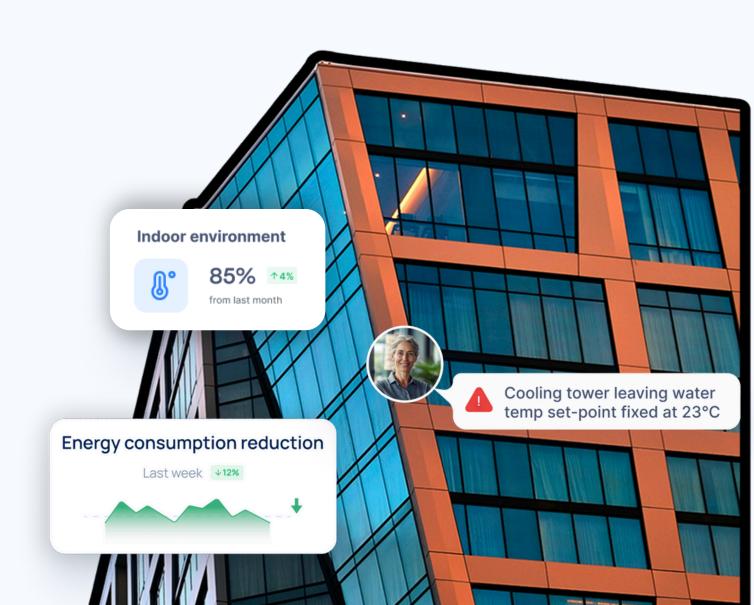


**CIM eBook** 

# Guide to Building Analytics

CIM's guide to leveraging building analytics to enhance building performance, reduce costs, and achieve sustainability goals.





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# Introduction

In today's rapidly evolving real estate landscape, property owners and managers face increasing pressure to improve building performance, reduce operational costs, reach sustainability targets and meet investor expectations. This has led to a surge in interest in building analytics—a transformative technology that leverages existing building data to provide actionable insights into how a building or portfolio is performing operationally.

# **Analytics by the numbers**

Building analytics is a rapidly expanding field, and the numbers tell a compelling story of its growth and impact:



# Market growth

The building analytics market was valued at USD <u>9.01 billion</u> in 2023 and is expected to reach USD 19.2 billion by 2030, a Compound Annual Growth Rate (CAGR) of 14.23%.



# **Global adoption**

In 2025, <u>Asia Pacific</u> accounts for the largest market share in the building analytics market, and this region is also estimated to grow at the highest CAGR over the forecast period (2025-2030).



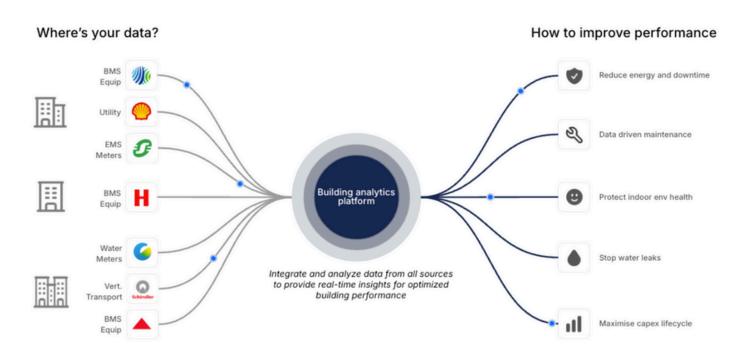
# **Energy savings potential**

Buildings equipped with analytics software generally reduce energy consumption by up to 30% through improved operational efficiency and automated fault detection.



# What is building analytics?

Building analytics refers to a software platform that collects, analyzes, and interprets thousands of data points from various systems within a building to improve its performance, efficiency, and operational reliability. At its core, building analytics software transforms raw time series data from building systems and equipment into actionable insights. These insights help property owners and managers improve building sustainability, reduce maintenance spend, improve supply chain productivity and keep tenants happy.



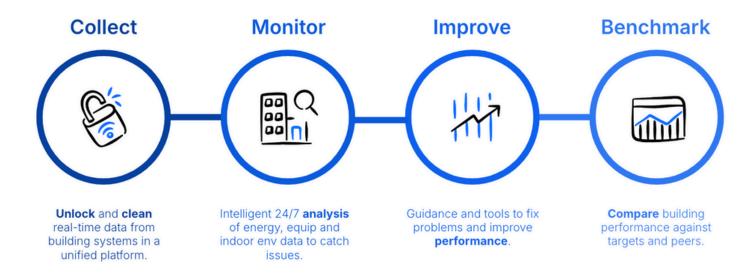
At the heart of analytics platforms is the ability to aggregate data from multiple sources

Building analytics platforms collect and normalize data from heating, ventilation, air conditioning (HVAC), elevators, lighting, security, and other building systems via the building automation system (BAS) or directly from IoT sensors and API data streams to create a centralized data set for a single building or entire portfolio. Al-powered analytics software processes the data, applying rules-based algorithms to constantly analyze the data to uncover patterns, faults, anomalies, and opportunities for improvement. Building analytics software enables stakeholders to:

- Monitor and benchmark key metrics across systems.
- Automate fault detection and prioritize critical maintenance tasks.
- Generate predictive insights for maintenance and energy optimization.
- Visualize energy consumption and operational performance in real-time.
- Understand the performance and productivity of their supply chain.

# Elements of building analytics software

Building analytics platforms generally have four core elements: collect, monitor, improve, and benchmark. Each function helps transform raw building data into actionable insights, improving operational efficiency, tenant experience, and strategic decision making. Below is a breakdown of these elements, highlighting how best-in-class platforms operate.

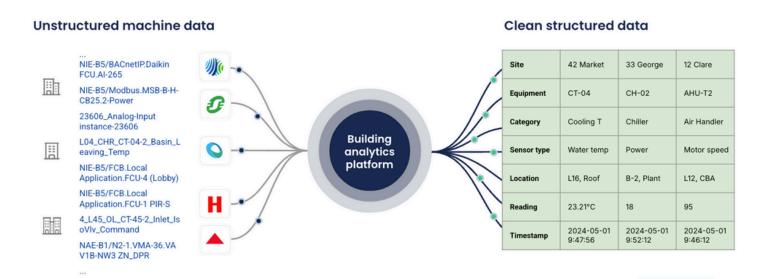


# 1. Collect: gathering of raw data

The foundation of all good building analytics platforms lies in their ability to collect, clean, and organize data from disparate sources. Common features in this component include:



- **Data collection and storage**: For leading platforms, data is gathered at least every 15 minutes from multiple sources, including utility meters, submeters, HVAC systems, indoor environment sensors, weather data, vertical transport, bathroom fixtures and other critical equipment. The data is initially saved locally in an edge device and then transferred to secure cloud storage for analysis.
- **Data aggregation**: Building data is often fragmented across different systems, formats and frequencies, creating blind spots and inefficiencies in building management. Analytics platforms unify siloed data from disparate sources, such as building automation systems, utility providers and 3rd party API's into a single dataset for complete visibility and clarity.
- **Data normalisation**: Platforms standardize unstructured data by leveraging machine learning and artificial intelligence to quickly identify, classify, and label the thousands of raw data points being collected. Thanks to AI, leading building analytics platforms can now 'onboard' buildings in days compared to weeks when all the data points had to be manually identified.



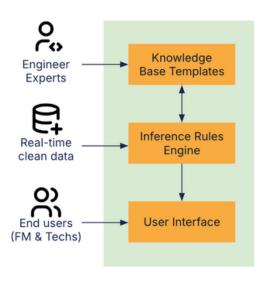
The process of normalizing unstructured data



# 2. Monitor: identifying issues in real-time

Building analytics platforms house a library of algorithm-based rules, often powered by an Al 'expert system' (see glossary). This is the basis for most platform's automated fault detection and diagnostics (AFDD) capability, continuously monitoring building systems in real-time to detect faults, anomalies or inefficiencies. Common features in this component include:

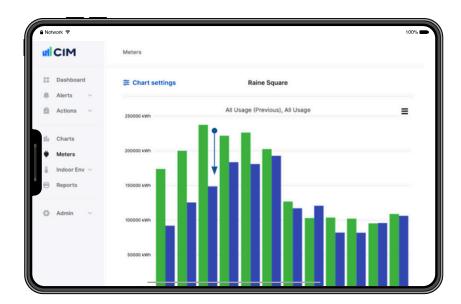
- Utility monitoring: Platforms track energy, gas, and water usage via realtime meter and submeter data. This enables granular consumption analysis, trend identification, and early detection of anomalies like leaks or excessive usage.
- **Equipment monitoring:** Continuous monitoring of operational data points across critical plant and equipment allows for the early identification of critical faults or anomalies, including overnight operation or mechanical failures. This helps optimize resource allocation, reduce downtime, and extend equipment lifecycles.
- **Indoor environment monitoring:** Platforms track critical metrics such as temperature, relative humidity, and air quality against set parameters. This ensures compliance with standards (e.g., WELL and NABERS IE), optimizes tenant comfort, and identifies performance issues at a granular level.





Al expert system automates issue diagnosis before incidents occur





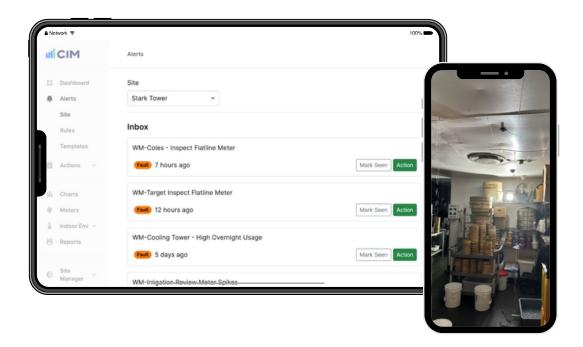
Platforms can measure and verify utility performance improvements with live meter data

# 3. Improve: driving efficiency through fast issue resolution

Building analytics platforms empower operations teams to keep portfolios running at maximum levels of efficiency by helping fix issues fast before tenants and customers are impacted. Offering a centralized workflow, teams spend far less time doing meetings, emails, and follow-ups, with more time dedicated to resolving issues that matter. Common features in this component include:

- Automated alerts: Platforms generate detailed alerts for critical issues, including affected equipment, recommended solutions, and trend data. This ensures problems are addressed promptly before impacting tenants or operations.
- **Digital workflows:** A centralized digital workflow tool enables seamless task management, allowing teams to raise, track, and resolve issues collaboratively. Notifications delivered to preferred communication channels (e.g., Microsoft Teams or Slack) to ensure immediate action.
- Recommend solutions: Leading building analytics platforms not only immediately identify and alert team to issues they provide detailed stepby-step solutions to rectify the problem. By providing solutions, building analytics platforms lower the level of technical knowledge for operation teams to keep buildings running at peak performance.





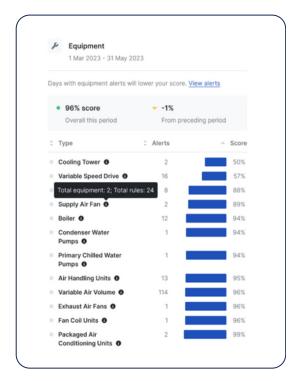
Automated FDD alerts and custom alert notifications give teams the information and tools needed to take action, many with functionality to attach related images or files.

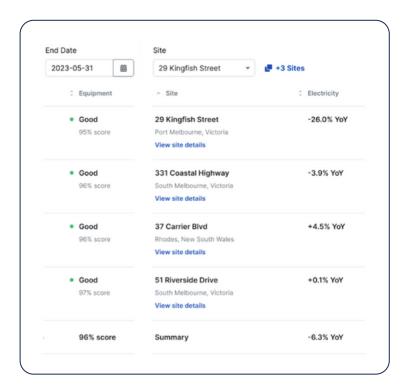
# 4. Benchmark: advanced building intelligence

Building analytics software provides Executive and Asset Management teams with advanced intelligence and transparency to make smarter data-driven decisions across portfolios. Benchmarking tools enable teams to evaluate performance between buildings, and against peers and industry standards. Common features in this component include:

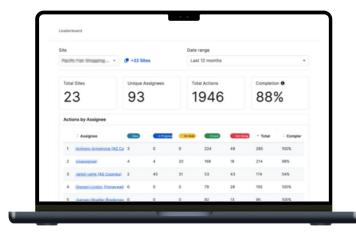
- Portfolio performance: Platforms provide a comparative analysis of metrics like energy consumption, equipment uptime, and indoor environment quality. Rankings (e.g., "Excellent" to "Poor") offer actionable insights to prioritize improvements.
- Indoor environment: Platforms typically enable comparison of comfort conditions across buildings to identify areas requiring attention. These insights improve tenant retention and provide a competitive edge in attracting new tenants.
- **Equipment performance**: Analysis of uptime and efficiency across systems to inform capital expenditure planning and extend lifecycle where possible.
- Team and contractor benchmarking: Measurement of team and contractor performance on engagement, activity and closure rates, enabling accountability and recognition of high performers.

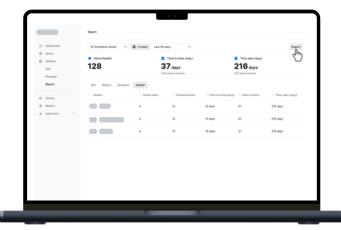






Benchmarking of equipment performance across a portfolio of properties





Leaderboards offering visibility over team and contractor performance and activity

# How does analytics complement a BAS?

A Building Automation System (BAS) is essential for controlling and monitoring a building's systems, but it has limitations in diagnosing inefficiencies and uncovering optimization opportunities. This is where building analytics comes in. Layered on top of the BAS, they provide real-time insights, proactive issue detection, and streamlined workflows that enhance operational efficiency. Below are the key ways building analytics platforms work alongside a BAS to drive better outcomes for building performance and portfolio management.

# 1. Confirm the BAS is operating the way it should be

The first and foundational task is to confirm the BAS is operating correctly and efficiently. A BAS is not designed to selfcorrectively 'check its own homework', so may be controlling and operating erroneously. Analytics also shine as an independent third party, able to provide an unbiased view of the BAS to ensure the most benefit is generated before upgrading.

# 2. Find what the BAS can't and pinpoint issues before they escalate

The primary function of the BAS is to control and monitor the systems and setpoints within a building. Analytics goes one step further by identifying anomalies, dips in system performance and optimization opportunities. While the BAS identifies issues once they've already occurred, analytics software raises performance concerns before they spiral into critical breaches.

# 3. Supercharge workflow for enhanced productivity

Analytics platforms supplement data from the BAS by providing actionable steps for issue diagnosis, and a centralized workflow for teams to execute them. Both technical and non-technical stakeholders can seamlessly collaborate in real-time to quickly and efficiently resolve issues, prioritized based on impact assessment. Human capital is far better utilised across the whole supply chain as users are directed to real issues, rather than wasting time checking items that are fully functional.

4. Aggregate multiple BAS's for ease of portfolio visibility

At the multi-asset level, analytics software offers a holistic view of operational performance with all critical data centralised in the one place. The best platforms are BAS-agnostic, consolidating data from different BAS's across multiple sites. This portfolio lens enables owners and managers to monitor, trend and benchmark everything from supply chain performance to thermal comfort, energy consumption, emissions avoided and more.

# **Benefits and value offered**

Building analytics is revolutionizing how real estate is managed. From optimizing utility consumption to enhancing tenant comfort and extending equipment lifecycles, analytics empower stakeholders to make smarter, data-driven decisions. These platforms not only improve operational efficiency but also support long-term goals like sustainability, portfolio optimization, and strategic capex planning.

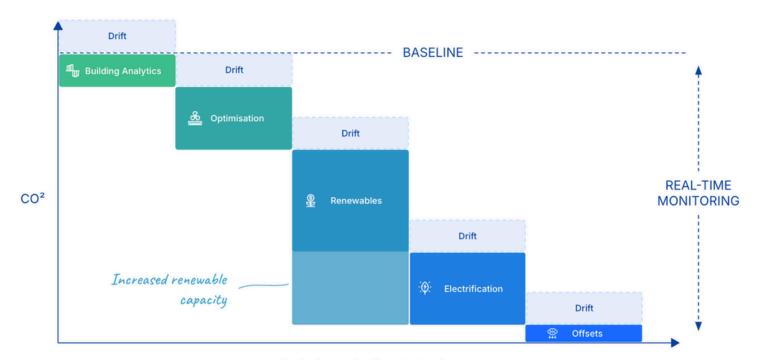
# **Utility efficiency**

Building analytics empowers precise utility optimization by leveraging real-time monitoring and advanced fault detection and diagnostics (AFDD). These systems analyze electricity, gas, and water consumption patterns to uncover inefficiencies, unnecessary operations, and peak load behaviors. By identifying and addressing equipment issues in real-time, analytics enable prompt fixes to HVAC, lighting, and water systems, significantly reducing resource usage.

By optimizing consumption and reducing emissions, these improvements also support higher sustainability ratings, such as LEED, NABERS, and BREEAM, ensuring compliance with certification benchmarks and demonstrating



measurable progress toward reducing environmental impact. In fact, for many forward-thinking portfolio owners, analytics forms the foundation of their overarching sustainability or Net Zero roadmaps, as illustrated below.



Emission reduction strategies



Analytics in action

During PEAK's deployment across a leading Australian portfolio of over 60 office assets, 71% of buildings improved their sustainability ratings by at least 0.5 stars, contributing to an average portfolio rating of 5.2—surpassing the national industry average of 4.9. The portfolio achieved 17.4 million KWh of energy savings compared to a pre-COVID 2019 baseline, showcasing analytics as a critical driver of sustainability success.

# Vendor benchmarking

Analytics platforms enable owners to assess and compare vendor performance based on objective data. These platforms track closure rates, alert response times and engagement metrics to offer a comprehensive view of how vendors perform over time. With real-time insights and historical trends, businesses can identify top-performing vendors, pinpoint underperformers, and drive accountability by setting clear performance expectations. This data-driven



approach enhances contract negotiations, optimizes vendor selection, and ensures service providers consistently meet operational and financial goals.

# Improved indoor environment

Building analytics platforms constantly monitor key comfort metrics like temperature and relative humidity from zoned temperature sensors. Robust monitoring ensures optimal thermal comfort can be maintained by identifying and diagnosing deviations from the optimal range, while AFDD rules flag potential equipment failure. The result is an optimum indoor environment, conducive to satisfied, healthy and productive building occupants.



Analytics in action

At <u>Burlington's Dublin Landings</u>, CIM's real-time monitoring has enabled a near-perfect <u>thermal comfort</u> score. After deploying PEAK, occupant comfort levels increased from an already impressive 91% to 97%. Dublin Landings achieved this level of comfort with over 200 sensors that feed a steady stream of data from their BAS to the PEAK Platform for constant monitoring. The site's FM and appointed contractors quickly check current thermal comfort via the platform's IE tab, leaving no lag time between sub-optimal performance and prompt resolution.

# **Portfolio visibility**

Building analytics provides a unified view across an entire portfolio, consolidating real-time data on utility consumption, equipment performance, contractor and team activity. Centralized dashboards enable teams to compare sites, identify inefficiencies, and track sustainability and cost-saving goals. Aldriven insights help prioritize maintenance and detect system-wide issues, ensuring smarter, data-driven decisions and optimized performance across even large complex portfolios. This is important as portfolios almost certainly span buildings with different BAS vendors.

# **Extended equipment lifecycle**

Building analytics extends the lifespan of critical plant and equipment by enabling proactive, data-driven maintenance. Real-time monitoring allows for



timely, preemptive action to prevent costly breakdowns. This strategic approach reduces unplanned downtime, minimizes wear and tear, and ensures equipment operates at peak performance for longer than initially estimated life expectancy.



Analytics in action

At a major shopping centre, a detailed analysis of aging chillers using the PEAK Platform identified that only one required immediate replacement, contrary to initial assumptions. By optimizing control strategies, the system achieved a 13.5% reduction in chilled water consumption while maintaining occupant comfort. The remaining chillers' lifecycles were extended by five years, deferring upgrades and ensuring smarter capital expenditure planning.

# **Reduced maintenance costs**

Building analytics software helps reduce maintenance costs by enabling owners to move from preventative based contracts to proactive data-driven maintenance. By continuously monitoring equipment performance with a building analytics platform, preventative maintenance activities can be undertaken less frequently or removed entirely. As a result, maintenance providers can service an increased number of assets with fewer technicians. The quality and type of work will also shift, freeing up some of the more scheduled tasks and routine checks, so that the technician can focus on resolving issues or carrying out repairs, leading to a higher performing building in terms of comfort and energy efficiency.

# Collaboration and workflow

A centralized workflow ensures all team members can collaborate in real-time, accessing shared insights to quickly and efficiently address issues. Automated alerts and intuitive dashboards streamline task delegation, aligning teams and ensuring timely action. With everyone working from a single, data-driven platform, operational efficiency improves and issues are resolved faster.





# Analytics in action

In a recent story on the impact of PEAK on an HVAC technician's workflow, we gathered information from technician David about how PEAK supports his daily tasks. Within a single platform, technicians like David can capture photos, comments and information pertaining to an issue, creating a complete digital history of their work and informing future decision-making.

Before PEAK, David needed input from multiple stakeholders before issues could be fully resolved. This level of input required a stream of emails, calls, and text messages to manage. Not only did this slow progress; it also blurred the lines of accountability and facilitated fingerpointing. By capturing and communicating task data within PEAK, the whole team has real-time visibility over where issues stand, who is currently doing what, and what must be done prior to issue resolution.

# **Facilities Manager upskilling**

Building analytics empowers Facilities Managers to make quicker and better decisions by directing them to priority issues and providing them with the recommended rectification actions. This enables more junior and less technical facilities managers to quickly upskill in technical areas that would have previously taken years of training. Having access to the data allows teams to better understand their own buildings and the complex network of services within them. The best platforms are designed to be highly user-friendly, enabling both technical and non-technical users to extract actionable insights and collaborate effectively.

# Considerations when selecting a platform

Choosing the right building analytics platform requires careful evaluation of its features, technical capabilities, and alignment with your business goals.

# 1. Software capabilities

- **Depth of analytics:** Platforms must identify faults, diagnose root causes, and provide actionable resolutions. Advanced fault detection should include equipment hierarchies and time schedules.
- Visualization of analytics: Dashboards should support live and historical data visualization, offering trend overlays for faults and recoveries. Intuitive interfaces should cater to both technical and non-technical stakeholders.
- Range of analytics: Ensure the platform offers diverse functionalities like energy, water, indoor air quality (IAQ), and contractor performance monitoring.
- **Data source types:** The platform must ingest various data sources, such as lighting, HVAC, water, foot traffic, and vertical transport systems, to provide a holistic view.
- **Report generation:** Platforms should allow users to generate detailed reports quickly, enabling on-demand insights. Customizable reports are crucial for stakeholder presentations.
- Dashboarding: Dashboards should display real-time performance metrics with drill-down capabilities, enabling users to explore issues at granular levels.
- **False alarm mitigation:** Use AI to suppress false positives/negatives based on context, reducing noise and ensuring actionable alerts.
- Artificial intelligence and machine learning: Advanced platforms leverage AI/ML for predictive maintenance, alert prioritization, and anomaly detection.



# 2. Commercials

- **Corporate ownership:** Verify ownership structure to avoid conflicts of interest, especially with mechanical or BAS contractors.
- **IP ownership:** Understand which parts of the platform are owned versus licensed and the implications for customization and support.
- **Team:** Assess the expertise of the provider's engineering, analytics, and account management teams.
- Market validation: Ensure the platform is validated by third-party reviews and references. Look for independent case studies.
- Client base: Request details about the platform's current clients, including industry segments and portfolio-scale deployments.
- **Industry-specific case studies:** Review case studies relevant to your industry to gauge the platform's suitability for your needs.
- Service levels: Clarify service agreements, including support availability and response times.

# 3. Pricing

- Quoting methodology: Understand how pricing is determined, including setup and recurring costs.
- Investigation costs: Check for fees associated with feasibility assessments or initial evaluations.
- CAPEX costs: Evaluate any upfront capital expenditure required for hardware or integration.
- Ongoing fees: Assess recurring costs for software access, updates, and support.
- Contract lengths: Determine available contract durations and flexibility for renewals or extensions.
- Contract end fees: Understand decommissioning or early termination fees.

# 4. Onboarding

- **Speed-to-value:** Assess how quickly the platform can be operational and deliver actionable insights.
- **OPEX and CAPEX requirements:** Clarify operational and capital expenses during onboarding.



# 5. Customer support

- Onsite team, BAS, mech, and analytics collaboration: Providers should facilitate collaboration between analytics experts and your onsite team to optimize performance.
- **Optimization strategies:** Look for platforms that offer actionable insights beyond fault detection, such as energy-saving recommendations.

# 6. Network and data

- Network interaction: Ensure the platform does not disrupt existing network operations and can operate offline if necessary.
- **Data sovereignty:** Verify where your data is stored and ensure compliance with local data regulations.
- **Data storage:** Confirm storage redundancy, accessibility, and retrieval policies.
- Data security: Assess security protocols, including encryption and user access controls.
- Penetration testing: Ensure the platform undergoes regular third-party security audits.

# **CIM's PEAK Platform**

CIM's PEAK Platform is an Al-powered building analytics platform that enhances the financial and environmental performance of commercial portfolios, providing owners with unparalleled visibility into property operations. By minimizing utility consumption and maintenance costs, as well as boosting team and vendor productivity, it significantly improves net operating income, asset value, and tenant satisfaction.

# Proven benefits to unlock a buildings' potential

Real-time portfolio visibility

Contractor accountability

Rapid rectification of issues

Critical equipment confidence

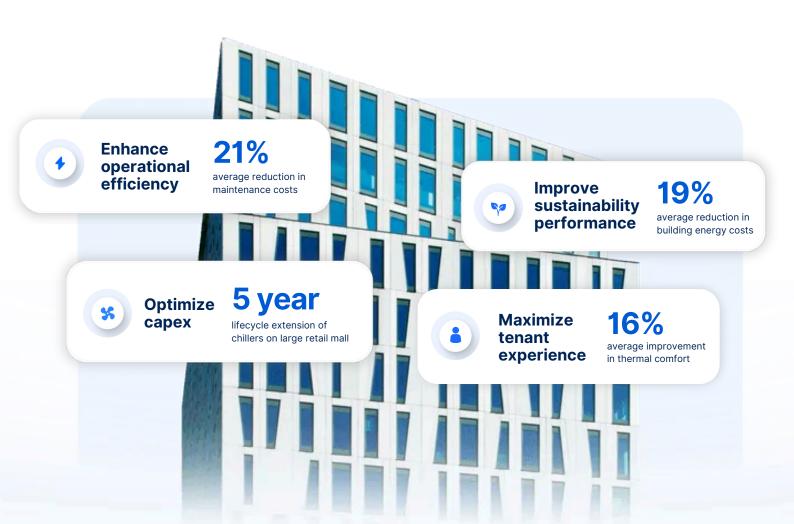
Improved tenant comfort

Improved workflow

Elimination of utility wastage

Extended equipment lifetime

Reduced maintenance spend





# What's included in CIM's offering?

#### **PEAK Platform**

#### **Features**

- Utility monitoring
- Equipment monitoring
- IEQ monitoring
- AFDD rules engine
- Alert notifications
- Digital workflow
- Sustainability ratings
- Dashboards and reports

#### **Services**

- Dedicated Analytics Engineer
- Data onboarding & commissioning
- AFDD Rules deployment & tuning
- Custom alert notification set-up
- Site team & contractor training
- Data-driven maintenance adoption
- Objective-setting and ongoing site alignment
- Quarterly sponsor meeting

### **Building Optimization**

- Dedicated Building Performance Engineer
- Energy efficiency audit
- Quantified saving opportunities
- Bespoke HVAC controls strategy
- Optimisation workshops
- Seasonal tuning
- Measurement and verification reporting

# Proven track record with world-leading companies

"This software improves asset value on a number of levels. First, it enhances building efficiency and delivers electricity savings, resulting in significant cost benefits and improved NOI. It also aligns with our focus on achieving Net Zero carbon emissions without compromising tenant comfort."



Simon Howard



"We asked CIM to get involved so they could give us the oversight we needed across all sites and assist our team to continually achieve the highest levels of performance, collaboration and site optimisation possible. The partnership has enabled us to achieve best practice across our portfolio faster than anticipated."



Scott Crellin
National Operations Director

















# Glossary of key analytics terms

Building analytics involves a range of technical terms and concepts that can sometimes feel overwhelming. To help, we've compiled a glossary of essential terminology, drawing both from the terms used in this guide and from our experience in the field.

# **Al-powered Rules Engine**

An Al-powered rules engine leverages a comprehensive library of rules-based algorithms to analyze building data and detect inefficiencies, faults, or anomalies across equipment and operations. These algorithms continuously monitor systems, identifying issues in real-time and diagnosing root causes with precision.

# **Building Automation System (BAS)**

A centralised control system that monitors and manages a building's mechanical, electrical, and plumbing systems, including HVAC, lighting, and elevators.

# **Energy Management System (EMS)**

A system designed to monitor, control, and optimize energy consumption within a building or a group of buildings.

# **CAPEX (Capital Expenditure)**

Funds used to acquire, upgrade, or maintain physical assets like building systems or equipment. Analytics platforms help prioritize CAPEX by identifying areas requiring investment.

# **OPEX (Operational Expenditure)**

The day-to-day costs of running a building, such as utilities, maintenance, and staffing. Analytics platforms aim to reduce OPEX by improving efficiency and preventing costly breakdowns.

# **Condition-based Maintenance (CBM)**

A proactive maintenance strategy driven by real-time data from equipment. CBM schedules repairs based on the actual condition of systems rather than



predetermined timelines.

### **Data normalisation**

The process of cleaning and standardising unstructured data from different sources to make it consistent and comparable across systems.

# **Fault Detection and Diagnostics (FDD)**

An advanced analytics capability to identify and analyze issues across various building systems. FDD employs sensors, data analytics, and predefined algorithms to detect anomalies, inefficiencies, or malfunctions. Once a fault is detected, the diagnostic component pinpoints the root cause, providing actionable insights to address the issue.

# **Indoor Environmental Quality (IEQ)**

Metrics such as temperature, humidity, and air quality that impact occupant comfort and well-being. Analytics platforms monitor and optimize IEQ for compliance and tenant satisfaction.

# **IoT (Internet of Things)**

A network of connected devices, such as sensors and meters, that collect and transmit real-time data about building systems and conditions.

# **Machine Learning (ML)**

A subset of artificial intelligence where algorithms analyze historical data to predict future outcomes. For example, ML models can forecast equipment failures or classify raw data into meaningful categories.

#### Metadata

Data that provides information about other data, such as labels or tags identifying equipment type and function. Accurate metadata is critical for efficient data organisation and analysis.

#### **Predictive maintenance**

A maintenance strategy that anticipates equipment failures before they occur by analysing data trends. Predictive maintenance reduces downtime and extends asset lifecycles.



# **Real-time monitoring**

Continuous data collection and analysis that provides immediate insights into building performance. Real-time monitoring helps detect anomalies and optimize operations proactively.

# **Submetering**

The practice of installing additional meters to measure specific energy, water, or gas usage within a building. Submetering enables detailed consumption tracking and tenant billing.

# **Utility monitoring**

Tracking and analysing data on energy, water, and gas usage to identify inefficiencies and reduce consumption.

#### **Workflow automation**

The use of software to streamline and automate routine processes, such as generating alerts or assigning maintenance tasks. Workflow automation improves team efficiency and reduces response times.

#### **Predictive maintenance**

A proactive maintenance strategy that uses data analysis and machine learning algorithms to predict when equipment failures might occur, allowing for timely interventions.

# **Occupancy sensors**

Devices that detect the presence of people in a space, allowing building systems to adjust lighting, HVAC, and other services based on actual usage.

# Setpoint

The desired target value for a controlled variable in a building system, such as the temperature setting for a thermostat.

# **Demand response**

A strategy that encourages consumers to reduce or shift their energy usage during peak periods in response to time-based rates or other incentives.



# **Carbon footprint**

The total amount of greenhouse gases emitted directly or indirectly by a building, expressed as a carbon dioxide equivalent.

# **Retro-commissioning**

The process of assessing and optimizing the performance of existing building systems to ensure they operate efficiently and meet current operational needs.

# **Expert system**

In AI, an expert system is a rule-based program that applies domain knowledge and logical inference to solve complex problems.



Talk to the experts at CIM to see how building analytics can unlock the potential of your portfolio.







