ISO 50001 Energy Management System – Case Study

2024 United Arab Emirates

Al Futtaim Real estate

Effectively implemented energy management systems across our various portfolios

Case Study Snapshot	
Industry	Real Estate
Product/Service	Asset management
Location	Dubai, UAE
Energy performance improvement percentage (over the improvement period)	5% improvement in 1 year
Total energy cost savings (over the improvement period)	USD 87,145.8
Cost to implement Energy Management System (EnMS)	USD 267,000
Total energy savings (over the improvement period)	900 MWh
Total CO_2-e emission reduction (over the improvement period)	360 Metric Tons

Organization Profile / Business Case

Our journey at Al-Futtaim Real Estate exemplifies a strategic alignment with sustainability goals through the implementation of ISO 50001. Specializing in retail-focused super regional malls across the MENA region and beyond, our organization has recognized the imperative to integrate environmental stewardship into our operations. This recognition stems from our commitment to the UAE's Net Zero vision and COP28 goals, where we aim to not only enhance operational efficiency but also drive significant energy and cost savings. By establishing an Environmental framework based on ISO 50001, we have embarked on a transformative path, leveraging energy management systems to benefit both the environment and our stakeholders. Through this journey, we aim to set a precedent for the industry while contributing meaningfully to global sustainability efforts.

"Actions to achieve benefits in one category cannot begin without looking at the impact on the other categories and even within the same category. Sustainability is all about balance."

—Felizardo Orticio Jr, Sr. Operations Manager

Business Benefits

The adoption of ISO 50001 at Al-Futtaim Real Estate has yielded multifaceted benefits. Taking Dubai Festival Plaza to exemplify this for the sake of this case:

- Our efforts have resulted in a substantial 5% improvement in energy performance in a year, translating into USD 87,145 in energy cost savings and a commendable reduction of 360 metric tons of CO2-e emissions.
- Despite initial investments totaling USD 267,000 in our Energy Management System (EnMS) capital investment in 2022, our organization has witnessed substantial returns, with cumulative savings exceeding USD 58,600 annually including USD 28, 535 in EnMS implementation. Additionally, a noteworthy 5% reduction in CO2 emissions compared to 2022 levels underscores the efficacy of our approach.
- Beyond financial gains, operational enhancements such as improved equipment reliability and reduced maintenance needs have led to productivity gains and reinforced our reputation as responsible corporate citizens.

Below is the short table as an overview of the difference when adopting ISO 50001.

Item	unit	2022	2023	Variance	% Savings
Carbon footpirnt	tCO_2e	7,569.04	7,208.77	360.27	5%
Energy total	KWhr	18,920,894.00	18,021,799.00	899,095.00	5%
EnMS	KWhr	10,488,694.00	10,165,799.00	322,895.00	3%
Enms Savings	USD	1,584,357.28	1,555,821.30	28,535.97	2%
Capital performance	KWhr	8,432,200.00	7,856,000.00	576,200.00	7%
Capital Saving	USD	1,001,820.82	943,210.96	58,609.86	6%
Amount	AED	9,439,550.06	9,121,467.76	318,082.30	3%
Amount	USD	2,586,178.10	2,499,032.26	87,145.84	3%

The implementation of ISO 50001 has not only driven energy savings but has also fostered operational efficiency and streamlined processes. Through a centralized approach to monitoring and review, we have ensured consistency across diverse sites, thereby accelerating the adoption of energy-saving initiatives.

Plan

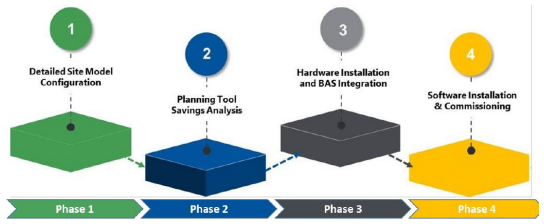
Our strategic approach at Al-Futtaim Real Estate has been meticulously tailored to maximize the benefits of our Energy Management System (EMS), emphasizing key advantages such as cost savings, environmental responsibility, and improved operations:

- Senior management has played a pivotal role in providing visionary leadership, setting clear goals, and allocating resources to drive our sustainability agenda forward. Continuous communication channels have ensured their active engagement and alignment with organizational objectives.
- Securing funding was achieved through a comprehensive business case outlining expected expenses and benefits, including potential savings, incentives, and rollout costs. Priority was accorded to high-return areas to optimize resource allocation.

- Our strategy was underpinned by extensive energy audits, enabling us to gain deep insights into usage patterns and identify areas ripe for improvement. This involved a thorough analysis of bills, facility inspections, and real-time usage data monitoring, which formed the basis for tailored action plans.
- Regular reviews have been instrumental in tracking progress and identifying optimization opportunities. Key performance indicators (KPIs), including energy intensity, reductions in greenhouse gas (GHG) emissions, and cost per unit, were closely monitored to refine strategies and drive continuous improvement.
- Project selection was guided by rigorous criteria, focusing on impact, cost-effectiveness, and alignment with organizational goals. Utilizing a matrix-based approach, projects were ranked based on their potential for savings and implementation complexity, ensuring resources were directed towards initiatives with the highest return on investment.
- Drawing from insights gleaned from our ASHRAE level 1 & 2 audit and intensive review, we have strategically planned to optimize our chilled plant system. This project exemplifies our commitment to implementing targeted initiatives aimed at driving energy efficiency and reducing environmental impact.

Annual Chiller plant consumption - 2022	
Description	Value
consumptions taken from MV panels for Chillers: 1. two (2) chillers connected to one MV Panel 2.MV panel / Premise numbers 591-90840-9 & 591-90841-7	8,335,844 KWh
Auxiliaries Calculated based on Chillers baseline as no separate meters for 1.30% Additional on Chillers Baseline 2. (Primary pumps, Condenser Pumps and Cooling Towers)	2,500,753 KWh
Total Plant Baseline	10836597 KWh
Tarif Considered AED/KWh	0.43 AED/KWh
Total Plant Baseline AED	4,659,736.80

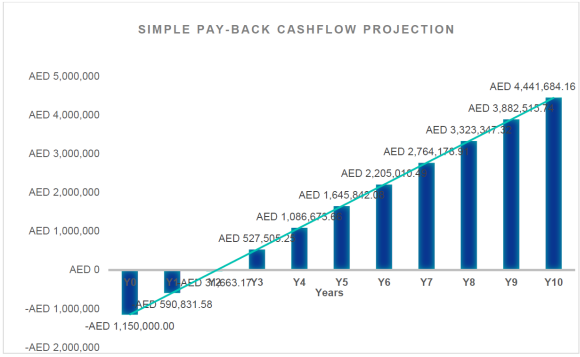
DFP annual Chiller consumptions – our baseline



Optimization plan project phases

Chiller Plant Optimizer	
Estimated Plant Baseline Electricity Use (kWh/yr)	10,836,597
Estimated Plant Baseline Utility (AED/yr)	4,659,737
Minimum Utility Cost Savings %	12%
Projected Cost Savings (AED/yr)	559,168
Solution Cost (AED) (CPO cost)	974,650
Simple Payback (Years)	**1.74**
Notes:	
• Post Saving Calculations = (Baseline KW/TR – Post KW/TR) * TRH	

Savings & ROI Calculations:



Payback Calculation

Our approach to Capitalization project

Detailed task elements of the phases of Energy Optimization projects plan as follows:

Phase 1 - Equipment Models Fits, Safety Constraints, and Input Data Cleansing

• Create Cooling load profiles for a year-long period based on trend data or design assumptions for the building use type and climate zone.

• Gather accurate as-built equipment schedules and nameplate data (model/serial #s)

• Review written control sequences or control logic program and analyze existing trend data within plant automation systems to clearly define baseline & other operating assumptions and parameters.

Phase 2 –Model Development and Simulation Testing

• Use historic trend data to develop plant-level or plant subsystem-level power performance models.

• Simulate utility cost with Optimal Control and calculate savings

• Support meetings with the Plant Operations team to ensure control strategies are feasible and aligned with any site-specific policies or operating constraints

• Update business case summary of utility cost savings that can be achieved.

Phase 3 – Hardware Supply, Installation, and Integration

- Supply and install new filed devices / sensors.
- Supply, install and integrate new IO modules, VFDs & PMUs

Phase 4 – Installation & Commissioning

• Identify and configure new control Optimizer logics

• Final Completion and Warranty Period Begins

Phase 5 – Monitoring Period

• Tracking Meetings after installation to track any constraints and stabilize the plant

• Additional Plant Operator Training Sessions.

- The EMS closely aligns with our broader objectives, such as sustainability and operational efficiency. Regular reviews ensure it stays on track with evolving priorities.
- We adopted a centralized approach for consistency in monitoring and managing GHG emissions across our portfolio of sites. Our system's interface generates monthly reports, ensuring scalability and uniformity in our energy management efforts.

"By integrating considerations of energy related GHG emissions throughout our EMS planning activities, we ensured that our energy management efforts not only improved efficiency but also contributed to environmental sustainability by reducing our carbon footprint."

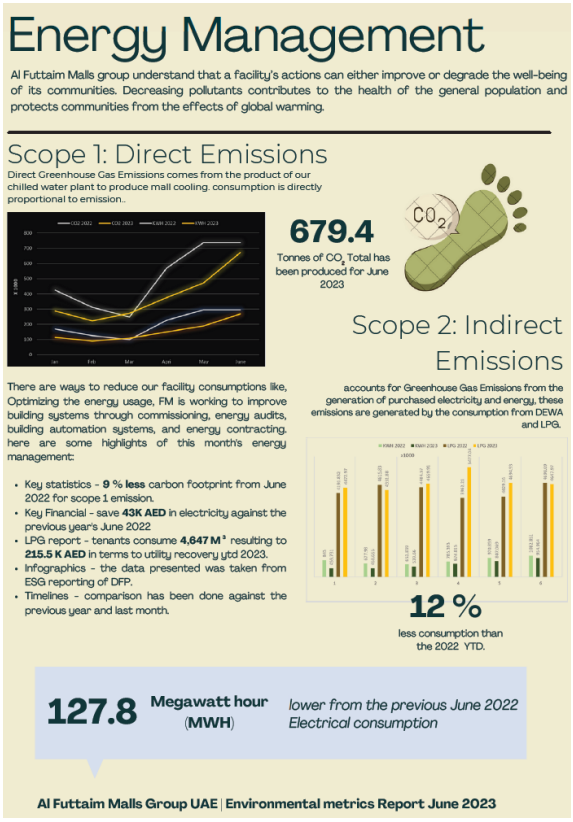
—Felizardo Orticio Jr, Sr. Operations manager

Do, Check, and Act

At Al-Futtaim Real Estate, the implementation of our energy management plan followed a systematic and collaborative approach, involving various departments and sites. Here's an overview of our methodology:

- A cross-functional team was formed, comprising members from different departments and sites, coordinating efforts and ensuring alignment across the organization. Communication channels were established to facilitate knowledge sharing and keep all stakeholders informed.

- Top management played a pivotal role in supporting the plan by providing resources and motivation. They emphasized the importance of energy management and set clear goals for improvement, thereby fostering a culture of sustainability throughout the organization.
- Energy audits were conducted to assess current usage patterns and identify areas for improvement. Measures such as upgrading lighting and optimizing equipment schedules were implemented to drive energy savings. Additionally, employee education programs were initiated to raise awareness about energy efficiency practices.
- Targets were established based on assessments, with progress monitored regularly. Strategies were adjusted as needed to ensure the attainment of these targets, reflecting our commitment to continual improvement.
- To measure improvement, baselines were established, and key indicators such as energy intensity and cost per unit were utilized. Factors such as building size and occupancy were taken into consideration to ensure accurate assessment.
- Equations were employed to estimate energy savings, accounting for changes over time and external factors such as weather conditions. Data normalization techniques were applied to maintain accuracy in our assessments.
- Utilization of tools such as energy monitoring software and Computer-Aided Facility Management (CAFM) systems provided visibility into energy consumption patterns. Additionally, employee training materials were developed to support our energy-saving initiatives and foster a culture of sustainability.
- Our concerted focus on reducing energy consumption not only resulted in tangible savings but also contributed to lower greenhouse gas emissions. We actively promoted measures like the utilization of renewable energy sources to further minimize our environmental impact, reflecting our commitment to sustainable practices. To measure improvement, we established baselines and used indicators like energy intensity and cost per unit. We considered factors like building size and occupancy.



Sample monthly report.

Transparency

At Al-Futtaim Real Estate, transparent communication has been pivotal in fostering stakeholder engagement and showcasing our commitment to sustainability:

- Our sustainability reports serve as a comprehensive platform where we openly share our energy-saving achievements with stakeholders, investors, and the public. These reports provide detailed insights into our progress, initiatives, and the impact of our Energy Management System (EMS), reinforcing our dedication to environmental stewardship.
- Direct engagement with key stakeholders, including customers, suppliers, investors, and the community, has been instrumental in conveying the significance of our certification.
- Through personalized communication channels, we have articulated the value proposition of our EMS, emphasizing its role in driving energy efficiency and reducing our environmental footprint.
- Strategic press releases have been disseminated to a wide audience, spanning newspapers, industry magazines, and online platforms. These releases have effectively communicated the success of our energy management system and underscored our unwavering commitment to sustainability, further amplifying our impact and reach.
- Our digital presence, including our website and social media platforms, serves as a dynamic showcase of our energy-saving efforts and the journey towards certification. By highlighting our achievements, certification process, and the positive outcomes of our sustainability initiatives, we aim to inspire and engage our online audience, driving awareness and advocacy for sustainable practices.

What We Can Do Differently

Future Outlook and Continual Improvement

Looking ahead, we are committed to advancing our ISO 50001-certified Energy Management System (EMS) at Al-Futtaim Real Estate through proactive measures:

- Expanding the scope of our EMS is paramount, as we aim to include additional sites and operations within our organization. This expansion will entail thorough energy audits, the establishment of new targets, and the implementation of best practices across all facilities.
- Embracing emerging technologies such as robust carbon footprint assessment, IoT sensors, and energy management software will be instrumental in augmenting our monitoring and control capabilities. This will enable real-time tracking of energy usage, empowering proactive decision-making to optimize efficiency.
- Active stakeholder engagement remains a cornerstone of our strategy. We are dedicated to fostering collaboration and garnering support for our energy management initiatives from employees, suppliers, customers, and regulatory agencies. This entails sharing regular progress updates, soliciting feedback, and raising awareness about the significance of energy conservation.
- Ensuring ongoing compliance with ISO 50001 standards is non-negotiable. We are committed to conducting regular audits, maintaining meticulous documentation, and promptly addressing any non-conformities to uphold the integrity of our Energy Management System. This steadfast commitment to excellence underscores our dedication to continual improvement and sustainability.