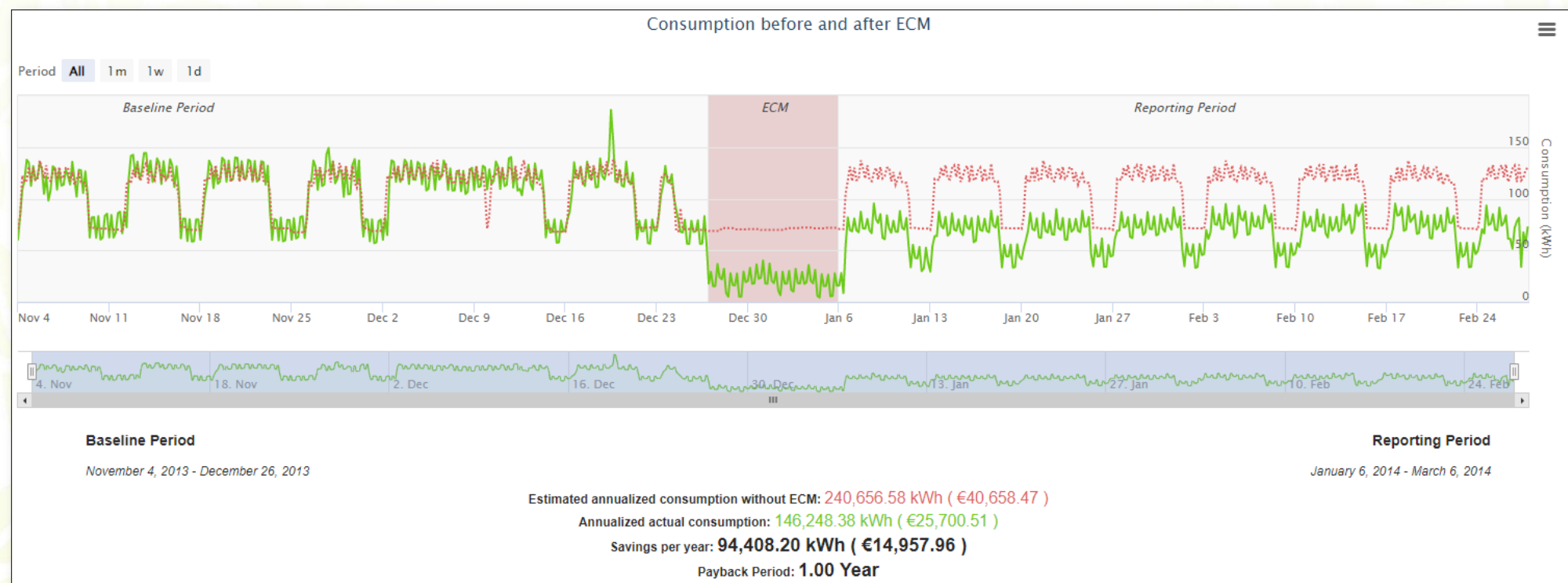


Heatmaps to simulate and visualize time periods of intensive usage and what the new schedule would look like

Calculate projected use and cost savings by making reduction changes

# Insights // Verify Savings

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



# Insights // Create Bills

## Bill Calculation Versions

0103000E

Original Calculate bills using workflow step 1 PSU UP Monthly Billing Workflow: Calculate Metered Bills from Interval Data ELECT E&G

Use (Channel readings)



15-minute / Use

Cost (UPELECTRICE&G)



Use x UPELECTRICE&G

Demand (Channel readings)



15-minute / Demand

Other meter lines



Not configured

Other account lines



Not configured

### OPP Utility Services - Electricity

Account number  
0103000E

Statement date  
4/18/2025

Services from  
10/25/2024-11/25/2024

### OPP Utility Services - Electricity

0103000E  
University Park, PA 16802

**\$ 3,666.18**

Accounting Period 05 2025 Bill ID 761670 Billing Period Nov 2024

### 0103000E01 [0103000E01]

Electric Rate UP Electric E&G Serial # 460122599

Calculated Use From Readings 29,349.64 kWh

Cost: \$0.1168/kWh \$3,428.04

Calculated Use and Cost 29,349.64 kWh \$0.117/kWh \$3,428.04

Peak Demand from Readings 49 kW

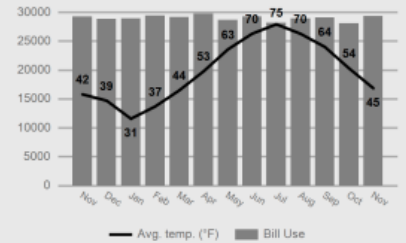
Cost: \$4.86/kW \$238.14

Calculated Demand 49 kW \$4.860/kW \$238.14

**Subtotal 29,349.64 kWh \$0.125/kWh \$ 3,666.18**

\* Informational

### BILLS BY BILLING PERIOD



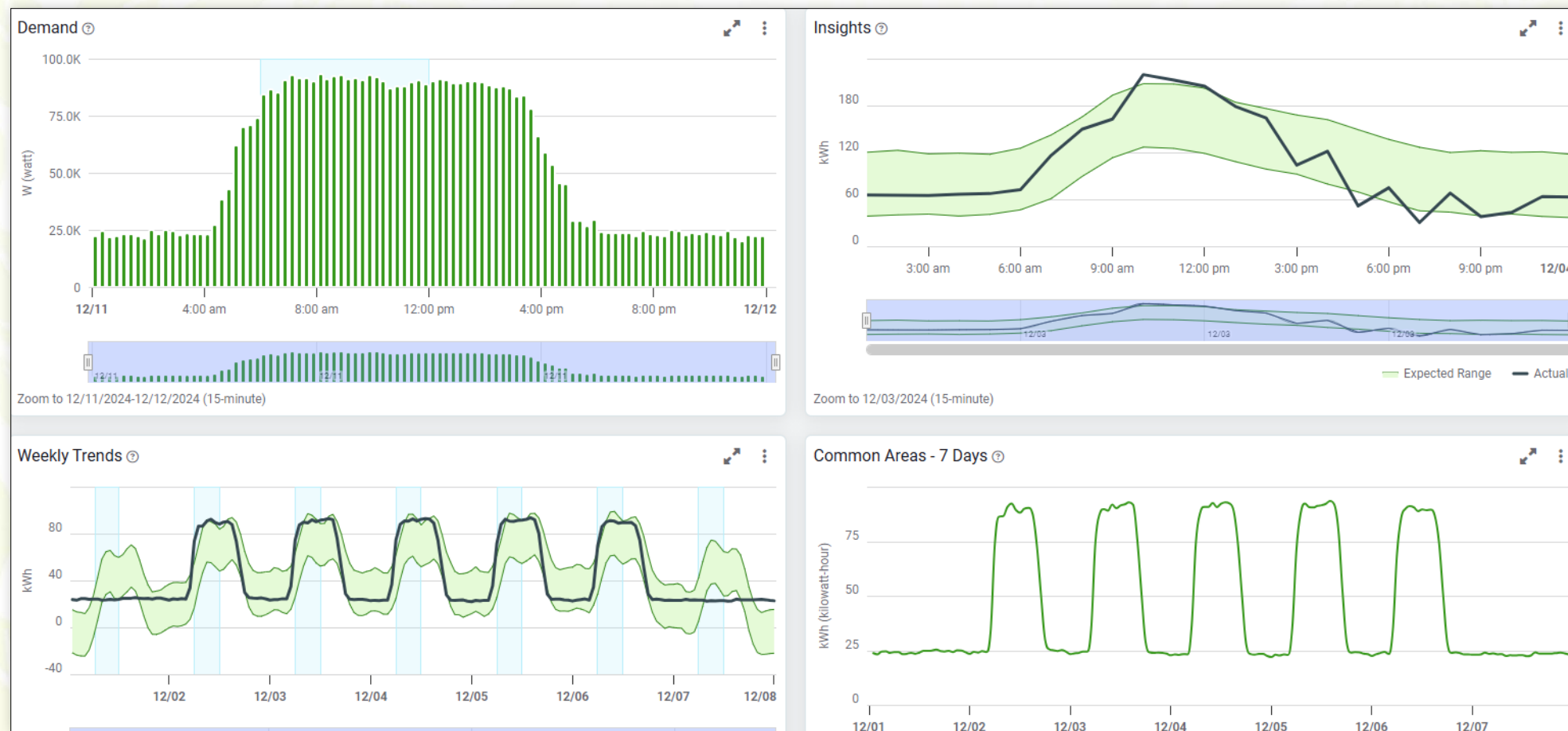
	Sep 2024	Oct 2024	Nov 2024
Use	29,087 kWh	28,097 kWh	29,350 kWh
Demand	52 kW	52 kW	49 kW
Charges	\$3,650.11	\$3,534.42	\$3,666.18
	\$0.125/kWh	\$0.126/kWh	\$0.12/kWh

**Total**

**\$3,666.18**

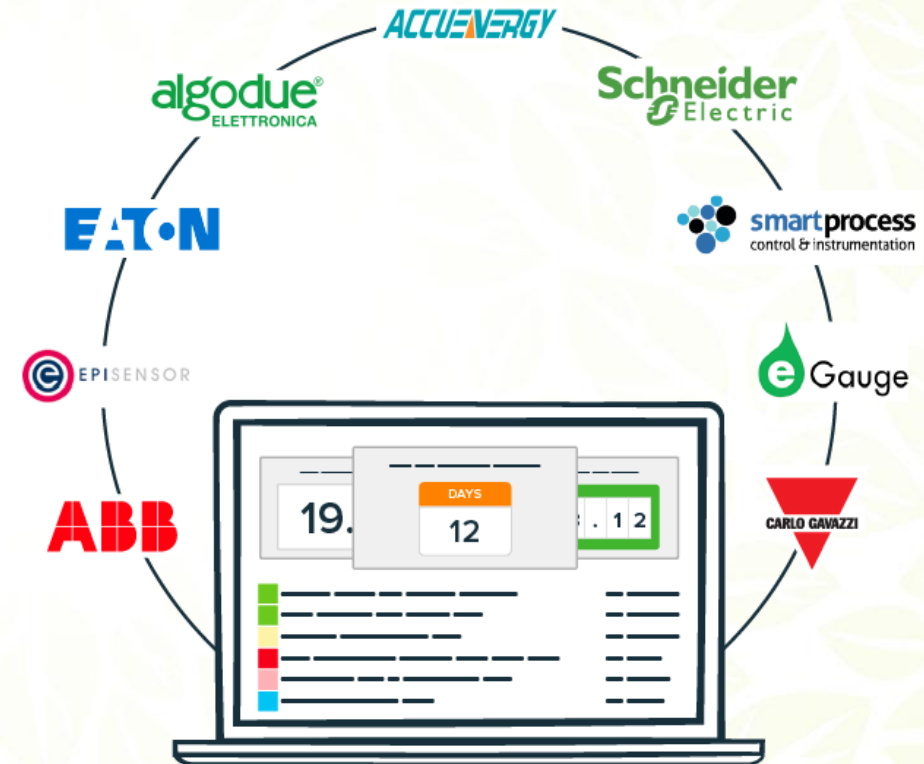
# Insights // Dashboards in Real-time

New widgets available in addition to all the existing bill data widgets.



## Connectivity // Partnerships with hardware and installation vendors

- EnergyCAP is hardware agnostic
- Remove the guesswork of formatting and connectivity
- Many options available to meet your monitoring needs
- “Plug and Play” ready
- Options for meters, sensors, and gateways for communication
- Options for communication protocols (BACnet, Modbus, etc.)
- Partnerships with onsite meter installers



## Partner spotlight // Episensor



Gateways

Demand Response Controllers

Electricity Monitor

Wireless Signal Sensor

Wireless Temperature Sensor

**<http://www.Episensor.com>**

## Partner spotlight // Accuenergy



Power Meters

Current Transformers

Communications-Gateways

Panels

<http://www.Accuenergy.com>



## Partner spotlight // Mad Dash



Hardware installations

Meter data validation

Surveys and recommendations

AMI remediation

**<http://www.Maddash.com>**

# CATALYST

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for this session in the **Sched app**.

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