

ISO 50001 Energy Management System – Case Study

2024

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Dubai Lubricants Processing Plant – JA

Also known as ENOC Lubricants and Grease Manufacturing Plant -JA)

Energy Saving initiatives and retrofit projects in compliance to the ISO 50001 standards at ENOC Lubricants



Case Study Snapshot

Industry	Oil and Gas
Product/Service	Lubricants
Location	Jebel Ali – Dubai
Energy performance improvement percentage (over the improvement period)	31 % improvement over 5 years
Total energy cost savings (over the improvement period)	USD 77500.60
Cost to implement Energy Management System (EnMS)	USD 13982.00
Total energy savings (over the improvement period)	748.5 MWH
Total CO₂-e emission reduction (over the improvement period)	147.8 metric tons

Organization Profile / Business Case

ENOC a wholly owned Government of Dubai company is a leading force for economic diversification within the UAE. It is also a global energy group, operating 30 active subsidiaries and joint ventures – many forged with key international blue chip organizations.

The Dubai Lubricant Processing Plant -Jebel Ali has annual production capacity of 30000 KL of lubricants, Brake fluid, and Grease on double shift (24 hrs. X 6 Days) basis.

Dubai Lubricant Processing Plant -Jebel Ali is responsible for procurement and storage of raw materials, blending, filling, warehousing and dispatch of ENOC branded and third party lubricants, coolants and Greases

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Dubai Lubricant Processing Plant produces a full range of lubricants, coolants, Turbine oil and Greases, filled into small packs, drums and bulk, ideal for both retail and industrial sector. Dubai Lubricant Processing Plant is capable of designing its products and is design responsible for ENOC products.

Improving energy performance, reducing consumption of electricity and water, improving overall energy efficiency, play a part in reducing greenhouse gas emissions and advancing its knowledge on energy, was a big challenge for Dubai Lubricant Processing Plant In order to overcome all said issues, Dubai Lubricant Processing Plant decided to get certified to ISO 50001 Environmental Management System (EnMS).

Location:

Manufacturing Plant – Jebel Ali

Dubai Lubricants Processing Plant – JA

Plot # MO 0518 & MO 0519, JAFZA,P.O. Box: 263717, Dubai, Jebel Ali, United Arab Emirates.

Business Benefits

Here are business benefits for ENOC and its Lubricants Division:

1. **Diversified Revenue Streams:** By operating in various sectors, including retail and industrial, ENOC can tap into multiple revenue streams, reducing its dependence on any single market and increasing its financial stability.
2. **Strategic Partnerships:** ENOC's collaborations with international blue-chip organizations enable it to access new technologies, markets, and expertise, fostering innovation and growth.
3. **Vertical Integration:** DLPP's involvement in procurement, storage, blending, filling, warehousing, and dispatch allows ENOC to control the entire value chain, ensuring quality, efficiency, and cost savings.
4. **Product Design Capabilities:** DLPP's ability to design products and assume design responsibility for ENOC-branded products enables the company to differentiate itself in the market, meet customer needs, and stay competitive.
5. **Sustainability and Energy Efficiency:** Achieving ISO 50001 certification for DLPP-JA's Environmental Management System (EnMS) demonstrates ENOC's commitment to sustainability, energy efficiency, and environmental stewardship. This commitment can lead to reduced energy costs, improved brand reputation, and access to environmentally conscious customers and partners.
6. **Scalability:** With two manufacturing plants and a wide range of products, ENOC has the capacity to scale its operations and meet increasing demand from various sectors, both locally and internationally.
7. **Local Presence and Global Reach:** ENOC's presence in the United Arab Emirates, specifically in Jebel Ali and Fujairah, allows it to serve local customers effectively while maintaining a global footprint through its partnerships and subsidiaries.

These benefits are contributing to ENOC's position as a leading force for economic diversification within the UAE and a global energy group.

Plan

The top management of ENOC was involved in the implementation process of the Energy Management System (EnMS) in the following ways:

Commitment to sustainability: The top management demonstrated a commitment to sustainability and energy efficiency by deciding to get certified to ISO 50001 Environmental Management System (EnMS). This commitment have been driven from the top, setting the tone for the organization's approach to energy management.

Resource allocation and Approvals: The top management have allocated the necessary resources, including the budget of USD 13982.00, to implement the EnMS. This allocation have been a deliberate decision to invest in energy efficiency and sustainability.

Strategic alignment: The implementation of the EnMS have been aligned with the organization's overall strategy, which includes diversification, strategic partnerships, and sustainability. The top management have ensured that the EnMS implementation has been aligned with these strategic objectives. Director lubricants also attend Energy management review and discuss targets and continual improvement.

Monitoring and evaluation: Although not explicitly stated, it can be assumed that the top management have been involved in monitoring and evaluating the progress of the EnMS implementation, including the energy performance improvement percentage, total energy cost savings, and total CO₂-e emission reduction.

The DLPP top management played a crucial role in setting the direction, allocating resources, and ensuring strategic alignment for the implementation of the EnMS.

DLPP obtained financial commitments and resources for the implementation of the Energy Management System (EnMS) in the following way:

Budget allocation: The organization allocated a budget of USD 13982.00 (only for solar other are separated as below picture) for the implementation of the EnMS. This budget allocation have been approved by the top management, finance director demonstrating their financial commitment to the implementation of ISO 50001.

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Internal funding: the funding for the EnMS implementation came from internal sources also, funds provided for metering system as per the E&RM plan (mention below). DLPP top management prioritized energy efficiency and sustainability, allocating internal resources to support the initiatives e.g. solar, water recycling, solar A/C etc. the process of obtaining financial commitments and resources, DLPP developed E&RM plan and allocating internal funding, prioritizing energy efficiency and sustainability, and recognizing the business benefits of the EnMS implementation.

DLPP E&RM Plans:

Some examples are appended below. If required, detailed E&RM plan can be shared.

Company Name : DLPP		Date: 5.04.16												
Year Submitted	S No	Proposed action	Dates			Verification method			Energy/resource savings/year			AED/year		Status
			Start	End	Responsible	Method ref	Verification method	Resource	Savings absolute	Unit	savings %	Invstmnt	Savings	
2016	1	Installation of turbo roof ventilators in Production hall and warehouses	Q4 2016	Dec-17	Ahmad	SOP-01-08	Calculation	Electricity				26,000		achived
2016	2	Installation of dual Flush system	Q3 2016	Aug-17	Faheem	SOP-01-08	Calculation	water	21,600			1,000	756	achived
2017	3	LED Installation in ELOMP-JA Plant	Q1 2017	Mar-17	Wael + Faheem	SOP-01-08	Metering/calculation	Electricity				35000		achived

S.No.	Year of Project Proposal	Project Title	Resource	Unit cost of resource		Timeline			2016			2017			2018			
				Start (date) of Project Implementation	Date of Commissioning	Purchase Order Number	Total	Total	Total	Total	Total	Total	Total	Total				
1	2016	<p><i>Short title of the project implemented</i></p> <p>The Rooftop solar PV Power generation system (160kWp) will be introduced in ELOMP-JA in compliance of the UAE commitment that UAE has decided to raise its clean energy target from 24% to 25% by 2021 as part of its commitment to global efforts to fight climate change. ELOMP-JA will fix high efficient, modular, extendable and cost effective power generation solution. The savings made on energy costs will help us to directly benefit, contributing to company growth and increase reputation of ENOC in GCC region.</p> <p>Salient Features and Benefits of System:</p> <ul style="list-style-type: none"> I A clean, silent and eco-friendly source of power I Solar modules convert sunlight into electricity without pollution. I Energy Independence. I Protection against future escalation of energy costs I Available throughout the year. 	Electricity	523000	AED	Jan-16	Mar-16	11201743										523000
2	2016	<p>Water Recycling</p> <p>Water recycle from September 2016. Abulation has now been carried out in garden area in order to irrigation of plants</p> <p>Water used in Abulation: 3 Lit. per Abulation</p> <p>Abulation frequency: 0 times per day (Avg. three prayers)</p> <p>total person: 6 to 8 daily</p> <p>Water consume: 300 x 7.25 = 1575 Lit</p> <p>Expected water consumption in L/D: 1575 Lit</p> <p>Water Calculation through Metering (Meter no 10)</p>	Water	500	AED			Cash										
3	2016	Water Saving (LG = 0.05AED)																

DLPP used data to help develop an appropriate approach for improving energy performance and reducing energy consumption at the Dubai Lubricant Processing Plant (DLPP) in the following way:

Data collection: The first step in understanding energy consumption and use was to collect data on energy usage patterns, including electricity and water consumption. This data have been collected from various sources, such as utility bills, energy meters, and production data. Daily 05:0 am data is being collected ny the competent and trained staff. After that data entered on prescribed format. Five years data available. One example appended below

Manual Data recording: first DLPP gather energy reading manually. After the electronically recorded.

Data analysis: Once the data was collected, it was analyzed to identify trends, patterns, and areas of high energy consumption. This analysis helps to identify opportunities for energy savings and efficiency improvements. This also discuss with top management during MRM. EnPI discussed during the MRM.

Identification of energy efficiency measures: Based on the data analysis, ENOC identified various energy efficiency measures that could be implemented to reduce energy consumption and improve energy performance. These measures are prioritized based on their potential impact, feasibility, and cost. DLPP identified following significant energy users as per the below criteria.

Criteria:

Ref: WI-01-06 Rev. 3					
Criterion 1 (High use)			Criterion 2		
Energy Source	Range	Rating	Electrical energy	Savings < 3.5%	Not significant
Diesel	Less than 30%	Not significant	Diesel	Savings >= 3.5%	Significant
	>= 30%	Significant		Savings < 25%	Not significant
Electrical Energy	Less than 10%	Not significant	Electrical Energy	Savings >= 25%	Significant
	>= 10%	Significant			

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S.No	Energy Users	Power (KW)	Actual Consumption (KW)	Duty cycle in term of hours of operation	KWH/Day	KWH/Month	KWH/Year	% Of total Electricity Consumption	Significant
1	IT/EQUIPMENT	1.60	1.60	97.00	11.296	300.88	3610.56		
2	Lights	0.60	2.72	36.00	61.77	1550.78	18609.36	1.75	No
3	AC's	16.50	18.15	47.00	97.90	2678.50	24106.50	9.50	yes
4	Security/Safety	0.02	0.33	48.00	7.92	237.60	2851.20	12.30	Yes
5	Laboratory	25.45	26.99	92.06	75.49	1887.29	22647.54	1.46	No
6	Pumps	75.00	82.50	37.00	218.90	5472.50	65670.00	11.56	Yes
7	Filling Machine	17.99	17.99	56.00	53.36	1334.10	16009.20	33.52	Yes
8	Utilities	30.48	28.55	86.20	153.16	3829.00	42610.50	8.17	No

Monitoring and evaluation: After implementing the energy efficiency measures, ENOC is monitoring and evaluating their impact on energy consumption and performance. This monitoring and evaluation is being done using data, such as energy consumption data, production data, and financial data during the group sustainability audits, internal and external audits (twice a year). Energy data evaluation reports are maintained in HSE department.

Continuous improvement: Based on the monitoring and evaluation, ENOC has implemented continuous improvement measures to further optimize energy performance and reduce energy consumption. This have involved ongoing data collection, analysis, and evaluation. In 2015 sustainability score was 58.9 now we are touching 99%



Energy review in DLPP, is done every year and discuss with energy team. Based on Energy review, SEUs identified and E&RM projects are established with the help of group sustainability. Some examples / evidences mentioned above. ENOC has a robust sustainability mechanism in place to measure group, segment, business unit (BU) and department performance. Our sustainability index is part of the annual balanced scorecard, consisting of 21 KPIs. Out of these, 10 KPIs focus on Energy and Resource Management (E&RM), 10 on Social Sustainability, and 1 on Economy-related performance.

To achieve these KPIs, we have sound governance structures, including committees such as the ENOC E&RM and Climate Change Steering Committee, ENOC E&RM Technical Committee, and ENOC CSR Steering and Technical Committees. These committees, particularly the E&RM committees, regularly discuss performance and identify further opportunities for improvement. These opportunities are translated into planned E&RM projects for individual BUs and departments.

The project selection process involves:

- 1. Performance Review and Trend Analysis:** Based on the previous year's performance and trend analysis of specific KPIs such as thermal energy reduction, electrical energy reduction, GHG reduction, flare gas emission reduction, percentage of water recycled, and percentage of waste recycled, each business unit prepares its annual E&RM business plans.
- 2. Budgeting and Project Incorporation:** These plans include budget proposals and relevant projects aimed at achieving the relevant KPIs mentioned above. The goal is to perform at or above management expectations.
- 3. Project Evaluation:** The ENOC Sustainability team reviews these projects based on several criteria:
 - Feasibility: Assessing whether the project can be realistically implemented within the given constraints.
 - Relevance: Ensuring the project aligns with our sustainability goals and strategic priorities.
 - Cost-Benefit Analysis: Evaluating the economic viability and potential return on investment of the project.
 - Peer Group Analysis: Comparing with industry standards and best practices to ensure competitiveness.

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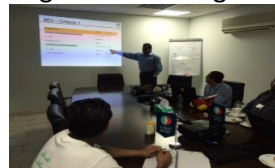
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4. Selection and Approval: Projects that meet these criteria are selected and approved for implementation. By following this structured approach, ENOC ensures that resources are focused on projects with the highest potential impact on sustainability and energy efficiency, driving continuous improvement in our environmental performance.

Do, Check, and Act

Project plan was developed w.r.t ISO 50001 standard. Energy team was established i.e. production supervisor, maintenance, QC lab, logistic and HSE. Trainings were arranged (some pics appended below). EnMS was implemented in only one location. In below pics Radha delivering EnMS training & Faheem Ahmed explained SEUs



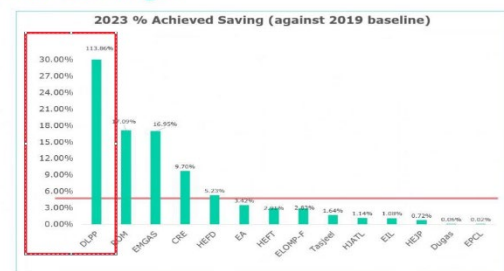
The Idea for renewable energy also approved. Details can be shared if required.

After the successful implementation of the Energy Management System (EnMS) at the Dubai Lubricant Processing Plant (DLPP), the DLPP staff received continuous appreciation from the top management of ENOC. The recognition included cash awards, certificates, and trophies, which were presented during various ceremonies and events. These awards not only acknowledged the efforts and achievements of the DLPP team but also served as a testament to the organization's commitment to energy efficiency and sustainability. DLPP was awarded “Enoc Energy Award 2022 and 2023, best Sustainability champion award 2023, renewable energy pioneer of the year award, and Best Energy Champion Award 2023.

List key activities identified and implemented in the plan that improved energy performance:

- Document EnMS policy and scope
- Conduct gap analysis w.r.t ISO 50001
- Discuss with Plant management
- Resources allocation as per the gap analysis
- Gather energy information as per the equipment / devices
- Conduct energy review
- Stansfield criteria for significant energy users (SEUs)
- Identified SEUs
- Initiated projects (E&RM plan)
- Bench marking
- Plan Internal audit
- Energy Management review
- Invite certification body (CB) for 3rd party audit

Achieved Savings



Were the targets achieved: Yes, targets are being achieved and overall saving around 31% energy. Plant is running on renewable energy and as per below graph, in 2023, the **113.8 % saving** reported by group sustainability.

Performance Analysis: Through data analysis, we determine performance and discussed in internal management meeting and MRM. All data is verified on daily base as data display on big screen as shown in below picture.

Timeframes for your baseline and reporting periods: Bassline is 2019, we are reporting data every quarter to group sustainability. Following data provided for GRI (Global report initiatives) reporting.

Indicators used to monitor and assess energy performance improvements:

The following indicators are used to monitor and assess energy performance improvements at the Dubai Lubricant Processing Plant (DLPP):

Energy consumption: The DLPP monitored energy consumption in terms of electricity, diesel and water usage. This helped to identify trends, patterns, and areas of high energy consumption, and to measure the impact of energy efficiency measures.

Energy cost savings: The DLPP tracked energy cost savings resulting from energy efficiency measures. This helped to measure the financial impact of the EnMS and to demonstrate the return on investment.

Energy performance improvement percentage: As per the above provided information's, the DLPP measured the percentage improvement in energy performance over the improvement period. This helped to track progress towards the organization's energy efficiency targets and to demonstrate the effectiveness of the EnMS.

CO2-e/NOx emission reduction: The DLPP tracked the reduction in CO2-e and NOx emissions and resulting from energy efficiency measures. This helped to measure the environmental impact of the EnMS and to demonstrate the organization's commitment to sustainability. A total CO2 emission reduced 307350.91 Kg and NOx = 11.38 kg

Source: <https://www.auroravision.net/ums/v1/loginPage?redirectUrl=https:%2F%2Fwww.auroravision.net%2Fhome%2F>

Energy intensity: The DLPP monitored energy intensity, which is the amount of energy used per unit of production. This helped to measure the efficiency of the production process and to identify opportunities for energy savings.

Energy audits: as explained above, the DLPP conducted regular energy audits to identify areas of energy waste and to recommend energy efficiency measures. This helped to ensure that the EnMS was continuously improving and that energy performance are being optimized.

Relevant variables affecting energy consumption:

Tools and resources were used: The following tools and resources were used to implement the Energy Management System (EnMS) at the Dubai Lubricant Processing Plant (DLPP):

ISO 50001 standard: The EnMS was developed in accordance with the ISO 50001 standard for energy management. This provided a framework for the EnMS, including requirements for energy policy, energy planning, energy use, energy performance evaluation, and continuous improvement.

Energy management monitoring techniques: The DLPP developed a comprehensive data recording and monitoring system with the help of group sustainability ENOC. We used this template to monitor and analyze energy consumption data. This helped to identify trends, patterns, and areas of high energy consumption, and to measure the impact of energy efficiency measures.

Energy data verification: The DLPP conducted regular energy audits to identify areas of energy waste and to recommend energy efficiency measures. This helped to ensure that the EnMS was continuously improving, and that energy performance was being optimized. All data display on big screen and discuss with team on daily bases, if required. Correction action are immediately taken as deviation / Energy incident reported/observed.

Training and awareness programs: as mentioned above, the DLPP provided training and awareness programs to employees to increase their understanding of energy efficiency and sustainability. This helped to engage employees in the EnMS and to ensure that they were aware of their role in energy management.

Performance indicators: The DLPP used performance indicators to monitor and assess energy performance improvements. These indicators included energy consumption, energy cost savings, energy performance improvement percentage, CO2-e emission reduction, energy intensity, and energy audits.

Stakeholder engagement: The DLPP engaged with stakeholders, including customers, suppliers, and regulators, to ensure that the EnMS was aligned with their needs and expectations. This helped to ensure that the EnMS was relevant, effective, and sustainable.

These above tools and resources helped to ensure that the EnMS was effective, efficient, and sustainable, and that it contributed to the organization's long-term success.

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Transparency

ENOC 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.

ENOC publishes 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.

Below data is being provided by group sustainability.

Energy source purchased / imported	Type	Supplier	Unit	2019	2020	2021	2022	2023
Electricity - Import	Non-renewable energy source	DEWA	kWh	-8916	-9348	-39456	-77580	-62568
Diesel oil	Non-renewable energy source	ENOC	Lit	11323.17	12488.7	16806.15	18544.47	16579.75
Fuel Oil (Petrol)	Non-renewable energy source		Lit	6479.68	6694.05	8577.32	7639.82	7597.99
Solar PV	Renewable energy source	ELOMP JA	kWh	153432	153224	157192	125536	133372
Electricity	Non-renewable energy source		kWh	21024	18464	1232	50264	58448

What We Can Do Differently

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.

Enhancing internal benchmarking approaches and selecting appropriate external benchmarks are crucial for evaluating energy performance and identifying improvement opportunities.

Also having an energy consultant will be a good role to have the right Energy implementation approach from the first time.



The Energy Management Leadership Awards is an international competition that recognizes leading organizations for sharing high-quality, replicable descriptions of their ISO 50001 implementation and certification experiences. The Clean Energy Ministerial (CEM) began offering these Awards in 2016. For more information, please visit www.cleanenergyministerial.org/EMAwards.