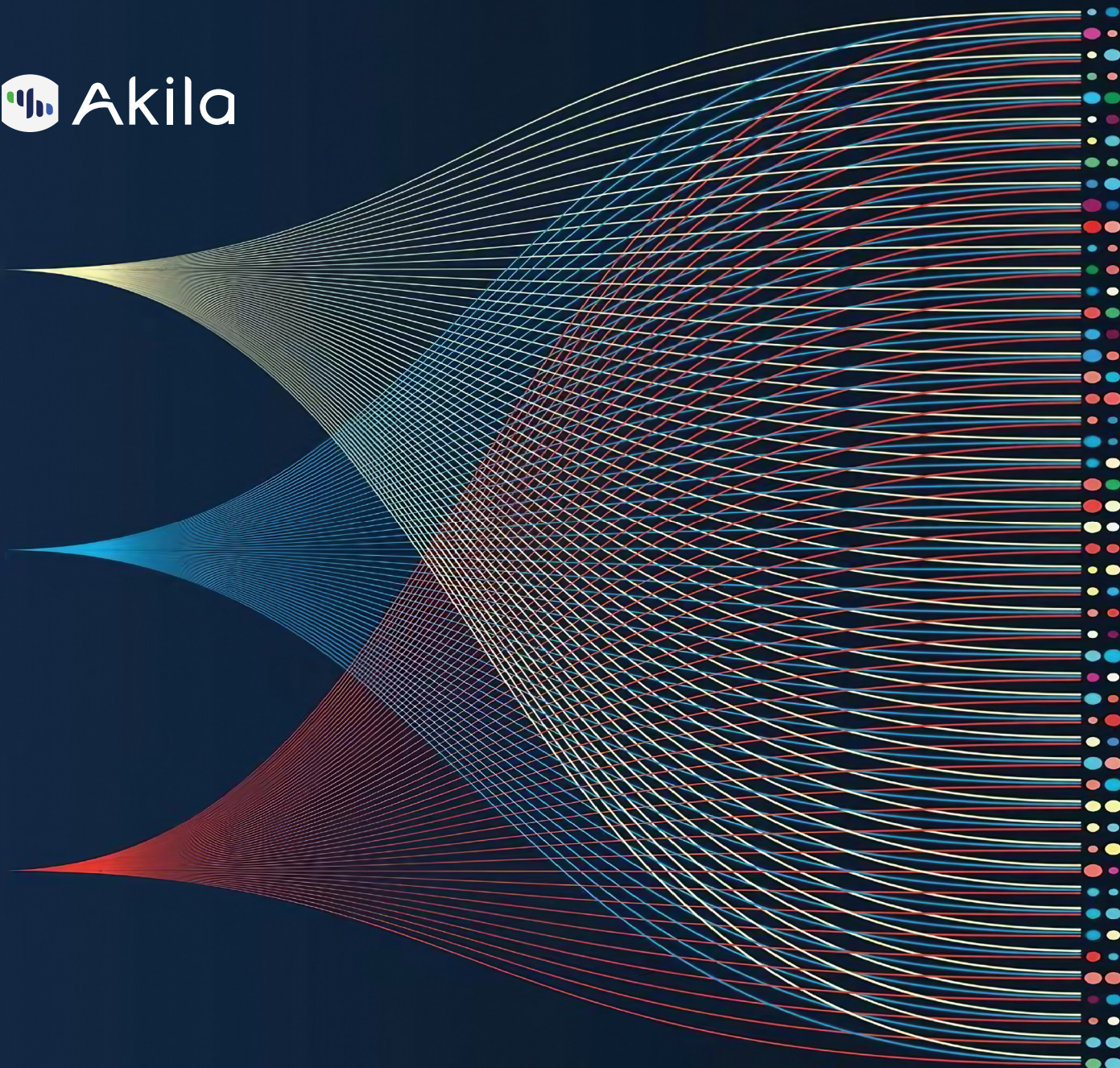


An abstract graphic on the right side of the page features a dense field of thin, curved lines in blue, red, and yellow. These lines originate from a point on the left and fan out towards the right, where they terminate in a vertical column of small, multi-colored dots. The overall effect is one of dynamic movement and data flow.

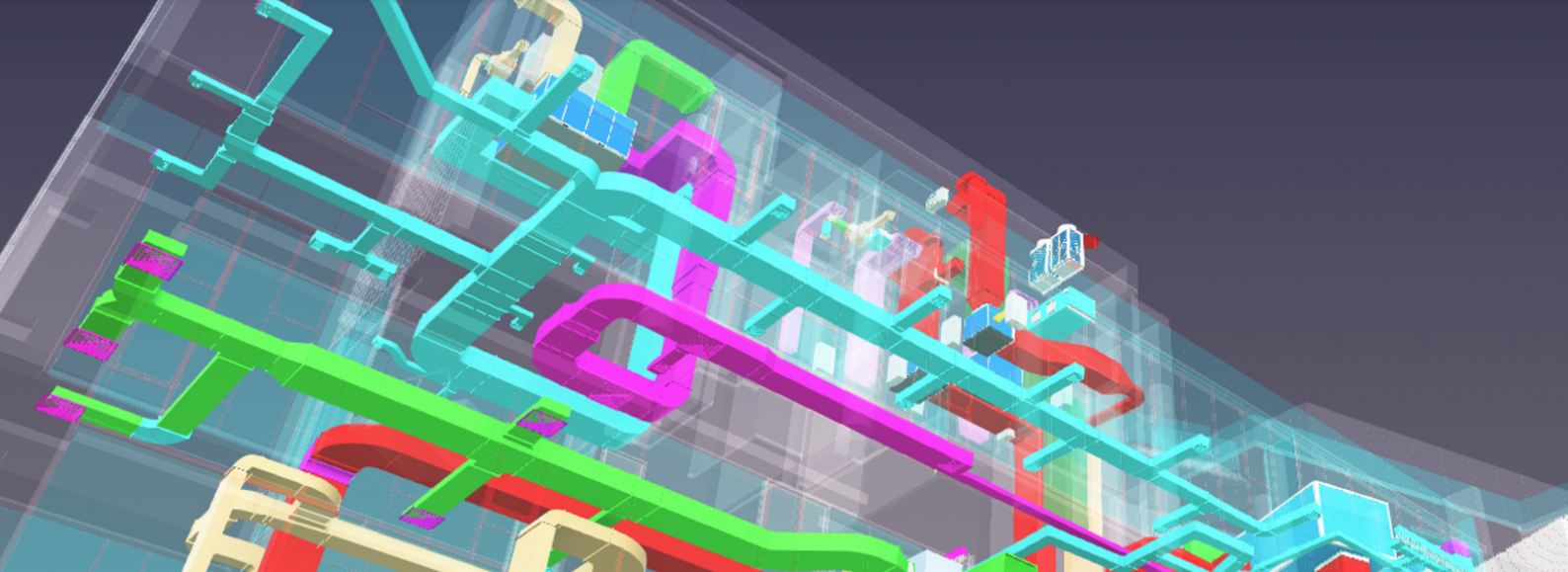
Future-Ready Hotel Portfolios: The Digital Twin & AI Opportunity

Empowering the sector to navigate rising costs,
energy complexity, and evolving regulations

WHITE PAPER

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Executive Summary

Resilience under pressure: Future-Proofing Hotel Portfolios with Digital Twins and AI

Hotels are operating under increasing pressure from rising utility costs, labor constraints, and tightening environmental regulations. According to the AHLA 2026 State of the Industry Report, utility expenses have increased more than 27% since 2019, while regulatory complexity continues to grow.

One example of this trend is New York City, where Local Law 97 (LL97) introduces a direct financial risk for non-compliant hotels, with penalties of \$268 per metric ton of CO₂ above permitted thresholds. For energy-intensive hospitality assets, this represents a recurring and material exposure which will be felt across the portfolio.

Akila's Digital Twin platform enables hotels to move from reactive energy management and static compliance reporting to continuous optimization and active emissions control. By integrating real-time operational data with advanced analytics, Akila delivers verified energy savings, regulatory compliance, and improved operational resilience.

In a New York City luxury hotel, Akila delivered rapid, measurable results within four months. Deployment of Akila establishes a foundation for continued year-round optimization detailed in this paper.

For hospitality leaders, digital twins are no longer experimental technology. They are rapidly becoming a core operating layer, transforming compliance obligations into financial and competitive advantage.

Summary of results: NYC hotel, 6 months

- **214,800 kWh** electricity savings
- **\$51,553** energy cost reduction
- **\$66,000** ConEdison RTEM incentive for real-time energy monitoring (maximum amount)

Industry context

Hospitality Under Structural Pressure

State of play 2026

Operating costs have grown ~4x faster than revenue (past 5 years).

Compliance is becoming mandatory, not optional.

Owners want ROI-positive optimization, not heavy renovation programs.

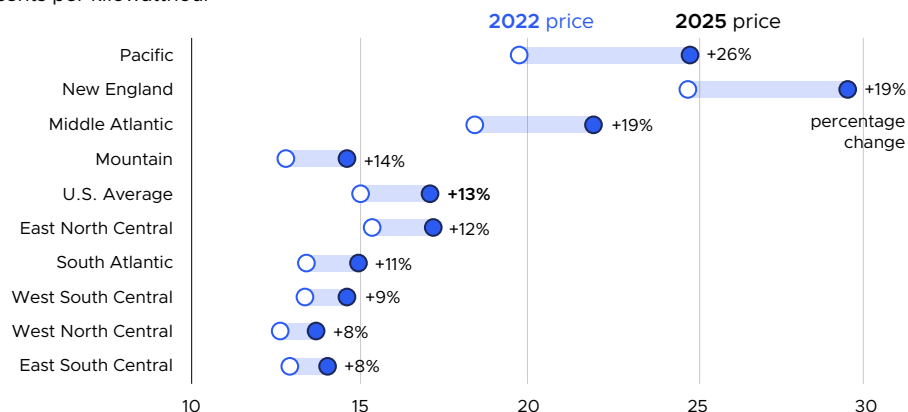
As hotels deal with inflation across a range of metrics, energy is the one cost category hotels can actually control.

The U.S. hospitality industry is entering 2026 under sustained operational pressure. According to the American Hotel & Lodging Association's 2026 State of the Industry Report, operating costs continue to rise faster than revenue, leaving profitability below pre-pandemic levels in many markets. Inflation, labor mandates, insurance, utilities, and regulatory compliance are no longer cyclical challenges but structural realities that hotel operators must actively manage.

Utility expenses in particular have become a growing concern. The AHLA report highlights that utility costs have increased by more than 27% since 2019, outpacing revenue growth and directly compressing margins. At the same time, cities and states are introducing building performance standards and energy mandates that increase both compliance risk and operational complexity for hotels.

Against this backdrop, hotel owners and operators are being forced to rethink traditional operating models. Incremental efficiency gains are no longer sufficient. What is required is continuous, data-driven optimization that reduces costs while preserving guest comfort and service quality.

Regional retail residential electricity prices (2022 and 2025)
cents per kilowatthour



Data source: U.S. Energy Information Administration, *Short-Term Energy Outlook*, May 2025
Data values: U.S. Regional Electricity Prices to Ultimate Customers



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Real-time digital twins enable structural cost reductions by continuously optimizing HVAC, energy and operations to protect GOP and EBITDA

— Maud Demurge, Head of Akila North America

Technology context

Why Digital Twins Are Gaining Traction in Hospitality

The AHLA report underscores a broader industry shift toward predictive, technology-enabled operations. With labor costs representing more than 30% of total hotel revenue and staffing shortages persisting across nearly half of AHLA member properties, productivity and automation have become strategic imperatives.

Digital twin platforms respond directly to these challenges by creating a real-time operational model of the hotel. Rather than relying on static dashboards or siloed building systems, digital twins integrate energy, HVAC, occupancy, and operational data into a single intelligence layer. This enables hotels to anticipate performance issues, simulate optimization scenarios, and continuously improve efficiency without disruptive capital projects.

Importantly, this approach aligns with evolving guest expectations. AHLA survey data shows that nearly two-thirds of travelers consider sustainability an important factor when choosing accommodations, and many are willing to pay a premium for hotels that demonstrate credible sustainability practices. Digital twins allow hotels to translate sustainability commitments into measurable, verifiable outcomes.

About Akila Digital Twin & AI platform

Akila is a digital twin and AI platform for the commercial real estate buildings and portfolios that has been deployed over 160 million sq ft of property to date.



- Integrates HVAC, energy, occupancy, BMS and more data into a single operational layer
- Enables continuous energy and emissions optimization without retrofit projects
- Supports regulatory compliance and performance-based incentive programs
- Deployed across commercial real estate, logistics, manufacturing, and hospitality portfolios worldwide



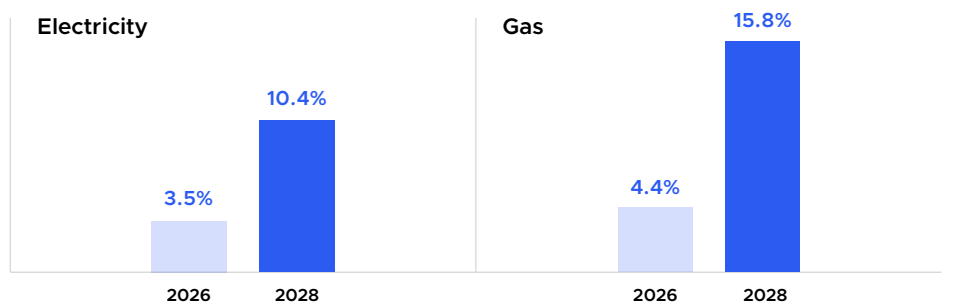
Profile

New York: A leading pressure market

America's most visited city typifies the wider challenge faced by the hotels sector in 2026. Even as the city was a 2025 outlier by seeing an increase in visitors and hotel revenue, New York hotels gross operating profit remained under pressure. The city's blend of regulation, energy inflation and incentives creates a strong opportunity for digital twin, real-time monitoring and AI-driven optimization approaches.

Utility costs are rising structurally

Electricity and gas delivery rates approved to increase through 2028, adding long-term upward pressure to operating expenses for energy-intensive assets such as hotels.



Source: New York State Public Service Commission, (Cases 24-E-0060 & 24-G-0061)

■ First increase ■ Cumulative increase

LL97: Emissions non-compliance as regulatory risk and financial exposure

Local Law 97 imposes strict emissions limits on large buildings, including hotels. Non-compliance results in fines of \$268 per metric ton of CO₂ above permitted thresholds, creating recurring financial exposure for energy-intensive hospitality assets. Compliance requires continuous monitoring, optimization, and investment in building performance improvements.

Financial incentives are in place for commercial buildings that can demonstrate sustained, verifiable energy efficiency

Con Edison, the primary electricity and gas utility serving New York City and Westchester County, offers the RTEM program to incentivize energy monitoring and optimization in commercial buildings like hotels – single building or portfolios. Eligibility criteria include average electric demand of at least 100 kW or annual electricity consumption of 800,000 kWh or more.

Case Study

Rapid Impact in a Luxury Hotel in New York City with Con Edison Incentives

210K

sq ft floorspace

800

data points
integrated

85%

First year ROI

5 months

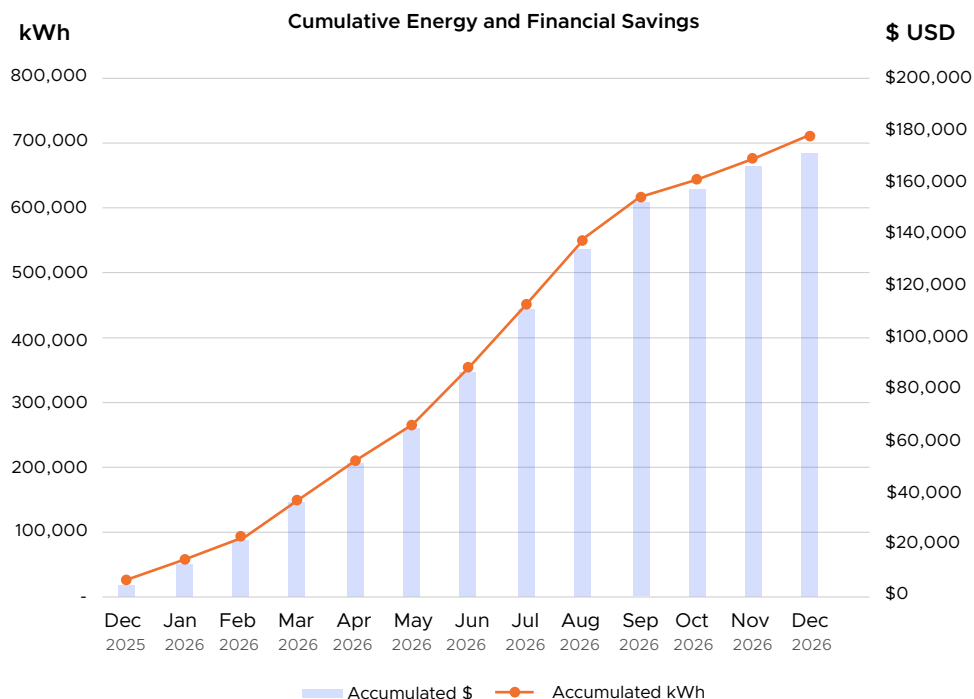
Payback period

Akila's Digital Twin platform was deployed at a luxury hotel in Manhattan's Meatpacking District, integrating directly with the existing Building Management System to create a real-time operational model of the building, connecting across energy systems and critical equipment.

Within the first six months of operation, results were immediate and measurable. Cumulative electricity achieved savings reached 214,800 kWh and is expected to grow to 750,000 kWh by month 12 as optimization scaled.

Based on measured performance and continued optimization, the project is projected to deliver approximately \$180,230 in electricity cost savings, with an estimated 85% first-year ROI and a payback period of around five months.

The deployment also enabled the hotel to qualify for Con Edison's Real-Time Energy Management (RTEM) incentive program, demonstrating a model that can be replicated across hotel portfolios (more detail on next page).



Case study: Securing ConEd RTEM Incentive

From Digital Twin to Verified Energy Incentives

\$118K

Total Savings YTD

\$8+BN

annual utility
energy-efficiency program
spending in the U.S. (ACEEE)

To support the optimization work, Akila used platform data to create a real-time energy monitoring and reporting dashboard for the client. Equipped with detailed and verifiable performance insights, the hotel was able to successfully qualify for Con Edison's Real-Time Energy Management (RTEM) incentive program, covering \$66,000 of project costs the maximum incentive amount applicable for the Akila solution.

Beyond New York, many major cities across the U.S. and globally offer similar compliance and efficiency incentives. Akila works with clients in hospitality and other sectors to help properties qualify for these programs based on platform deployment and verified performance.

Step 1



Contact an Akila representative to learn more about our platform and services and confirm whether your property is eligible.

Step 2



Akila will conduct an initial audit of your property and request historical energy data and utility bills.

Step 3



If your property is deemed eligible, Akila will support the submission of the application and work to secure the available incentive.

Step 4



Akila will propose a tailored solution based on your needs and the findings from the audit.

Step 5



Once the contract is executed, Akila will order any required hardware (sensors and meters) and begin installation and configuration of the solution.

Step 6



Akila will coordinate with your system integrator and work with integrating the Building Management Systems data points into the Akila platform.



How the Tech Works

Akila's technology is designed to unify fragmented building systems, transform operational data into real-time intelligence, and deploy AI-driven optimization that delivers measurable energy, cost, and carbon reductions, without requiring major capital investment or system replacement.

System Architecture and Data Integration

Akila operates as a hardware-agnostic, cloud-native Real-Time Energy Management (RTEM) and optimization platform that integrates directly with existing Building Management Systems (BMS), Energy Management Systems (EMS), IoT sensors and distributed HVAC control infrastructure. At the site level, Akila connects to HVAC controllers, energy meters, and other operational technology using open industry protocols such as BACnet/IP, BACnet MSTP, Modbus, OPC UA, and MQTT.

Where a supervisory BMS exists, Akila integrates through the existing BAS network via a secure edge gateway. In buildings with only local DDC controllers, the same gateway securely aggregates control points, energy data, and system telemetry. Data is transmitted via HTTPS over wired Ethernet or cellular (4G/LTE), enabling deployment across a wide range of IT environments and building configurations.

This architecture enables Akila to ingest real-time operational data, such as temperatures, pressures, flows, equipment status, runtimes, and power consumption, without disrupting existing control logic or vendor ownership of the BAS.

Digital Twin and Data Normalization

Once connected, Akila structures incoming data within a live digital twin of the building and its energy systems. HVAC equipment, zones, meters, and control points are normalized into a standardized data model, allowing consistent analytics across diverse building types and portfolios. This digital twin acts as a single source of truth, linking spatial context, equipment behavior, energy consumption, and operational performance.

By standardizing historically siloed data, Akila enables portfolio-wide benchmarking, cross-building comparison, and scalable optimization, capabilities that are not achievable with traditional, site-specific BMS tools.

Baseline Development and Measurement

Akila establishes energy baselines using a transparent, IPMVP-aligned methodology consistent with monitoring-based commissioning and RTEM best practices. Historical energy and operational data (typically 6–12 months) are analyzed to define pre-optimization performance under normalized conditions. Baselines incorporate time-of-week patterns, weather normalization, occupancy schedules, and equipment operating states.

Rather than relying on static assumptions, Akila uses live data streams to continuously improve the models used to calculate savings. Savings are determined by comparing normalized performance during the reporting period against a fixed baseline, enabling verified and defensible measurement of both energy and demand impacts over time.

This approach supports utility incentive requirements while ensuring that savings persistence is continuously tracked and validated.

AI-Driven Analytics and Optimization

At the core of the platform is Akila's AI analytics engine, which goes beyond traditional rule-based control. Akila continuously analyzes hundreds of real-time inputs across HVAC systems, energy meters, environmental sensors, and operational schedules. Machine-learning models forecast short-term and day-ahead thermal and electrical demand, accounting for weather, occupancy, and building thermal response.

Using these forecasts, Akila evaluates multiple operational scenarios through simulation and selects the most energy- and cost-efficient control strategy while maintaining occupant comfort and equipment constraints. The system dynamically adjusts setpoints, staging, sequencing, and load distribution across chillers, pumps, cooling towers, air handlers, and terminal units.

Unlike static BMS logic, Akila's closed-loop optimization adapts continuously as conditions change. Control actions are issued through existing control points, and operators retain full visibility and override capability at all times..

Beyond HVAC: Integrated Energy, Carbon, and Maintenance Intelligence

While HVAC optimization delivers some of the fastest and most immediate savings available through software-driven optimization, Akila is designed as a multi-suite platform that amplifies value across building operations. The Energy Suite provides real-time electricity, gas, water, and thermal monitoring, identifying

inefficiencies such as scheduling drift, abnormal baseloads, and peak demand drivers. AI-driven diagnostics surface actionable insights that can be implemented immediately or prioritized for capital planning.

The Carbon Suite translates verified energy data into auditable Scope 1 and Scope 2 emissions, supporting compliance with evolving regulations and building performance standards. Emissions tracking is automated, transparent, and aligned with recognized reporting frameworks.

The Maintenance Suite links equipment performance and energy behavior to asset health, enabling predictive maintenance and reducing unplanned downtime. Work orders, inspections, and asset histories are connected directly to real-time operational data, aligning energy efficiency with reliability and lifecycle cost reduction.

Scalable, Low-Risk Deployment

Akila's implementation methodology is designed to minimize disruption and accelerate time to value. Most projects leverage existing sensors, meters, and control points, avoiding costly hardware retrofits. Where additional instrumentation is required, Akila supports modular, incremental deployment.

Because optimization is software-driven and layered on top of existing systems, customers can achieve measurable energy and cost savings, often within months, while preserving flexibility for future upgrades, retrofits, and regulatory changes. Our typical deployment time is 3 – 5 months, before we can deliver measurable energy savings.





Conclusion

Future-Proofing Hotel Portfolios in a Turbulent Era

Operational efficiency is no longer optional: Operating costs have grown 4x faster than revenue over the past five years while real profitability remains at ~90% of 2019 levels despite demand recovery.

Utility & energy costs are one of the fastest-growing expense lines. Utilities jumped +5.5% in 2025 alone and are up 27.5% since 2019.

Compliance is becoming mandatory with energy, climate mandates and compliance to regulations are expanding in most states.

Owners want ROI-positive optimization, not heavy renovation programs. "Sweating the asset" is the dominant strategy, requiring a shift to efficiency, automation and optimization.

Hotels that succeed in the coming years will be those that adopt predictive, data-driven operating models. Digital twins offer a scalable path forward, enabling operators to reduce utility costs, strengthen regulatory compliance, and improve asset resilience, transforming energy optimization from a compliance obligation into a strategic advantage.

Akila provides a software-first optimization layer that enables continuous, real-time improvement of energy, HVAC and building operations without major retrofit. By combining live monitoring, AI optimization and digital-twin modelling, the platform helps hotel operators reduce energy use, support compliance and access available incentives while protecting guest comfort and day-to-day operations.



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