ENERGYCAP®

Reduce Costs and Comply: Energy Management Strategies for EU Retailers and Commercial Organisations

Agenda

- Speaker intros

- Understand the regulatory landscape in the UK and EU

- How to get started with Energy Monitoring

- Real-world success stories

- Dig deep into energy data to drive results

Speakers

Cristina Coffrey
Chief Strategy Officer
EpiSensor

Aref Abouzahr
CEO and Founder
Ark Energy

John Heinz
VP of Strategic Partnerships
EnergyCAP

Understand the regulatory landscape in the UK and EU

Leveraging Directives and Certifications

Drive energy efficiency and sustainable building practices.

	Regulation/Certificate	Category	Description
	EU Energy Efficiency Directive (EED)	Regulation // Energy Audits	Promotes energy efficiency across sectors, mandates energy audits, and sets efficiency targets
	Corporate Sustainability Reporting Directive (CSRD)	Regulation // Energy Audits	Enhances transparency in non-financial reporting, including detailed energy consumption reporting
	EU Building Performance Directive (EPBD)	Regulation // Building Efficiency	Focuses on improving energy performance of buildings through standards, certificates, and renovations
	Energy Savings Opportunity Scheme (ESOS)	UK Regulation // Energy Audits	Mandatory energy assessment scheme in the UK for large organizations, promotes energy efficiency audits
	LEED Certification	Sustainability Certification	Globally recognized for green building standards, encourages sustainable site development and efficiency measures
	BREEAM Certification	Sustainability Certification	Evaluates sustainability performance of buildings, provides a framework for improvement
	BCORP Certification	Sustainability Certification	Certifies companies meeting high social and environmental standards, including energy efficiency

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Meeting essential energy efficiency standards, ensuring regulatory compliance, and promoting sustainable building practices through directives and certifications

Climate Regulations FAQs
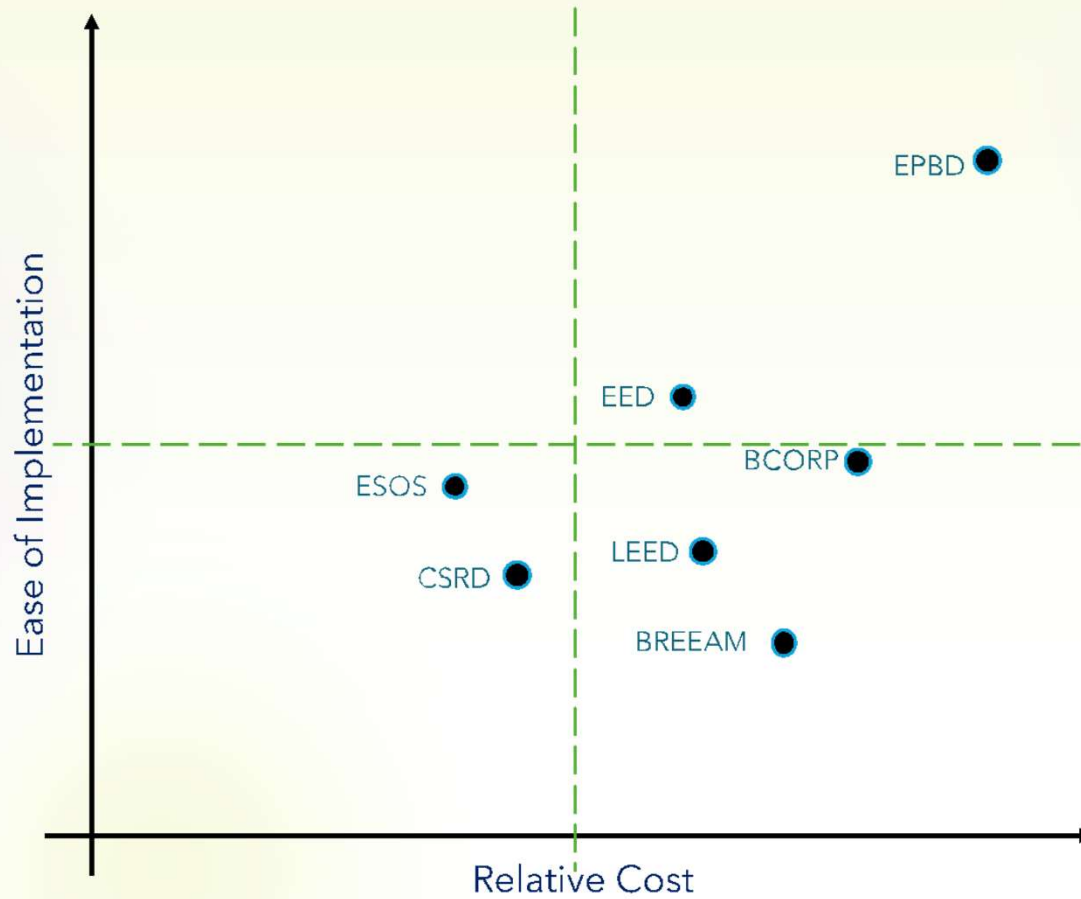
Aligning with key directives and certifications ensures compliance, enhances building performance, and promotes environmental responsibility
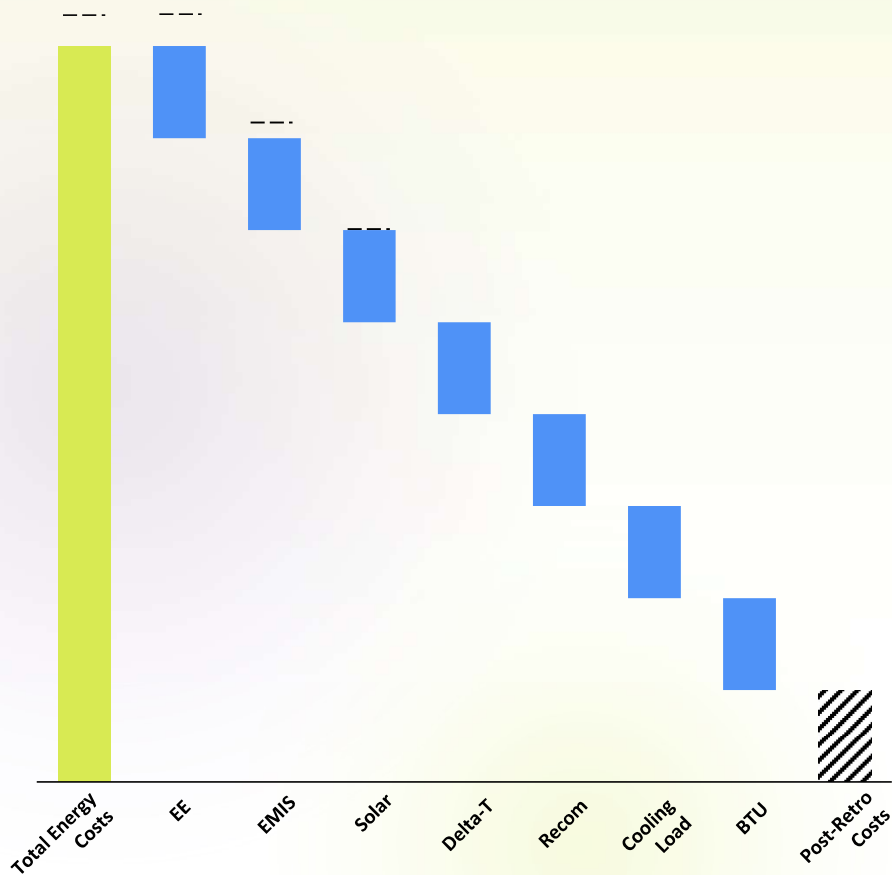
Opportunity	Impact	Directive/Certificate
Energy Efficiency Retrofit	Cut down on energy spend by 15–40%	EED, EPBD, BREEAM
Digital Energy Management Platform	Provide actionable insights and energy/carbon reporting using data analytics and digitalization	ESOS, EED
Submetering	Monitor and conserve resource consumption and usage-based	EED, LEED
Solar Rooftop	Reduce energy costs and carbon emissions thru renewable energy	BREEAM, LEED
Low Delta-T Rehabilitation	Eliminate Low Delta-T penalties and improve standards of comfort	EED, EPBD
Recommissioning	Improve building performance	LEED, BREEAM
Thermal Cooling Load Assessment	Reduce DC Declared Load and optimize chiller capacity	ESOS, EED

Getting started with energy monitoring

Considerations when Implementing an Energy Monitoring System

Planning and design:

- User experience

- Required expertise

- What comes in the package

- Operating environment (indoor vs outdoor)

- Extensibility (gas and water)

- What's possible vs what's economic

  - Utility meter access

- Value-add Opportunities

  - Environment optimisation

  - Equipment optimisation

- Flexibility

Integration:

- Energy Management Platforms – EnergyCAP

- Existing energy assets—Batteries and Solar PV
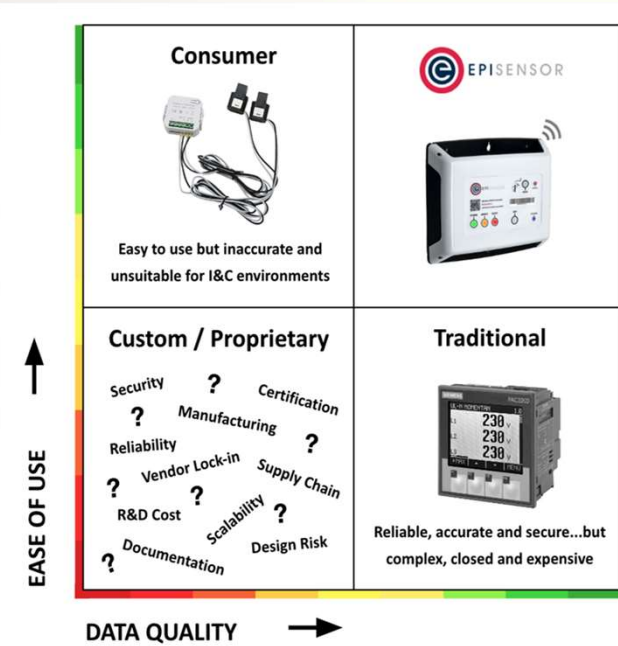
- BMS system

Training and maintenance:

- Operating/Maintenance manual

- Baseline analysis (KPIs)

- Highlight inefficiencies

- Action plan

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EPISENSOR

Overview // IoT infrastructure for the sustainable energy transition

Where do we fit in?

We combine the quality of traditional systems, with the ease of use of consumer systems, without the risk and cost of proprietary solutions
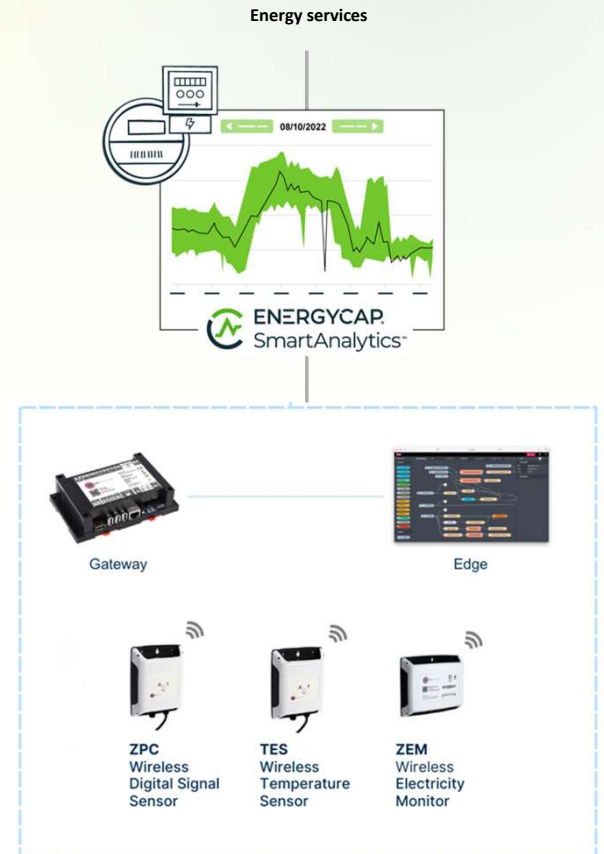

We sell via partners (Aggregators, ESCOs, SaaS, VAR's, etc) who deliver complete solutions for:

- Energy Management
- Demand Response
- Other energy-related IoT applications

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System Architecture

Success stories

Woodie's // Energy monitoring IOT solutions in retail

Objectives of EpiSensor IoT platform installation

- Capture detailed energy consumption for each store

- Identify high-energy consumption assets and electricity usage patterns

- Implement cost-saving measures

- Detect anomalies, causing to higher energy costs and maintenance challenges

Outcomes

- Site-specific alerts: Over 300 site-specific alerts to monitor energy usage and identify improvement opportunities for Woodie's.

- Data visualisation

- Addressing energy anomalies through real time energy data

- Reduced site-visits

3Arena // Ireland's largest entertainment venue slashes energy spend

Objectives of EpiSensor IoT Platform installation

- Get granular view of energy consumption throughout venue, and in specific areas.

- Identify venue energy consumption when dormant vs. at capacity, for cost management purposes.

Outcomes

- 6-figure energy savings annually (€1000 hourly)

- Optimized venue energy consumption.

- Implemented operational changes driven by granular data insights.

- Boosted sustainability - contributing to self-imposed environmental targets (leading to CSRD compliance).
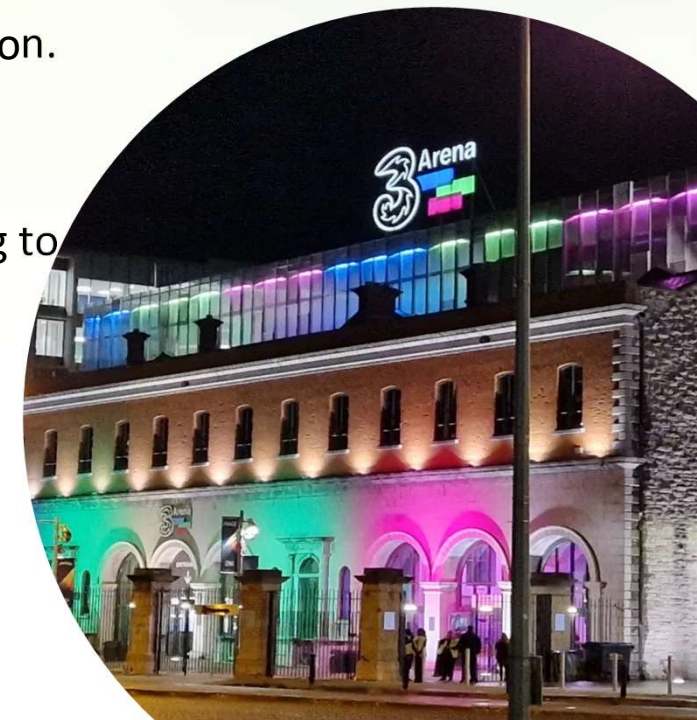
Value Added Opportunities // Optimizing cold chain operations and refrigeration

How Europe's largest retailers gain control of refrigeration temperature with EpiSensor IoT

About the project
- Two of Europe's largest supermarket chains.
- Refrigeration temperature optimisation across all stores.

EpiSensor IoT infrastructure facilitates

- Peace of mind in case of power outages in stores where generator back-up is unavailable.
- Monitor and calibrate fridge temperatures with a high level of accuracy.
- Reduce energy usage from refrigeration with no compromise to food safety.
- Remotely monitor live refrigeration temperatures and react quickly, as required.

About the project
- **Partner**: Inteligistics.
- **End Customer:** Driscoll's (the global market leader in Cold Chain operations for berry storage and logistics).

EpiSensor IoT infrastructure facilitates

- Granular data on temperatures and optimisation of cold storage through real-time monitoring and control.
- Remotely monitoring of facilities
- Temperatures monitoring in transit. Data continuously logged by TES - 2x during transport process, with data transmission on location to Gateways.

SmartAnalytics was selected to maintain over € 280k of savings a year at stake in independence from departing ESCO by integrating 150 data points

The client

Topology: Skyscraper

Application: Luxurious Residential

Location: Dubai Marina

Floors (Height): 44 (215 meters/705 feet)

Units: 159 unit

Energy Retrofit Project Status: Done

M&V Reporting Period Status: Completed

Savings Achieved: € 280k

The asks

Experience smooth transition of control of ECMs after ESCO's departure

Preserves energy savings

Receive transparent well-structured automated reporting

Monitor performance of energy assets

Provide and visualize live high-definition data trends

Benchmark and compare energy consumption trends

Outcome and benefits

€ 280k ENERGY SAVINGS
Savings have been preserved in lieu of connecting **SmartAnalytics**, coupled with a dedicated Energy Manager and Data Analyst to support on the analytics and continuous energy management and reporting with FM team

ONE UNIFIED INDEPENDENT PLATFORM
Connecting and ensuring independent streaming of data from all monitored circuits, mitigating data manipulation risk

150 DATA POINTS ANALYTICS – ISO 50001 ENABLED
Capturing and crunching high-frequency data of 15-mins interval using advanced analytics powered by AI and Machine Learning enabling consistent energy optimization and automated notifications, alarm triggers, anomalies and drift detection

1 BESPOKE CUSTOMIZED ENERGY, M&V, & CARBON REPORT
Customized report featuring sections on Meter Health Check, Incident Log, Measurement & Verification (M&V) report, Savings Opportunities, Energy and Carbon Accounting Report, and additional details

ENERGY SAVINGS INSIGHTS
Harnessing data analytics and drift alerts to proactively identify and quantify energy savings and carbon reduction opportunities to drive informed decision making for investments in conservation measures (ECMs)
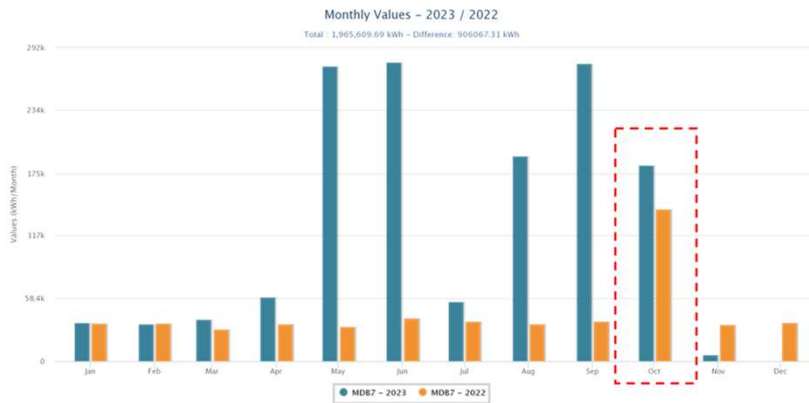
IMPROVING STANDARDS OF COMFORT
Helping the client improve their facility's standards of comfort by recommending low-cost no-cost energy savings operations
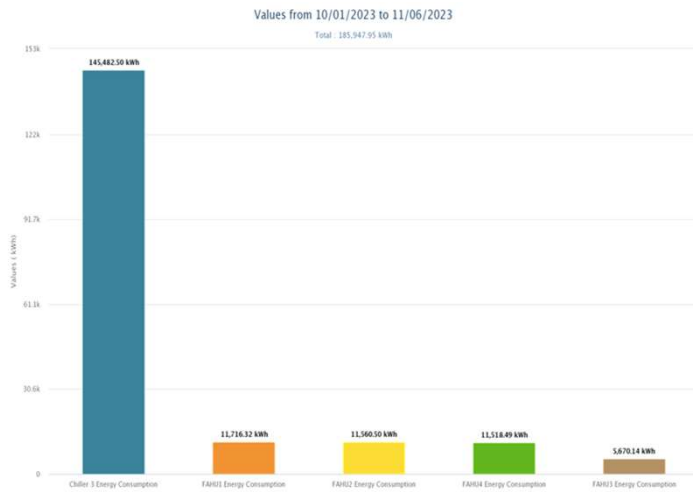
Investigating the reasons behind increased energy consumption compared to the previous year and assess the impact of higher ambient temperatures

Tracking Major Energy Consumers
Based on DEWA data, MDB7 exhibited the most significant increase in energy consumption during the period in question

Drilling Down into Consumption
Equipment Analysis: Detailed examination of the equipment connected to MDBs revealed that chiller 3 were operating more frequently correlating with the rise in overall energy consumption.

Investigating the reasons behind increased energy consumption compared to the previous year and assess the impact of higher ambient temperatures
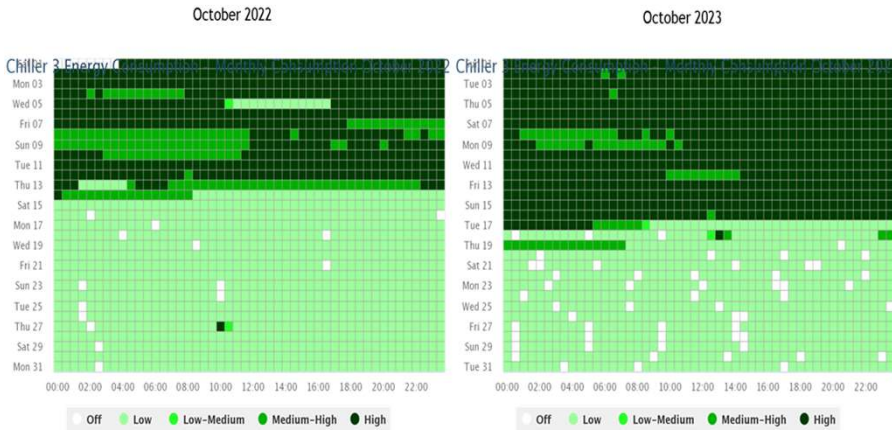
Operational Hours

The data indicates a substantial increase in the operational hours of the chillers, correlating with the rise in overall energy consumption. This suggests that the chillers are running more frequently or for extended periods, likely due to higher cooling demands or inefficiencies within the system.
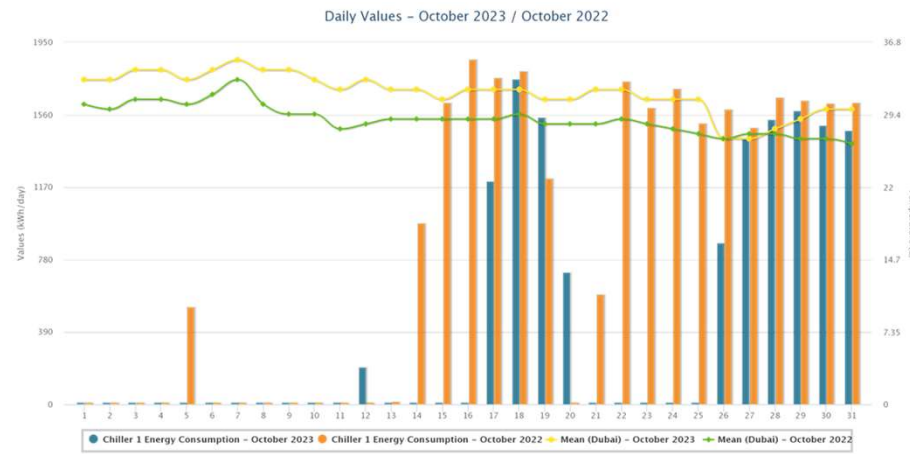
Ambient Temperature Impact

Temperature Data: Analysis of ambient temperature data showed an average increase of 2 degrees Celsius during the period in question compared to 2022.

Cooling Demand: The higher ambient temperatures required the chillers to run for extended periods to maintain the desired indoor climate, significantly contributing to increased energy consumption.
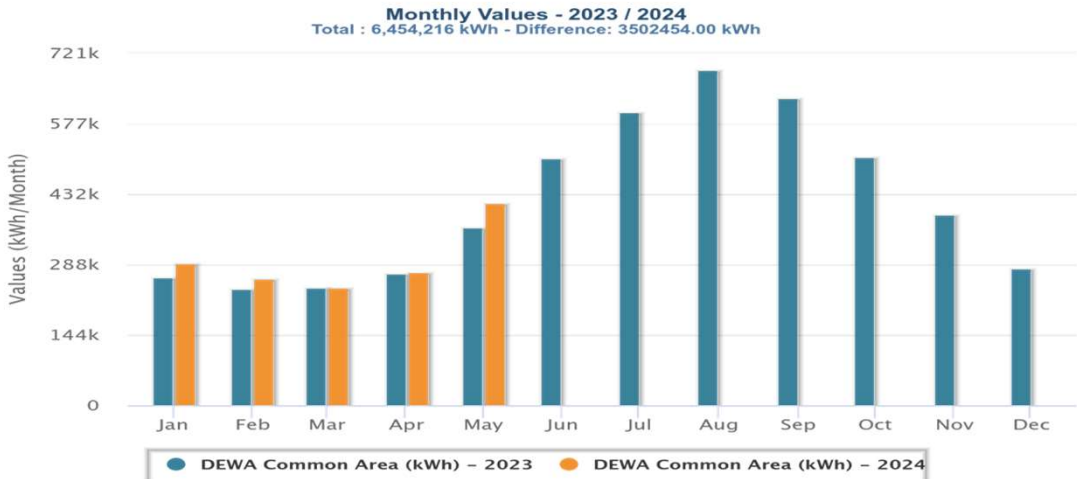
Tracking Scope 2 CO2 emissions and energy consumption through SmartAnalytics provides insights into efficiency opportunities and operational impacts at Al Seef

Table 1: CO2 emissions for the first five months of 2024 vs 2023

Months	CO2 Emissions (Kg)	Trend vs. 2023	
January 2024	117,437	↑	11.2%
February 2024	104,421	↑	8.6%
March 2024	97,182	↓	0.09%
April 2024	109,974	↑	0.98%
May 2024	167,241	↑	14%

Figure 1: Monthly CO2 Emissions from January 2024 to May 2024

Monthly Values - 2023 / 2024
Total : 6,454,216 kWh - Difference: 3502454.00 kWh

Legend: ● DEWA Common Area (kWh) – 2023   ● DEWA Common Area (kWh) – 2024

GHG Scope

The emissions reported fall under Scope 2 CO2 emissions[1], which include indirect emissions: for instance, the generation of purchased electricity, steam, heating, and cooling consumed by the building. Al Seef CO2 emissions are a consequence of the building's energy consumption as reflected in utility bills from January to May 2024, rather than direct emissions from on-site activities.

CO2 Emission Calculation

*CO2 Emissions=DEWA Consumption (kWh) * EF (kg CO2e / kWh) [1]*

Monitoring Through SmartAnalytics

SmartAnalytics enables accurate tracking of energy consumption and emissions, helping organizations to identify opportunities for improvement and efficiency.

(1) The emission factor used for 2024 is 0.424 kg CO2 for every 1 kWh (*Source: DEWA, Dubai Carbon*)

Faulty sensors are instantly detected and recommended for replacement while keeping track of these sensors on the sensor malfunction log
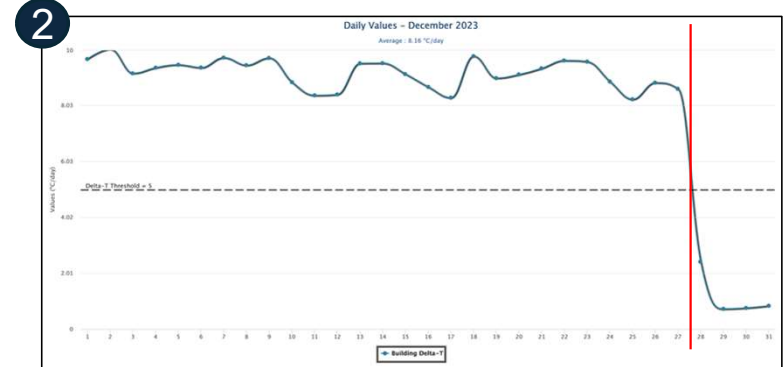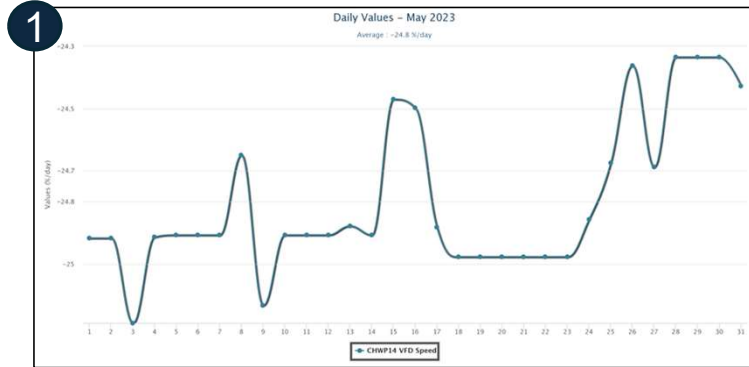

S.R	Asset	Data Points	*Unit*	Data Accuracy	Issue Detected on	Priority	Rectification Status	Comments
1	Pump	Speed	*%*	Data Visible but negative	01-Oct-22	Medium	Pending	Sensor is reading negative values
2	Building Delta-T	Building Delta-T	*C*	Data Visible but Inaccurate	01-Mar-24	High	Pending	Possible Sensor Malfunction after cooling tower failure
3	FAHUs 2 and 3	Relative Humidity	*%*	Data values are fluctuating	30-Apr-24	Medium	Pending	Possible Sensor Malfunction
4	FAHUs 1 and 2	Supply Air Fan Speed	*%*	Data Visible but Inaccurate	04-May-24	Medium	Pending	Possible Sensor Malfunction
5	FAHU 3	Return Air Fan Speed	*%*	Data Visible but Inaccurate	04-May-24	Medium	Pending	Possible Sensor Malfunction
6	secondary pump 1	energy consumption	*kWh*	Data Visible but Inaccurate	01-Oct-22	Medium	Pending	Sensor is reading faulty values
7	FAHU4	FAHU 4 return air DBT	*C*	Data Visible but Inaccurate	17-Feb-23	Medium	Actioned	Sensor is reading faulty values (negative)
8	MDB6	MDB6	*kWh*	Data Visible but Inaccurate	17-Feb-23	High	Actioned	MDB6 readings are not showing on the platform after fixing the meter
9	FAHU1	RA or SA CO2 level	*ppm*	Data Visible but Inaccurate	24-Mar-23	Medium	Actioned	RA CO2 levels are lower than Supply CO2 levels which means that there is a sensor problem in FAHU1

Our energy managers using the data analytics in the platform observed that CO2 levels are way lower than thresholds allowing for speed reduction in FAHUs w/o impacting standards of comfort

Daily Values – June 2024
Average : 459.07 ppm/day
CO2 Threshold = 800

FAHU3 Return Air CO2
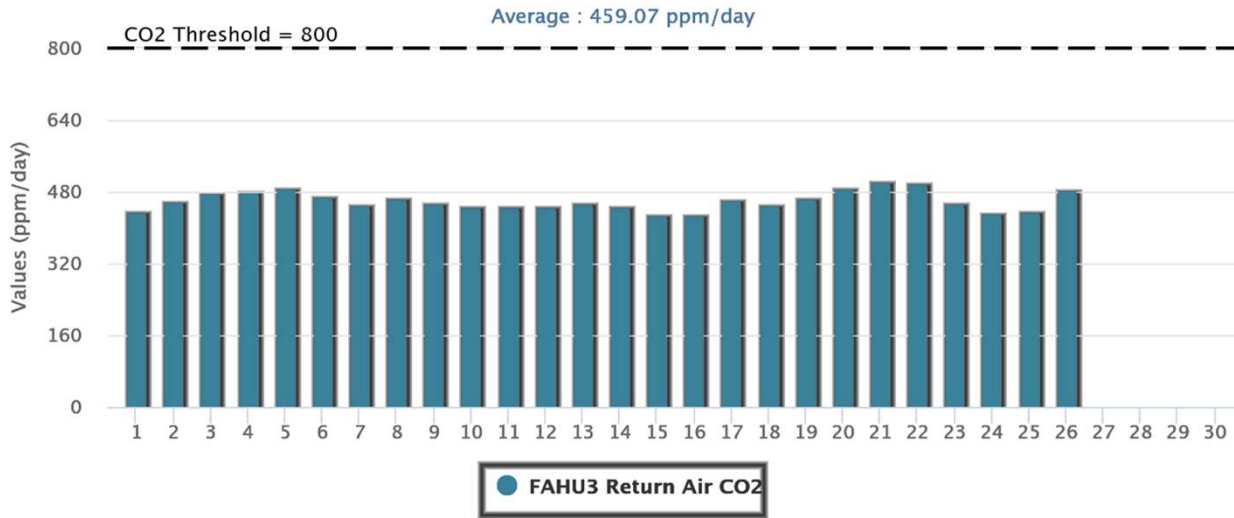
CO2 Analysis (figure 2)
The CO2 levels were tracked to be significantly below the recommended ASHRAE level (around 800 ppm), this makes room for reducing the speed of FAHUs

Simulation
Using the platform, we were able to simulate the impact of reducing the speed of FAHUs by 10% on energy savings

Recommendations
Accordingly, the client was advised to reduce the speeds of FAHUs by 10%

ECM	Description	simulated		realized (actual)		Client Status
		Savings %	Savings (kWh)	Savings %	Savings (kWh)	
SmartAnalytics Recommendations						
1	Reduce FAHU1 Speed by 5 Hz (~10%) along the day throughout the year	30%	15,460	34%	17,521	Agreed
2	Reduce FAHU2 Speed by 5 Hz (~10%) along the day throughout the year	30%	12,504	26%	10,836	Agreed
3	Reduce FAHU3 Speed by 5 Hz (~10%) along the day throughout the year	30%	7,190	28%	6,710	Agreed
4	Reduce FAHU4 Speed by 5 Hz (~10%) along the day throughout the year	30%	15,906	27%	14,315	Agreed

The proprietary methodology to connect, customize and Go-Live with the SmartAnalytics platform

1 week	4 weeks	3 weeks	2 weeks	2 weeks	Continuous
① Digitalization Assessment	② IT/OT Integration	③ Data Onboarding	④ UX/UI Design	⑤ GO LIVE	⑥ Success & Enablement

Task	Activities
① Digitalization Assessment	Prioritize energy equipment and KPIs to be monitored and assess site digital maturity to connect and stream data
② IT/OT Integration	Integrate hardware and software to ensure that data can be captured from the field sensors and meters to arkEMIS
③ Data Onboarding	Upload historical data sets to verify data quality, including ingestion of M&V-related data
④ User Interface and User Experience Design (UX/UI)	Create unique user interface/user experience (dashboards, reports etc.) Configure drift triggers and alerts to fit site conditions of connected equipment Develop user-specific data analytical modules (if needed, as a separate scope)
⑤ GO LIVE	Deploy all data analytics modules incl. M&V module, test alerts and notifications and activate automated reports Provide insights and Client support by Ark's certified Energy Managers and Data Analysts, including Measurement and Verification audit reviews and savings opportunities detection
⑥ Customer Success and Enablement	Provide insights and Client support by Ark's certified Energy Managers and Data Analysts, including interpretation on addressing drift alerts and alarms, identification of savings opportunities, and operating the platform Audit energy savings reports for executed ECMs

Drive results
with energy data

Extracting Value from Data

Deriving valuable data from your energy monitoring system.

How data-driven insights support compliance with sustainability regulations and building certifications.

Using energy data to:

benchmark and improve sustainability metrics.

Reduced Costs & achieve ROI.

EnergyCAP is the #1 trusted energy and sustainability ERP

10K+
Energy and sustainability users

$20B+
Worth of vendor bills tracked annually

$500M+
Verified annual energy savings

Client energy and sustainability data → **ENERGYCAP.** → Manage consumption, reduce carbon, and drive savings

Energy and sustainability ERP // The single source of truth

Get instant access to validated, actionable data you can trust to better manage resource consumption, reduce your carbon footprint, reach net-zero, and drive massive savings.

ENERGYCAP. CarbonHub

Financial-grade greenhouse gas accounting

Target and track emissions.

An advanced, holistic view of financial-grade emissions data across your business with automatically applied factors to meet your ESG reporting needs.

Customer Data Type:
GHG activities

Persona:
Sustainability

ENERGYCAP. UtilityManagement™

Portfolio-level energy and sustainability reporting

Manage and see it all.

Get accurate and reliable energy and utility data across your entire portfolio and streamline energy and accounting workflows.

Customer Data Type: Utilities/Bill/Resources

Persona:
Finance/energy

ENERGYCAP. SmartAnalytics™

Real-time energy and sustainability analytics

Dive deep. Respond quickly.

Dive deep into real-time performance of assets, devices, and sensors. Make quick, data-driven decisions for high-performance, net-zero buildings.

Customer Data Type:
Time-Series/Interval Energy

Persona:
Energy/facilities

CAPture Services: Bill CAPture, Bill Processing/Managed Services

EnergyCAP CarbonHub // Financial-grade greenhouse gas accounting
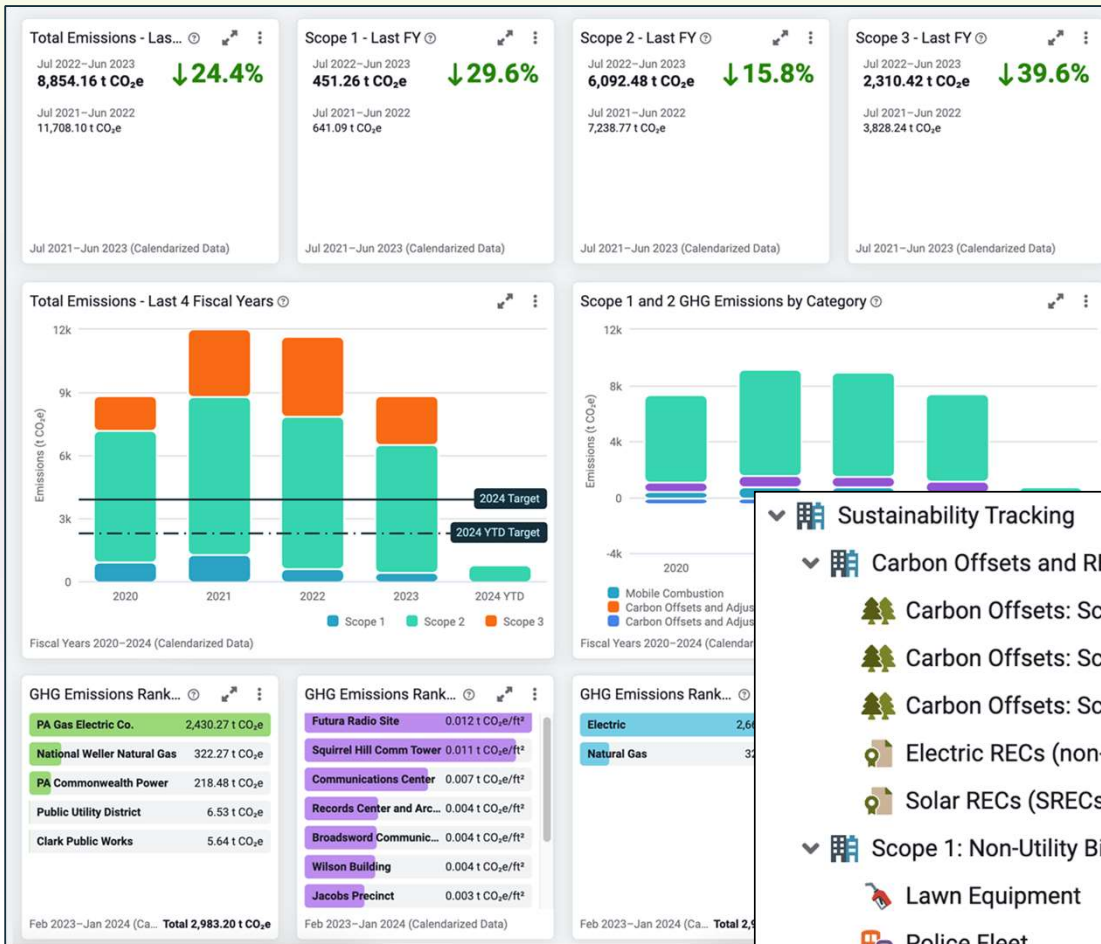
Double-dip on utility bill data you're already tracking

Track non-utility data side-by-side with energy information:

- Fleet data

- Employee commuting

- Business travel

- Capital purchases

- Offsets/Renewable Energy Credits

- Currency-based GHG conversions

- and more...

Set Custom and Standard Factors

Dedicated Sustainability Hierarchy for Easy Reporting/Analysis

Granular GHG reporting, comparison, and analysis // All scopes
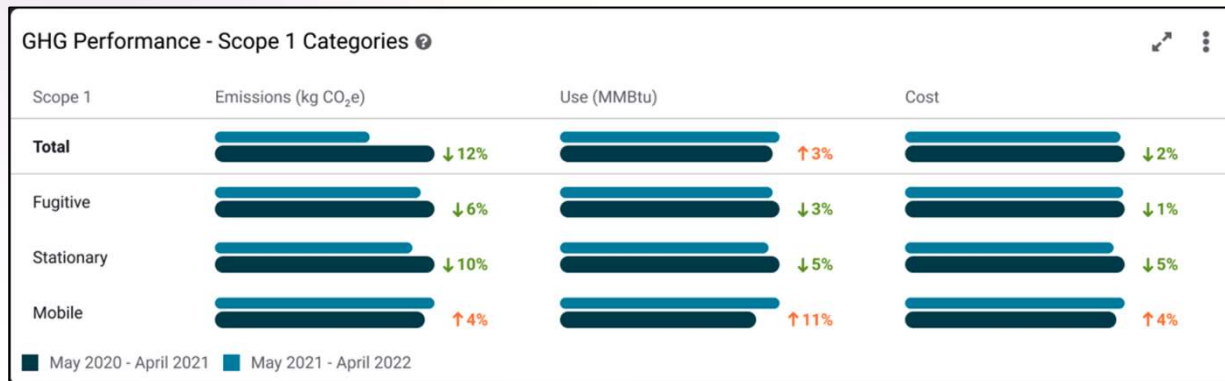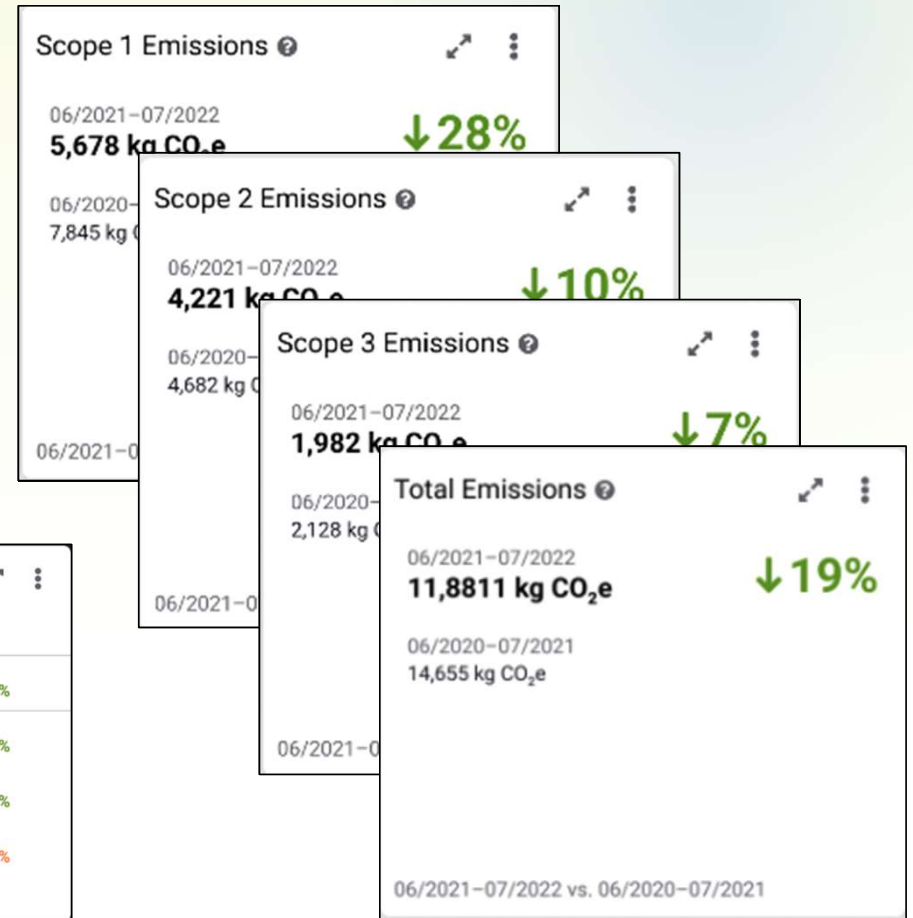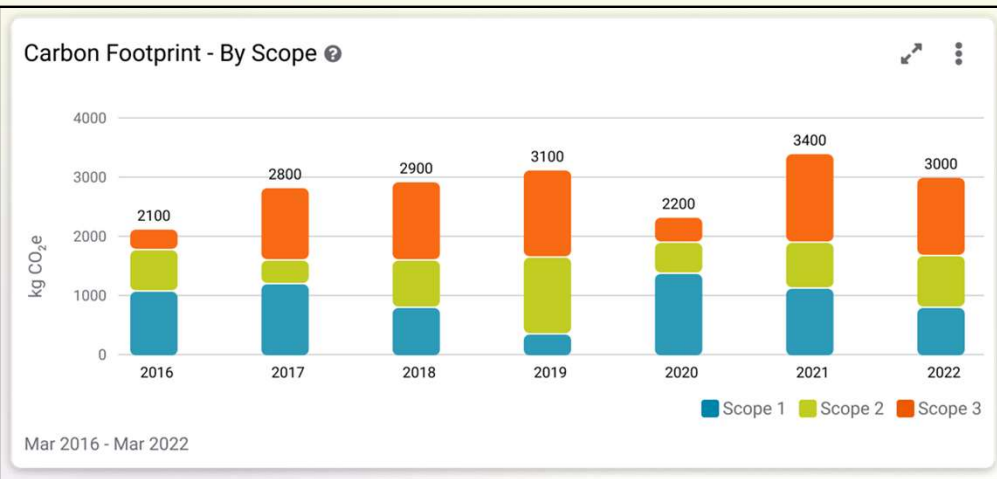
Customizable, Shareable CarbonHub Dashboards

Questions?