ISO 50001 Energy Management System – Case Study

2024 UNITED ARAB EMIRATES

ENOC TASJEEL

ISO 50001 certified sites by implementing energy saving projects like LED retrofits in Tasjeel Vehicle Testing Stations

Case Study Snapshot	
Industry	AUTOMOTIVE
Product/Service	VEHICLE TESTING
Location	DUBAI
Energy performance improvement percentage (over the improvement period)	29 % improvement over 4 years
Total energy cost savings (over the improvement period)	USD 26,798.00
Cost to implement Energy Management System (EnMS)	USD 14,600.00
Total energy savings (over the improvement period)	169 MWh
Total CO_2-e emission reduction (over the improvement period)	70.63 Metric Tons

Organization Profile / Business Case

Tasjeel is a business unit of Emirates National Oil Company (ENOC) - Retail Business Segment (RBS). We provide service to vehicle owners on behalf of Road & Transport Authorities in Dubai, Sharjah, & Ras Al Khaimah based on the standard requirements for vehicle testing, compliance & registration of vehicles; both light and heavy. Tasjeel is the result of a strategic partnership with RTA in Dubai, Sharjah Police (SP) in Sharjah and with Government of Ras Al Khamia (GRA) in Ras Al Khaimah. Earlier in 1999 with the support of the Dubai Traffic Police the first dedicated high-tech testing & registration facility was established by Tasjeel at Al Qusais, in Dubai. Since then, the relationship between Tasjeel and the Dubai Police (now RTA) as well as with Sharjah Police has been strengthened and now operates various Tasjeel vehicle testing and registration centers in Dubai, Sharjah, and Northern Emirates.

Being the pioneer in vehicle testing industry, we have kept our priority to meet the targets as per national agenda of energy conservation. We have initiated and completed several projects across our various sites to save energy. Conventional light replacement to LED was performed at all major sites to ensure the energy consumption is kept optimal. By identifying significant energy users and continuously monitoring energy consumption has helped Tasjeel to identify improvement areas and necessary actions to take mitigative steps to reduce consumption. Our energy saving initiative is part of our enoc group sustainability KPI. There is a total of 17 KPI which includes energy consumption, water consumption and emissions.

"At Tasjeel, we strive to energy conservation by adopting latest technologies to meet the national agenda, and to comply with a international standards in energy like ISO 50001"

— Husam Al Shawi, General Manager, Tasjeel

Business Benefits

Implementing ISO 50001 has yielded significant benefits for our organization, both in terms of energy performance improvements and broader business impacts. Here's an overview of our experience:

Through the implementation of ISO 50001 Energy Management System (EnMS), we have achieved notable reductions in energy consumption and associated costs. By systematically identifying energy-saving opportunities, optimizing processes, and implementing energy-efficient technologies, we have realized substantial energy savings across our operations. These savings translate directly into cost reductions, enhancing our bottom line. Additionally, our efforts have resulted in a reduction in emissions, contributing to our environmental sustainability goals.

There were initial investments in implementing the EnMS, including costs associated with staff training, system development, and implementation. These expenditures have proven to be highly worthwhile. The estimated staff time dedicated to the implementation process has been significant, reflecting our commitment to thoroughness and excellence in execution. However, the returns on these investments, in terms of energy cost savings and other benefits, have far outweighed the initial costs.

Implementing ISO 50001 across multiple sites has allowed us to achieve synergies and economies of scale in energy management. By standardizing processes, sharing best practices, and leveraging centralized resources, we have optimized our energy management efforts across our entire organization. This approach has facilitated consistent performance improvements and cost savings across all our sites, enhancing overall competitiveness and sustainability.

In summary, our experience with ISO 50001 implementation has been highly positive, resulting in tangible benefits for our organization in terms of energy efficiency, cost savings, and overall business performance. Maintaining certification to ISO 50001 underscores our ongoing commitment to continuous improvement and sustainable operations.

Below is the overview of few improvement initiatives Tasjeel have considered in the business.

- Replacement of conventional lights to LED fixtures. This has straightaway reduced the consumption significantly without compromising the lux levels.
- Replacement of yard lights with LED lights with dimming technology. This has helped the energy consumption to drop further as the lights will function with minimum current when there is no people movement.
- Motion sensors have been installed in all rooms including the washrooms to ensure energy is conserved by minimum manual intervention.
- By allowing maximum of daylight inside the room we have ensured the lights are switched off at areas which are near to glass walls during daytime.
- By identifying appliances with minimum 4-star rating was a remarkable step towards energy conservation.
- Spreading awareness to staff as well as customers through energy saver posters and continuous trainings have developed a culture among people towards energy conservation.

Tasjeel have so far certified 7 of our sites with ISO 50001, where we have considered one of our case studies here which is contributing 29% of energy savings over 4 years, which is equivalent to USD 26,798.

Beyond energy and cost savings, implementing ISO 50001 has generated various non-energy benefits for our organization. These include improved operational efficiency, enhanced reliability of energy supply, and increased awareness and engagement of employees in energy management practices. By fostering a culture of energy efficiency, we have seen improvements in overall organizational performance and resilience.

Plan

Tasjeel ensures management commitment and support for energy management implementation through the ENOC Sustainability team and ENOC maintenance and Engineering team. This team comprises experts from various business units and convenes periodically to oversee energy management initiatives.

Energy management objectives, including energy efficiency targets, KPI's are integrated into the Business Scorecard. Annual targets are agreed upon and set in preparation for implementation in the following year, ensuring alignment with organizational goals.

Implementing Energy Management Systems (EnMS) at multiple sites initial challenges, but with the support of energy sub-metering, significant savings opportunities are identified. Establishing an effective energy aspect register and constant monitoring of energy consumption through utility bills allows Tasjeel to identify the significant areas for improvement and optimize energy usage across its facilities.

To ensure that identified savings opportunities are realized, resources are allocated as part of the annual budget planning process. Investment in energy-efficient technologies and initiatives is prioritized to drive continuous improvement in energy performance.

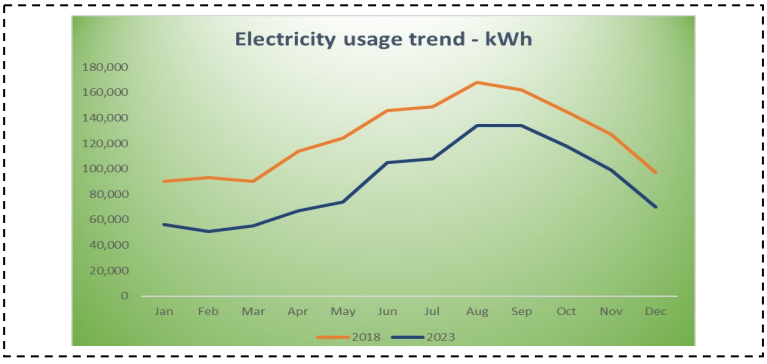
Gathering energy consumption data started with the base year where we could set our target accordingly and upper and lower control limit, we started monitoring energy consumption based on the target given and improving upon this year by year.

The energy project was selected base on significant energy saving and easy to implement specially on existing sites, were we started replacing the old lighting with LED and motion sensor and energy saving AC's.

During the ISO 50001 recertification in 2022, the focus was on enhancing the effectiveness of EnMS approaches and improving energy-saving targets. This represents a shift from merely meeting minimum requirements to actively striving for continuous improvement and maximizing energy efficiency across Tasjeel's operations.

"Contributing efficiently and continuously towards energy saving is our motto. The future generation relies heavily on our act. So, we must act sensibly."

— Abdulla Al Shehhi, Development & Project Services Manager



The trend graph (2018 & 2023) showing significant reduction in energy consumption after improvement initiative.(table1.1)

Do, Check, and Act

Continuous motivation and support from top management are provided to business units and the EnMS team through the ENOC Annual Energy Award, which recognizes achievements in both business unit and individual employee categories. Ongoing EnMS-related training is conducted to enhance management awareness and technical competency.

To fulfill the requirements of our Energy & Resource Management (E&RM) policy, we measure, monitor, and analyze energy and resource utilization to reduce consumption. Detailed understanding of energy consumption breakdown by operational areas is crucial for identifying relevant saving opportunities.

The energy review process requires substantial planning inputs, detailed in subsequent sections, to conduct effective and valuable energy reviews. Expected outputs include practicable and reasonable measures to improve energy performance, leading to continual improvement.

Tasjeel is planning to rollout iso 50001 to all sites, and there will be separate evaluation for each sites and base on the evaluation result the site will put on the plan for energy saving implementation.

The energy savings outlined in the case study are based on a baseline period of one year (2019) and a reporting period spanning the following 4 years (2020-2023).

Tasjeel has decided that 2018 will be the base line for the Energy management system and defined the base load according to 2018 consumption.

The energy performance has had improved in 2023 compared with the base year 2018 refer to (table1.1)

Below are the definitions, equations and related KPI'S of tasjeel energy management system.

Indicators used to monitor and assess energy performance improvements.	1) Thermal Energy Consumption per unit reduction (GJ/car tested) 2) Electrical Energy Consumption per unit reduction (kWh/car tested) 3) Energy Demand reduction from baseline year 2019 (Energy Savings in the reporting period/energy cost in 2019) 4) GHG emission per unit reduction ($kgCO_{2e}$/car tested)
Key high-level equations and explanation to estimate energy savings and energy performance improvement.	1) Thermal Energy Consumption per unit reduction (GJ/car tested) – IPCC factors are used to convert fuel consumption into GJ. The diesel and gasoline consumption in MT is converted to GJ using IPCC factors separately for the reporting period. Then the total is divided by number of cars tested during the same reporting period. 2) Electrical Energy Consumption per unit reduction (kWh/car tested) – this is electricity consumed over the reporting period in kWh divided by numbers of car tested during the reporting period. 3) Energy Demand reduction from baseline year 2019 – Energy cost on account of fuel and electricity in the year 2019 is the baseline

	as per the Dubai Supreme Council of Energy requirements. During the reporting period, E&RM project savings is divided by the 2019 cost to get the energy demand reduction data. 4) GHG emission per unit reduction ($kgCO_2$/car tested) – For Scope 1: GJ of diesel and gasoline are converted to CO_{2e} using the IPCC factors. Then the total kgCO2 for the reporting period is divided by the numbers of cars tested during the same reporting period. For Scope 2: DEWA Grid emission factor, the current factor is 0.4041 tCO_{2e}/MWh, is used to convert electricity consumption into CO_{2e}.
Relevant variables affecting energy consumption.	• Numbers of Cars tested. • Operating hours • Equipment efficiency & their maintenance • Occupancy levels • Temperature and climate
Method(s) to ensure normalization (If normalization was not used, then rationale must be provided).	Normalization was not applied in this case due to the stable operating conditions over the reporting period. The number of cars serviced, weather conditions, and operational hours remained consistent, ensuring that the variations in energy consumption are directly attributable to changes in energy efficiency. Additionally, to maintain simplicity and clarity in our reporting, we opted for number of cars tested data that provides an easily understandable overview of our energy performance.

Table 1.2

EnMS implementation prompted the organization to establish green procurement objectives, supported by a Green Procurement Procedure and a dedicated Green Procurement Analyst. The green procurement target is set at 100% from 2019 onward.

Transparency

Tasjeel takes pride in its achievements in energy management, including ISO 50001 certification. The company actively communicates its efforts and accomplishments to both employees and the public through various channels.

Tasjeel shares the annual data with ENOC group to publish in the annual Energy Efficiency and Sustainability Reports that showcase collective energy-saving initiatives across the group and its business units. These reports are available to everyone on the company website https://www.enoc.com/en/ and distributed at energy-related conferences ENOC sponsors or attends.

Tasjeel displays its ISO 50001 certificates at each site, demonstrating its commitment to energy efficiency to customers.

What We Can Do Differently

Throughout the EnMS implementation period, several valuable lessons have been learned across various aspects of energy management. Here are some key areas identified:

The importance of having a robust online data management system cannot be overstated. Such a system is essential for timely monitoring and effective analysis of significant energy users (SEU), enabling proactive management of energy consumption.
There is a need to improve the verification methodology of SEU performance results. By refining the verification process, organizations can ensure the accuracy and reliability of energy performance data, facilitating informed decision-making.

Converting manual energy aspect registers to software or online platforms enhances accessibility and efficiency in managing energy-related data. This transition streamlines processes and improves data accuracy and integrity.

Enhancing internal benchmarking approaches and selecting appropriate external benchmarks are crucial for evaluating energy performance and identifying improvement opportunities. Benchmarking allows organizations to gauge their performance relative to industry standards and best practices.

When constructing new sites, organizations should consider integrating renewable energy projects. Incorporating renewable energy solutions into refurbishment projects promotes sustainability and reduces reliance on conventional energy sources.

There should be a concerted effort to enhance the effectiveness of the Energy Management System (EnMS) for additional sites within the region. Understanding the benefits of EnMS implementation and tailoring strategies to maximize its impact are essential for achieving energy management objectives across all sites.

By learning from these key areas and implementing corresponding improvements, organizations can optimize their energy management practices, drive efficiency gains, and contribute to sustainability objectives effectively.