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New World New Energy New Opportunities

Energy & Efficiency Report

4th Edition | 2021

ENOC at a Glance

Emirates National Oil Company Limited (ENOC) is an integrated oil and gas company based in the United Arab Emirates, operating globally across the energy value chain. Since its inception in 1993 as a wholly owned company of the Government of Dubai, ENOC has contributed immensely to the economic diversification and sustainable development of Dubai.

EXPLORATION & PRODUCTION	SUPPLY TRADING & PROCESSING	TERMINALS	AVIATION BUSINESS	FUEL RETAIL	PRODUCTS

Vision

To be an innovative energy partner, delivering sustainable value and industry-leading performance.

Mission

We deliver world-class sustainable and integrated energy solutions. We do so by striving for excellence in operations, innovation and happiness for our employees, customers and partners.

Key numbers

COUNTRIES	EMPLOYEES	CUSTOMERS SERVED
60+	12,000+	120 mn+

Values

Teamwork

Working together by sharing ownership, responsibilities and outcomes

Integrity

Being honest, truthful, reliable and fair while dealing with all stakeholders

Transparency

Being open, straightforward and consistent in all we do by communicating with clarity, simplicity and precision

Respect

Acknowledge, recognise, and value all stakeholders

Customer Focus

Position customer first in all that we do

H. H. Sheikh Khalifa bin Zayed Al Nahyan

President of the UAE and Ruler of Abu Dhabi

H. H. Sheikh Mohammed bin Rashid Al Maktoum

Vice-President and Prime Minister of the UAE, and Ruler of Dubai

H.H. Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum

The Crown Prince of Dubai and the Chairman of The Executive Council

H. H. Sheikh Maktoum bin Mohammed bin Rashid Al Maktoum

Deputy Ruler of Dubai, and Deputy Prime Minister and Minister of Finance of the UAE

ENOC Board of Directors

H.E. Saeed Mohammed Al Tayer
Chairman

H.E. Abdulrahman Saleh Mohamed Al Saleh
Vice Chairman

H.E. Dr. Abdul Rahman Al Awar
Board Member

Ahmed Buti Saeed Al Muhairbi
Board Member

Ahmed Mohamed Sharaf
Board Member

Hussain Sultan Lootah
Board Member

Qusai Mohammed Al Shared
Board Member

Executive Management

H.E. Saif Humaid Al Falasi
Chief Executive Officer, ENOC Group

Tayyeb Al Mulla
Managing Director,
Supply, Trading and Processing

Zaid Alqufaidi
Managing Director, ENOC Retail

Yusr Hussain Sultan Al Junaidy
Managing Director, HTL

Burhan Al Hashemi
Managing Director,
Commercial and International Sales

Hesham Ali Mustafa
Executive Director, Shared Services Centre,
Group HR and New Business Development

Mohammad Sharaf
Chief Financial Officer

New World, New Energy, New Opportunities

Businesses are no longer confined to the shackles of profit maximisation. Going beyond, they have become agents of change, playing their part in mitigating climate change, in addition to setting newer benchmarks in governance and social responsibility.

As a responsible industry leader, we have been carefully monitoring the changing environment, and responding to it with vigour, developing new-age solutions and avant-garde ways of contributing to this evolving energy story. We are making new investments in energy transition, finding ways to enhance operational efficiency, leveraging data and artificial intelligence and minimising our own carbon footprint in sync with the UAE government's sustainability vision.

We are aligned to the UAE government's commitment of Net Zero by 2050. In addition, we are supporting local agendas such as Dubai Clean Energy Strategy 2050, Dubai Integrated Energy Strategy (DIES 2030) and the Dubai Demand Side Management Strategy 2030 (DSM 2030).

As a leader in adopting sustainability principles, we have spearheaded the Oil & Gas sector's adoption of energy and resource management (E&RM) in the region, incorporating it in our everyday operations. We continue to optimise energy use through continuous innovation and the use of advanced technologies. In the last decade, we have taken significant energy efficiency efforts across different businesses that have not only reduced costs but significantly reduced emissions. We have a climate change mitigation policy leading us towards a low carbon pathway, ensuring the Group is in complete alignment with national and international policy changes.

The year 2021 saw us helm a range of initiatives directed towards achieving our energy goals. Some of these include the introduction of the first smart petrol station with smart design and energy efficient technologies, with plans to ensure similar stations in the future.

We have also created the 'Service Station of the Future' at Expo 2020 Dubai, Awarded LEED Platinum Certification by US Green Building Council (USGBC). It is the first station in the world to achieve this. The construction has been done using carbon fibre, 283 solar PV panels and an on-site windmill. Our ENOC Energy Scholarship programme is helping train the nation's youth in E&RM. Our efforts towards effective E&RM have saved more than 480,000 tCO_2e emissions, and more than AED 250 mn, since 2014. Since 2017, there has been a 9x increase in usage of solar PV at our operations, saving AED 3.2 mn per year.

Looking ahead, we aspire to open 100 renewable energy-powered retail stations in the UAE.

In the coming years, as we expand our presence, championing E&RM priorities will continue to be of paramount importance.

As of April 2022, we have 164 renewable energy-powered (RE-based) retail stations in the UAE and we aim to have 186 RE-based retail stations by end of 2022.

AED 196 mn

cummulative savings since 2014

396,801 tCO_2e

emissions saved

About this report

We embarked on our energy efficiency reporting journey in 2015. It is a bi-annual report that highlights ENOC's achievements and provides updates on our energy and resource management (E&RM) practices.

It is our privilege to present to you the 4th edition of ENOC's Energy and Efficiency Report, which showcases our progress over the past two years in moving towards an energy-efficient future. This report provides insights into the positive impact of energy efficiency efforts implemented across the ENOC Group and demonstrates our commitment to improving energy performance across our operations, spanning the entire value chain.

We will continue to align our efforts with the UAE and Dubai Government's strategies to ensure synergy between our operations and the vision of our leaders.

Scope and boundary

The reporting scope and boundary for our disclosures, unless otherwise stated, cover the operations of ENOC and its subsidiaries.

Data integrity

Collating and reporting energy efficiency data require collaboration from a range of businesses throughout the Group. We have ENOC E&RM Technical Committee Champions, who help in this data collection within the oversight of the Group Sustainability Department.

Other publications of ENOC

The Energy Efficiency Report forms part of a comprehensive suite of publications across economic, environmental, social and governance parameters.

ENOC Sustainability Performance Report 2020

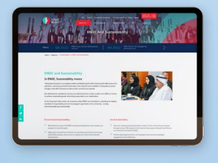
An annual report that highlights the sustainability efforts, achievements and performance aligned with the Global Reporting Initiative (GRI Standards).

ENOC Corporate Social Responsibility (CSR) Report 2020

Provides detailed account of our efforts in crafting our CSR strategy and efforts at being a good corporate citizen.

ENOC Annual Report

Provides a comprehensive account of business performance



Online Reporting

This is a part of the corporate website and provides regular updates on sustainability, such as sustainability policies, documents, report, procedures, performance, events, awards, law & regulations, etc.

Inside the report

Letter from the Group CEO

Dear Stakeholders,

I am pleased to share ENOC's fourth Energy and Efficiency Report. It is the story of our mission to deliver world-class sustainable and integrated energy solutions in order to build an energy-efficient future for all. This Report is also a testament to the positive impact we created through an emphasised focus on operational excellence across our value chain.

It has always been our endeavour to support the UAE and Dubai governments' sustainability vision by investing in energy transition, enhancing our operational efficiency, leveraging data and artificial intelligence, and reducing our own carbon footprint. It gives me great pride to share that we are the official Integrated Energy Partner of Expo 2020 Dubai. We have gone the extra mile in this role with a state-of-the-art pavilion, future mobility station and an innovative digital fuel delivery service.

Moreover, ENOC's Energy & Resource Management (E&RM) strategy is in line with the Dubai Clean Energy Strategy 2050, Dubai Integrated Energy Strategy (DIES 2030), Dubai Demand Side Management Strategy 2030 (DSM 2030), UAE Energy Strategy 2050, and the UN Sustainable Development Goals. This ensures that we maintain synergy between our operations and local and global sustainability visions.

We have undertaken significant energy efficiency efforts across various businesses over the last decade. which has resulted in saving 369,801 tCO_2e emissions, and more than AED 196 mn, since 2014. To increase the efficiency and evaluate the success of our business units, we have implemented the Superior Energy Performance (SEP) scheme, encouraging our business units to improve their energy savings in accordance with their business potential.

Today, the UAE has become the first Gulf country to have committed to net zero emissions by 2050, with an expected investment of AED 600 billion for clean and renewable energy in the next three decades. To support this commitment, we continue to optimise our energy usage through continuous innovation and by leveraging advanced technologies. Since 2017, we have witnessed a nine-fold increase in the usage of solar PV across our operations, which resulted in savings of AED 3.2 mn per year. In 2020 alone, we used 15,726 GJ of solar energy, which was 9 times the amount used in 2018. Going forward, we plan to expand the number of our renewable energy-powered (RE-based) retail stations from 164 to 186 by the end of 2022.

> "Our dedicated teams form an important pillar and are integral to our achievements, and we strive to inspire their trust and motivate them to keep learning."

This year also saw us evolve our innovation journey with state-of-the-art offerings, such as ENOC NEXT, ENOC Beema, ENOC Pay and ENOC Link among others, which have further propelled our growth. We introduced an innovative petrol station with smart design and energy-efficient technologies and delivered a first-of-a-kind 'Service Station of the Future' at Expo 2020 Dubai, where we bagged the LEED Platinum Certification by US Green Building Council (USGBC). In addition, we offered an innovative digital fuel delivery service to the Expo's logistics fleet, through which we delivered more than one million litres of fuel to the Expo 2020 Dubai fleet. This is just the beginning as we move forward with several energy efficiency measures and become one of the companies that is leading energy transition in the UAE.

Our dedicated teams form an important pillar and are integral to our achievements, and we strive to inspire their trust and motivate them to keep learning. I am proud of the accomplishments we made in empowering our people and recognising their contributions. Their leadership and participation are important to the growth of the UAE's energy sector. As always, we continue to believe in creating new opportunities and solutions, and our efforts are substantiated by the ENOC Energy Scholarship and strategic partnerships with universities.

Through our purpose to build an energy-efficient world, we hope to inspire other institutions to join our efforts and help us realise this vision together.

H.E. Saif Humaid Al Falasi

Group Chief Executive Officer ENOC

Welcome to the **New World** of ENOC

Inside this section

- Shaping the New with Expo 2020
- Stepping into the New with a strong legacy
- Creating a significant impact in 5 years
- Innovating on the go for a New World

Shaping the New with Expo 2020

We are proud to be designated as the Official Integrated Energy Partner of Expo 2020 Dubai. Building upon the theme of 'Reimagine Energy', we have geared up with a state-of-the-art pavilion, future mobility station and an innovative digital fuel delivery service among other initiatives.

The theme for the Expo 2020 has been carefully derived through four distinctive narratives: Discover – what energy is; Harness – what energy enables; Connect– what energy needs; and Reimagine – what energy promises. The concept of 'Reimagine Energy' offers an engaging, multi-sensory experience for all ages, and is a tribute to the energy story as a human story, one that throughout history has changed the way we live and the way we think.

"We are dedicated to developing the nation's infrastructure to meet the energy needs of citizens and tourists. We will continue to assist the development of the city by extending our retail footprint to offer our clients the best-in-class services as we welcome guests for the world's largest show—Expo 2020 Dubai."

Zaid Alqufaidi
Managing Director – Retail

ENOC Pavilion

The pavilion has been constructed in line with the sustainability and design standards of Expo 2020, with a focus on integrating legacy into the layout. We adopted the best industry practices using local and recyclable materials and about 700 tonnes of steel. The pavilion is built to create an experiential ambience with the efficient energy consumption and a sustainable approach.

Service station of the future

We also unveiled the world's first LEED platinum certified Service Station of the Future, which showcased world-class excellence in the areas of energy savings, water efficiency and CO_2 emissions, and supported the logistical requirements of Expo 2020. The sustainable and architecturally unique station is inspired by our country's rich heritage and traditions. It is the first station in the region to incorporate an on-grid wind turbine for power generation and carbon fibre in the construction of its canopy. In addition, our digital signages consists of LED, and we have installed electric-vehicle chargers and multi-media interactive advanced dispensers.

Read more on Page 48

ENOC Link

Our futuristic mobility solution uses the latest technology to offer a safe, streamlined, and seamless process for refuelling. We offered an innovative digital fuel delivery service to the Expo's logistics fleet. Our key product offerings included diesel, biodiesel B5 and B20, and petrol, provided by fuel trucks that are compliant with the highest international safety standards. They delivered more than one million litres of fuel to the Expo 2020 Dubai fleet.

Read more on Page 46

ENOC Pavilion

Service station of the future

ENOC Link

Stepping into the **New** with a strong legacy

"In line with its endeavour to create long-term value, ENOC has set a precedent with the integration of E&RM into its daily operations and responsible business practices.

At ENOC, we are cognisant that the UAE is the first Gulf country that has committed to net zero emissions by 2050, with an expected investment of AED 600 billion for clean and renewable energy in the next three decades.

We are geared to contribute to this vision with concerted efforts towards reducing our carbon footprint across our businesses and value chain. Today, we are proud to be the only company worldwide to have conceptualised and installed a futuristic service station at Expo 2020 Dubai. This avante garde station was powered by renewable energy (wind and solar), and energy efficient materials."

Eng. Alia Busamra,
Chief Sustainability Officer

A sustained legacy in energy efficiency

ENOC's growth story is more than four-and-a-half decades old. We began our business journey as a local oil and gas company. Subsequently, ENOC metamorphosed into a global operator across a spectrum of operations in the energy value chain.

Through the years, responsibility, reliability and innovation have been the cornerstones of our business operations, which have powered the UAE's phenomenal growth and development.

We have always focused on superior energy performance, driving investments in innovation and technology. We have been equally committed to environmental stewardship, becoming a sustainability leader for the industry in the region. Our efforts are always directed towards exceeding stakeholder expectations and setting newer benchmarks in the clean energy space.

2008-2013
Embedding E&RM Priorities in our Business Operations

2008
- Conceptualisation of E&RM policy and system manual
- Development of draft E&RM policy and system manual

2009
- Circulating the draft E&RM policy and system manual to all ENOC
- BUs for consultation in June
- Conducting trial audit
- Issuance of the first International
- Standard BS EN 16001 in July

2010
- Approval of ENOC E&RM Policy and draft manual
- Commencement of audits
- Development of corrective action plans

2011
- Expansion of audit scope
- Introduction of ISO 50001 Standard

2012
- Setting up ENOC's E&RM
- Steering and Technical Committees
- Conducting ISO 50001 training

2013
- Implementation of revised benchmark of E&RM audit score target and inclusion of E&RM audit score and BPs in Balance Score Cards
- Conducting Energy Institute trainings
- ELOMP's ISO 50001 certification

2014-2018
Shaping the Future for Growth

2014
- Introduction of new KPIs
- Verification and monitoring of BPs saving and E&RMS
- Conducting Energy Audits
- Alignment of E&RMS audits with ISO 50001

2015
- Revised ENOC E&RMS Manual in line with ISO 50001
- Monitoring, verification and consolidation of E&RM BPs

2016
- Introduction of a cultural transformation from compliance to superior energy performance
- Introduction of self-audit for best performing BUs
- Full ownership of the audit results and corrective

2017
- Applying a 3% savings target through E&RM
- Conducting training programmes on self-audits for the BUs
- Introduction of ENOC's
- Superior Energy
- Performance Scheme
- Introduction of 'Purchase and Design Efficiency Standard', which set minimum efficiency requirements for all new designs and equipment, including new projects and retrofits

2018
- Pursuit of ISO 50001 – Energy Management System Certification for all ENOC BUs
- ENOC Superior Energy
- Performance (SEP) scheme launched for all BUs and rated
- Identification of E&RM improvement projects in Dragon Oil projects in Dragon Oil

2019 onwards
Charting New Milestones in the Energy Journey

- Inclusion of E&RM and sustainability considerations in ENOC's Stage-Gate process
- Launch of ENOC Green Drive Initiative under Carbon Ambassador Program
- Focus on Energy sub metering in BUs to improve energy monitoring and analysis
- Introduction of Energy Fund for energy optimisation projects within the Group and funding of projects with high potential
- Increased total Group product delivery and sales in volume but due to the energy optimisation projects and sustainability measures taken, the energy intensity remains stable
- More than 396,801 tCO_2 avoided due to E&RM projects since 2014
- 5 specific KPIs focusing on E&RM in ENOC Sustainability Index

AED 196 mn
CUMULATIVE SAVINGS SINCE 2014

AED 58.33 mn
TOTAL E&RM SAVINGS ACHIEVED FROM 2017-2021

3.5%
ANNUAL ENERGY DEMAND REDUCTION TARGET

Creating a significant impact in 5 years

For well over a decade, ENOC has shown that a successful E&RM program not only makes environmental sense but also sound economic sense. In 2021, our E&RM projects led to a saving of AED 8.2 mn, and a cumulative saving of AED 196 mn across the Group over the last five years. The achievement highlights the significant progress we have made in applying innovation and well-thought-out E&RM strategies across our operations that have made the Group a sustainability champion for the entire region.

We are focusing on utilising renewable energy sources that will help reduce our dependence on fossil fuel-generated electricity and minimise our environmental impact. We have installed a total 2.82 MW renewable energy capacity across our businesses through solar energy. In 2020, we utilised 15,726 GJ energy from solar power, which was 9x the usage of solar PV compared to 2018, leading to a saving of AED 3 mn per year.

As we move towards being a clean energy partner of the nation, we will continue to utilise innovative sustainable solutions and create a culture of efficient and rational energy use within the organisation.

We have created a significant impact in the following areas:

- Reduced energy intensity
- Integrated clean energy in operations
- Rewarding business units and employees with energy awards
- Encourage energy efficiency throughout the business
- Train employees in energy efficiency
- Stepping up on green procurement
- Embedding digitalisation across operations

Reducing energy intensity within the organisation

We recognise the climate-related risks associated with our business activities especially with the refining business, which accounts for more than 75% of the Group's energy consumption.

We are committed to optimising our energy use and thereby reducing our carbon footprint in accordance with our E&RM system that has evolved since 2008. Our E&RM policy was drafted in 2010 and aligned to ISO 50001:2011 Energy Management System standards. All our businesses are certified to ISO 50001. We are aligned with the Paris Agreement, the UAE Vision 2021 and the UAE Energy Plan 2050 to reduce our carbon footprint.

As part of our E&RM system, business units (BUs) are required to identify and implement new energy saving opportunities and report on their achievements on a quarterly basis. The targeted savings to be achieved against the Energy Business Plan (BP) KPIs are submitted at the beginning of the year. We have developed standardised templates which makes it easy for the BUs to report their progress, which also enables us to capture high quality data. The Group Sustainability Department (GSD) reviews these quarterly reports and gives feedback to the BUs against their performance. The Group also undertakes energy optimisation studies when a BU arrives at the conclusion that it has maximised its potential savings from E&RM and can no longer identify further areas of improvement. The GSD, in consonance with the BUs, conducts extensive studies and analysis to identify cost reduction.

AED 8.2 mn
SAVED FROM ENERGY & RESOURCE MANAGEMENT IN 2021

193,000 MWh
POWER SAVINGS SINCE 2014

-24.1%
REDUCTION IN ENERGY INTENSITY SINCE 2014

20
ENVIRONMENTAL AND ENERGY AUDITS CONDUCTED IN THE PAST FIVE YEARS

7
OPTIMISATION STUDIES CARRIED OUT IN 2020 THAT IDENTIFIED POTENTIAL

E&RM KPIs

ENOC has made every effort to ensure that Energy and Resource Management (E&RM) initiatives are supported by SMART (Specific, Measurable, Achievable, Realistic, and Timely) targets developed and represented within ENOC's Sustainability Index. The index consists of E&RM specific KPIs and helps the organisation evaluate how operations can be made more efficient taking into consideration energy consumption and carbon emissions into all business decisions.

No.	Description of KPI	Measurement unit	2021 Target	Index Score	SDG Contribution
	Energy efficiency KPIs				
	Thermal energy consumption per unit	GJ/ton	-1.1%	1	SDG 7
	Electrical energy consumption per unit	kWh/ton <	-1.1%	1	SDG 7
	Energy demand reduction from baseline 2013	% (>)	3.5%	1	SDG 7
	Renewable energy generation	% (kWh/kWhtotal)	0.2%	1	SDG 7
	GHG emission per unit reduction	tCO_2e/ton or tCO_2e/m^2	-1.1%	1	SDG 7 and 13
	Air emissions (SOx, NOx, PM, CO) above legal limit	number of source above limit	0	1	SDG 3 and 9
	Recycled water usage compared with total water consumption	% Water reuse	7.5%[a]	1	SDG 6
	Waste reduced/recycled compared with baseline	% Waste recycle	30%*	1	SDG 12
	Flare gas reduction compared with the baseline	% Flare reduction	5%	1	SDG 13
	Amount of green procurement vs. Total procurement	% Green procurement (AED/Total AED)	90%	1	SDG 7 and 13

[a] Retail recycled water usage Target : 45% Waste recycled/diversion Target : 17.5%
* If reduction of water or waste then 5% y-o-y

Reducing energy intensity within the organisation

Performance Dashboard

Energy consumption

ENOC Group Energy Consumption	2014	2015	2016	2017	2018	2019	2020	2021
Total Direct Energy Consumption (GJ) - Thermal	23,111,056	24,489,938	22,185,067	23,044,832	20,602,793	20,233,993	21,481,800	24,851,712
Total indirect energy consumption (GJ) - Grid electricity	467,242	443,305	487,195	457,787	432,187	656,269	680,644	640,790
Total renewable energy consumption (GJ) - Renewable	-	-	-	485	1,744	9,573	15,714	24,015
Total energy consumption (GJ), including CRE	23,634,569	25,015,294	22,760,127	23,563,847	21,065,153	20,924,690	22,204,077	25,550,469
Dragon Oil total energy consmption (GJ)	2,179,045	2,320,926	2,105,093	1,967,895	2,152,383	1,985,837	1,864,585	1,668,995
Energy Consumption	-	-	-	-	-	-	-	-
Segment total (Thermal + Grid + Renewable), GJ/ton								
Retail	0.138	0.136	0.132	0.131	0.133	0.132	0.167	0.156
CIS	0.030	0.027	0.026	0.024	0.023	0.023	0.029	0.026
Terminals	0.009	0.009	0.009	0.007	0.008	0.007	0.007	0.007
STP	3.652	3.673	3.968	3.542	3.713	3.550	4.305	3.956
ENOC Grand Total	**0.673**	**0.617**	**0.539**	**0.490**	**0.454**	**0.398**	**0.507**	**0.511**
Thermal, GJ/ton								
Retail	0.001	0.002	0.003	0.004	0.003	0.003	0.004	0.004
CIS	0.015	0.014	0.014	0.015	0.016	0.015	0.018	0.016
Terminals	0.006	0.006	0.005	0.004	0.004	0.004	0.004	0.005
STP	3.638	3.667	3.957	3.534	3.713	3.510	4.248	3.916
ENOC Thermal	**0.658**	**0.604**	**0.526**	**0.479**	**0.444**	**0.385**	**0.491**	**0.497**
Grid, GJ/ton								
Retail	0.137	0.133	0.129	0.127	0.130	0.125	0.156	0.141
CIS	0.015	0.013	0.012	0.009	0.007	0.007	0.009	0.009
Terminals	0.004	0.003	0.003	0.003	0.003	0.002	0.002	0.002
STP	0.014	0.006	0.011	0.008	0.000	0.040	0.057	0.039
ENOC Grid	**0.013**	**0.011**	**0.012**	**0.010**	**0.009**	**0.012**	**0.016**	**0.013**
Renewable, GJ/ton								
Retail	0.0000	0.0000	0.0000	0.0002	0.0005	0.0035	0.0067	0.0100
CIS	0.0000	0.0000	0.0000	0.0000	0.0001	0.0002	0.0003	0.0003
Terminals	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
STP	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0004	0.0003
ENOC Renewable	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0002**	**0.0004**	**0.0005**

STP - Supply Trading & Processing

Energy intensity

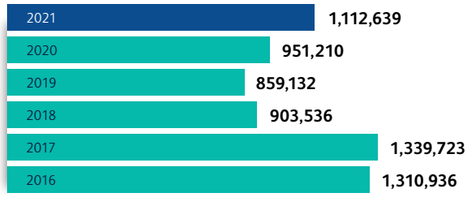
ENOC Group specific energy consumption
(IN GJ/BOPD)

Dragon Oil energy intensity
(IN GJ/BOPD)

GHG emissions

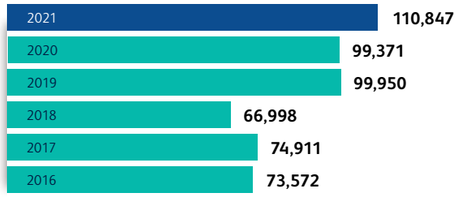
Scope 1 emissions

GHG emission (CO_2e) for the ENOC Group
(tCO_2e)



Scope 2 emissions

Indirect GHG Emissions for the ENOC Group and Segments
(tCO_2e)



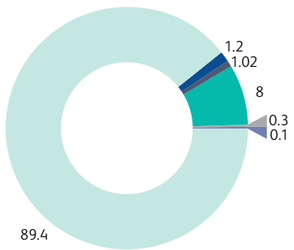
GHG emissions intensity

GHG Emissions intensity for the ENOC Group and Segments (kg CO_2e/ tonne production)	2014	2015	2016	2017	2018	2019	2020	2021
ENOC Group	28.84	26.00	23.77	21.07	20.94	18.25	24.03	24.39
Retail	19.83	19.43	18.85	18.63	18.95	18.30	22.81	16.16
CIS	3.2	2.9	2.8	2.4	2.2	2.2	1.9	1.5
Terminals	0.95	0.92	0.91	0.8	0.8	0.7	0.7	0.6
STP (EPCL & DUGAS)	148.4	146.1	164.3	144.0	161.5	153.4	195.0	178.8
Dragon Oil*	17.07	19.86	24.51	20.75	29.59	29.84	36.22	24.49

* kgCO2/BOPD

Energy consumption breakup by business

Total energy consumption
(%)



STP	89.4
Retail	1.2
Terminals	1.02
Dragon Oil	8
Marketing	0.3
Corporate Real Estate	0.1

Integrating clean energy in ENOC's operations

We are aligned with the UAE Energy Strategy 2050 and Dubai Clean Energy Strategy 2050. To track our progress against these objectives, and encourage faster adoption of clean energy, ENOC's Sustainability Index includes KPIs such as 'Renewable energy generation against consumption' and 'Carbon intensity reduction'. We exceeded our RE generation target this year, registering an increase of 0.56% against a set target of 0.1%.

ENOC Group was awarded the coveted 2020 Energy Management Insight Award by Clean Energy Ministerial, a global forum of 25 countries and the European Commission. We were recognised for the implementation of ISO 50001, a global standard that makes it easier for organisations to integrate energy management into their overall efforts to improve quality and environmental management. Our energy management system has always been forward-looking, and we have been aligned to ISO 50001 since 2011, following which we have introduced new KPIs and targets across our business operations. Our Superior Energy Performance (SEP) Scheme takes our Energy and Management System (E&RM) beyond compliance, enabling us to set competitive standards within the organisation, whereby each business unit can compare its own energy performance against that of others. The best performing business unit (BU) wins the ENOC Energy Award.

Renewable energy consumption

Solar Power (GJ) generated	2017	2018	2019	2020	2021
Retail	473	1,155	8,629	12,678	21,052
CIS	13	511	818	822	841
Terminals	-	78	126	120	233
STP	-	-	-	2,093	1,889
Corporate Real Estate	-	-	2	12	15
Total	**486**	**1,744**	**9,575**	**15,725**	**24,030**

ENOC's Dubai Lubricants Processing Plant-Jebel Ali operating on 100% renewable energy

We evaluate the success of our BUs in implementing our superior E&RM practices through the Superior Energy Performance (SEP) scheme. Once again, a start performer this year was ENOC's Dubai Lubricants Processing Plant-Jebel Ali (DLPP) team, which won the 'Renewable energy pioneer of the year' award at the 2021 ENOC Energy Awards for the third time in a row for installing solar roof-top PVs capable of meeting 100% of their electrical energy consumption.

Before the installation of the new system, DLPP was consuming electricity from the grid, mainly for air-conditioning in the office space and operations of its blending systems, pumps, air compressors and quality control laboratory at the plant.

The high energy consumption and dependence on grid electricity prompted it to explore other alternatives.

DLPP installed a 108 MW solar PV system on site while retaining its existing connection to the grid. The RE system can generate enough electricity to meet the energy needs of the facility, including that needed to run all plant operations. Additionally, as the solar PV system is connected to the grid through bi-directional meters, there is no risk of a shortfall in power supply for plant operations during cloudy days.

Case Study

Rooftop solar systems for Retail

One of our recent initiatives has been the growth plan of the Retail network in the Emirate of Dubai. The use of renewable energy forms a major part of this initiative and installation of rooftop solar system is integral to this drive. In 2020, we conducted competitive tendering, taking into consideration DEWA's Shams Dubai initiative to connect install 1,354 photovoltaic installations on residential, commercial and industrial buildings in Dubai totalling 125 MW of power. This is its first smart initiative to connect solar energy to buildings as a part of its Distributed Renewable Resources Generation programme. We awarded contractors to install rooftop solar panels in 19 fuel stations with attractive average Internal Rate of Return (IRR), which is 24% per site. This investment will result in freeing the cash flow from energy consumption and reduce the carbon footprint of our service stations.

157,000kWh
SOLAR POWER PRODUCED IN 2021

75 tCO_2
EMISSIONS AVOIDED PER YEAR

AED 65,000
ANNUAL COST SAVINGS

The system has been in operation for four years now and DLPP JA has successfully run its 100% of its operations on solar power for the whole year

Dugas Solar Power Plant

Being a responsible organisation, we are on the path to embedding and enhancing sustainability practices across our operations. At DUGAS, we are committed to minimising our natural gas consumption and overall carbon emissions by increasing our adoption of renewable energy.

We have established a solar hybrid electricity supply system in 2019, which is connected to our internal electricity distribution system with a capacity of 124 kWp. This unit is connected to our MCC 8 grid and is responsible for powering the Administration Building, Engineering Building, Mechanical & Electrical Workshop, as well as some of our offices. With this integration of solar energy to our electricity grid, we have effectively reduced our carbon emissions.

178,930 kWh
OF SOLAR ENERGY CONTRIBUTED TO INTERNAL GRID

69 tonnes CO_2
EMISSIONS AVOIDED/PER YEAR

~ AED 100,000
ANNUAL COST SAVINGS

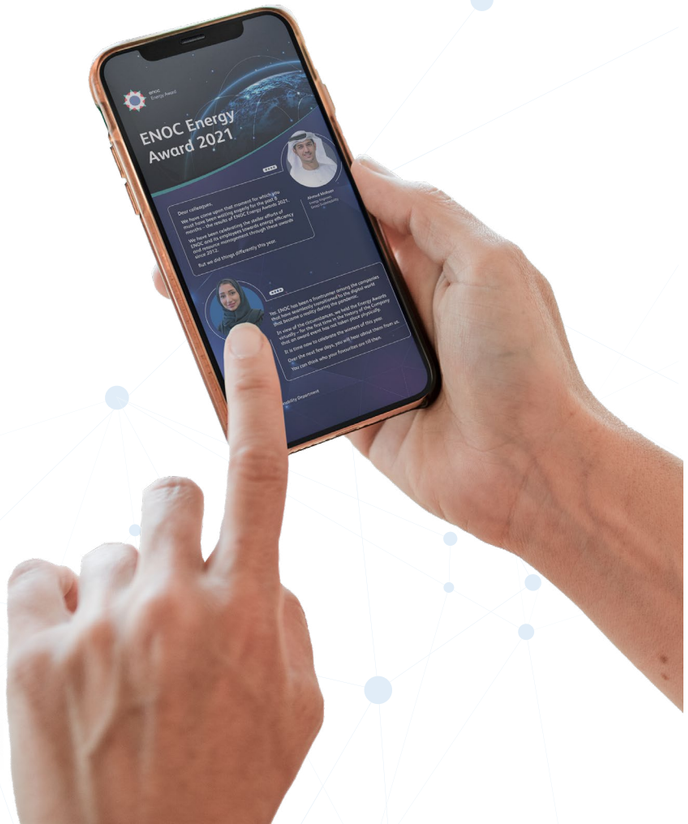
ENOC energy awards

Since 2012, the ENOC Energy Awards have been rewarding the stellar efforts of ENOC business units and employees towards E&RM and celebrating their winning ideas and innovations that will go a long way in realising the Group's sustainability vision. These rewards and recognition have elevated our E&RM drive above compliance and made it a part of everyday conduct at ENOC. In 2020, ENOC held the first ever virtual ENOC Energy Awards considering the pandemic restrictions.

The awards today include categories that boost performance in areas that are seen to have potential in energy saving, while promoting innovation and investment in renewable energy. Apart from generating a spirit of healthy competition among our BUs, it has helped us integrate our diverse teams from different nationalities and orient them towards the common mission of energy efficiency and constant innovation.

The 9th annual ENOC Energy Award ceremony was held on September 30, 2020 to recognise the most resourceful, pioneering, and transformative contributions in the field of energy efficiency and resource conservation by BUs or individuals in the organisation during 2020. The evaluation team comprised Eng. Alia Ali Busamra, Chief Sustainability Officer, Head of Group Sustainability, Saravanan D. Pandian, former Senior Sustainability Specialist, and Eng. Ahmed Mohsen, Energy Engineer. The event appreciated the efforts of our 'hidden soldiers' within our operations during the pandemic. Our heroes showed great agility in quickly adapting to the new normal and pushed ahead with their energy efficiency drive despite the pandemic situation.

enoc
Energy Award



Results of 2020 and 2021
ENOC Energy Award

Business awards

Category A
Highest investment in energy saving projects
– Corporate Real Estate

Category B
Green procurement champion of the year
– Retail

Category C
Highest energy and resource cost reduction achieved from 2013 (baseline)
– Corporate Real Estate

Category D
Best Energy and Resource Management Business Plan for the year
– ENOC Processing Company (EPCL)

Category E
Highest employee involvement to promote energy and resource management
– Horizon Terminals (HTL Distribution)

Category F
Renewable energy pioneer of the year
– Dubai Lubricants Processing Plant Jebel Ali (DLPP)

Category G
Energy star of the year – leader in energy intensity reduction
– HSTPL (Horizon Terminals)

Category H
Best energy and resource initiative for the year
– Dubai Natural Gas Company Limited (DUGAS)

Category I
Best business unit of the year in energy and resource management
– Dubai Natural Gas Company Limited (DUGAS)

Individual employee awards

Category J
The most engaged Manager who showed real leadership towards implementation
– Mr. Hamad Mohamed Ali
Sr. Director, Gas & MTBE Operations, DUGAS

Category K
The most active ENOC E&RM Technical Committee Member
– Ms. Charmaine Mendez
HSE Officer, Retail

Category L
The most active Technician/ Engineer involved in E&RM
– Mr. Lijo Koshy
Technical Trainer, Tasjeel

Superior energy performance scheme to encourage energy efficiency

Since 2017, the Superior Energy Performance Scheme of the Group has also been encouraging BUs to continuously enhance their operational efficiency and go green in their operations.

SEP encourages our BUs to strive improve their energy saving targets consistently in accordance with their business potential. The scheme is aligned to the US Department of Energy Advanced Manufacturing Program and provides guidance, tools and protocols to drive energy savings in alignment with the ISO 50001: 2011 Energy Management System. We also encourage our employees to be innovative and submit ideas aimed at improving efficiency and increasing savings.

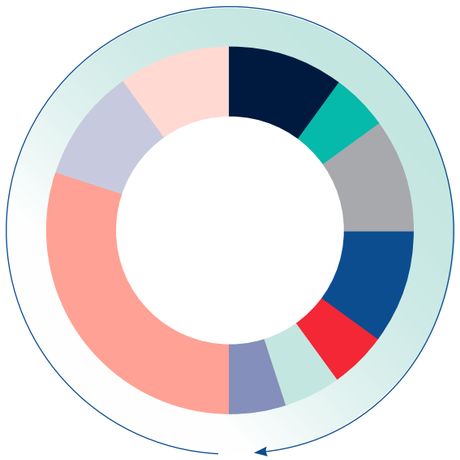
The SEP Scheme manual lays down 10 minimum management system requirements for a BU to quality for SEP certification. The intention is not only to reward and recognise BU efforts, but also to systematise its E&RM efforts through better planning, training, monitoring and measurement. Our E&RM efforts are aligned against our SMART – Specific, Measurable, Achievable, Realistic, and Timely – targets, which also forms the guardrails for BU action in E&RM.

The SEP scheme has 7 Enablers and 3 Results criteria to measure the level of superior energy performance. The Enablers measure the environment created by the BU to promote E&RM within its operations and the 3 Results criteria measure the outcome achieved as a result.

SEP scheme criteria for award ranking

Enablers (%)

Benchmarking	10
Metering	5
Investment in projects	10
Training	10
Green porcurement	5
Research and development	5
Employee suggestions	5
Energy savings (as% of baseline)	30



Total 100%

Results (%)

Renewable energy (% of total energy use)	10
Number of new innovative projects	10

Awards and recipients

	★	★★	★★★	★★★★	★★★★★
Award Categories	CERTIFIED	BRONZE	SILVER	GOLD	PLATINUM
Award recipients of 2020 SEP	ELOMP – F	Emirates Gas & CRE	DLPP - JA & Retail	-	-

Elomp-F

DLPP

Emirates Gas

Retail

Energy efficiency training

Training of employees is critical to the success of our E&RM strategy. We have identified the opportunities to build the capacity and competencies of our employees so that they can push our overall strategy to manage our resources more efficiently. Our training programme also gives opportunity to the employee to earn certification.

Energy efficiency training

We began training our employees intensively following introduction of the Dubai Supreme Council of Energy's (DSCE) mandates in 2011. Following the initial rounds of training, ENOC's Competency Development Framework 2012 was established to build capacity for ENOC employees across eight competencies.

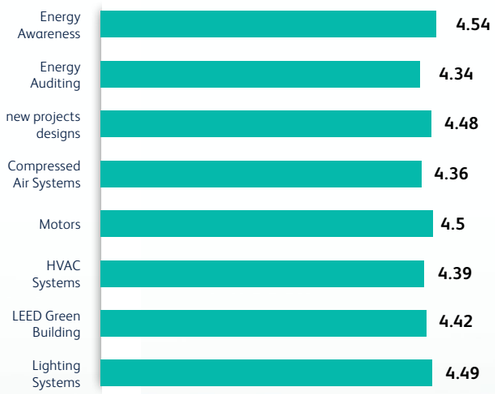
In order to build a talent pool of people for enhancing our energy efficiency practices, we conduct trainings on varied topics across our BUs. Key topics for the trainings include energy auditing methodology, new projects and engineering design, compressed air systems, motors, HVAS systems, LEED Green Building ratings, lighting systems, conservation in boilers/heaters, conservation approach for the equipment-pumps.

Turning the crisis caused by COVID-19 in 2020 into an opportunity, we introduced virtual trainings for the first time via Microsoft Teams. Around 880+ hours of training were delivered by the Energy and 700+ hours on Environment, with over 31 sessions.

Feedback on energy trainings conducted

Energy & Resource Management Trainings feedback

(IN GJ/BOPD)

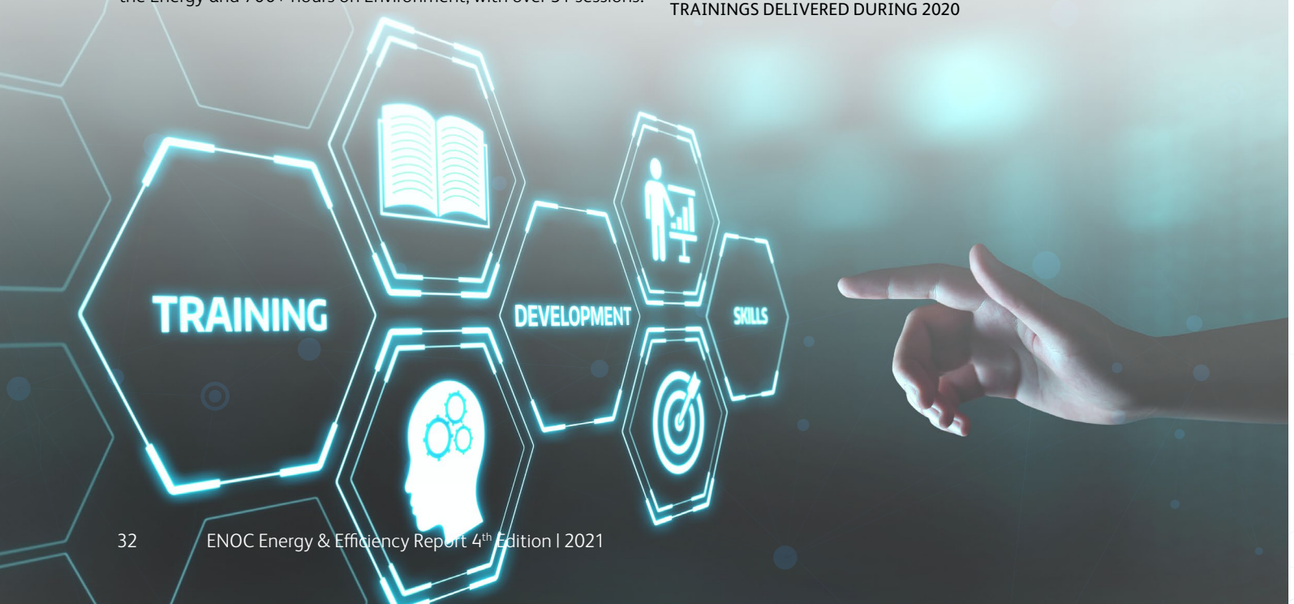


What was unique about the trainings in 2020

- First time virtual trainings introduced via Microsoft Teams
- Ability to reach to a wider audience including overseas employees
- Helped avoid carbon emissions from business travel

$ 93,386

TOTAL SAVINGS PER HOUR OF ENERGY EFFICIENCY TRAININGS DELIVERED DURING 2020



Trend in green procurement

We consider it our responsibility to find, source and acquire goods and services that are sustainable and come with the minimum social and environmental cost. As part of our green procurement mission, we assess goods based on their energy efficiency, water-use efficiency, and other environmental impact. A dedicated team looks into our green procurement practices, which are backed by the Green Public Procurement (GPP) policy. A Green Procurement Officer advises us on all aspects of green purchasing.

Our efforts at sustainable procurement are aligned with ASHRAE Standard 90.1-2013, Energy Star rating and LEED (v4), which supplement our own Purchase and Design Energy Efficiency Standards (GPP Standard). These practices not only help us save costs but also help avoid supply risks while decarbonising our footprint across the supply chain..

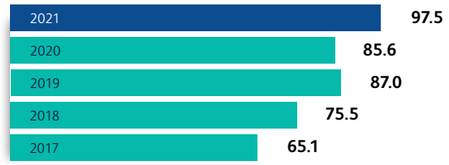
Green Procurement Programme

Our Green Procurement Programme achieved a greater penetration for the addressable categories of spend (i.e. HVAC, Lights, Electric Motors etc.) on the back of several initiatives:

- **Building capacities:** We conduct four training sessions for end-users from different segments to help them understand our Green Procurement objectives, scope, process and benefits and how to effectively implement the energy efficiency standard for business purchasing decisions
- **By ensuring that Green Procurement is a solid KPI** and part of the balanced score card of all ENOC BUs
- **ENOC Energy Awards:** The awards celebrate BUs with the best green procurement initiatives and outcomes

Green Procurement in ENOC

(% OF TOTAL PROCUREMENT)



Green procurement is increasing year on year due to increasing awareness and also adoption of best practices and standards by the Group such as the Purchase and Design Energy Efficiency Standard that all BUs are expected to follow when procuring energy equipment or units.

In 2021, green procurement purchases accounted for 100% of our total procurement, surpassing our target of 80%. All tenders raised during the year for product categories such as lights, Heating Ventilation and Cooling (HVAC), commercial pumps, electric motors, refrigerator equipment, water fixtures, and electric vehicles went through a green procurement assessment.

During 2021, we registered 1,300 vendors after a thorough screening process conducted by Business Ethics Committee (BEC) for due diligence and compliance risks. We also ensure that registered vendors accept the ENOC Supplier Code of Conduct as a compliance condition to participate in ENOC sourcing/ tendering activities. As part of Corporate Governance, we clearly define the values and standards in dealing with third parties, particularly with respect to our suppliers, to maintain the highest ethical standards, including the Environmental, Social and Governance parameters.

Enduring digitalisation for best output

Digitalisation has become integral to our business operations and our internal processes. Automation is also becoming increasingly critical in achieving operational efficiency through faster data monitoring and problem solving.

For some of our businesses, digitalisation aids in reducing downtime and increasing production output. To accomplish a digitised approach, smart technologies, artificial intelligence, advanced imaging technology and data-gathering sensors are being employed.

We also introduced Masar, an innovative digital transformation programme designed to offer complete digital integration of all our divisions to enhance efficiencies across the Group's core operational and support functions.

Transforming internal operations with Masar

Over the past few years, we have focused on investing in technology solutions to further enhance internal operations and accelerate innovation. With Masar project ENOC took to enhance its digital infrastructure with an investment of AED 250 mn. ENOC is currently embarking on a major transformation journey by implementing SAP S/4HANA ERP across its entire operations.

Inception

In 2019, we introduced 'Masar', an innovative digital transformation programme designed to offer complete digital integration of all our business divisions to enhance efficiencies across all core operational and support functions. The programme unifies operations and deploys highly competitive business best practices, which is the foundation to achieve digital excellence as "One ENOC".

Implementation

Through implementing Masar, we plan to enable a complete transformation of our internal operations over three stages; the first stage is focused on business alignment with the overall programme objectives, the second is the SAP deployment in 33 ENOC companies across 4 countries and the third is focused on our four Retail segments. More than 400 members were involved in Masar from ENOC and we also had five participating partners who delivered exceptional value in the programme.

Masar provides an intuitive platform for all business activities offering a new age millennial user experience. All our entities are now centrally connected to the platform for business planning and budgeting.

For example, our supply chain has become digitally connected, with the entire contract management lifecycle being digitalised for all segments. Integration of Masar with external systems has helped in eliminating manual tasks, therefore providing more accurate results. This has enabled both procurement and HR to function with end-to-end automation which has significantly facilitated internal procedures and enhanced employees' experience. On the customers' end, Masar has enabled sales force automation, a fully digitised customer engagement experience, leading to an improved line level profitability. Through its implementation, reporting and analytics can now be generated on a real time basis which has made information easier to access at all times. The third and final stage of the Masar programme is focused on streamlining all retail businesses for an exceptional customer experience. By the end of stage 3, we will have a fully automated and synchronised process across its retail functions which will support seamless backend processes and provide an enhanced customer service.

Outcome

Integrating SAP in our business operations has allowed us to offer exceptional value to our customers and stakeholders which supports our vision in promoting innovation, strengthening the digital infrastructure and embracing technologies. SAP S/4HANA enables the Group to outperform efficiently and elevate its sustainability standards as per the industry best practices by becoming more agile and more responsive to the environmental requirements and adapt to the ever-changing technology landscape.

Employee Training on digitalisation

Harnessing talent to attain digital transformation is our greatest priority. Capability building and upskilling of employees are imperative to the ramping up of the digital drive. In FY21, the digital transformation training, which was delivered virtually, covered 249 participants. The introductory awareness session on digital transformation saw the highest attendance of 74%. The Group Sustainability and Environment Department was able to deliver 21.5 hours of virtual training in 2021.

Digitalisation training sessions conducted in 2021

- Digital Transformation Awareness Session
- Industrial Revolution 4.0 Session
- Digital Transformation Concept in 21st Century
- Digital Transformation Strategy: Shaping the Future of the SSC, GHR and NBD Segment
- Concept of Paperless Office and Dubai Government's Paperless Strategy
- Digital Transformation Maturity Model and Status Evaluation of the Segment
- Digital Transformation KPIs' Templates and Reporting

Embracing the new with responsible governance

Since the time we conceptualised the Energy & Resource Management (E&RM) Steering and Technical Committees in 2012, they have played a pivotal role in building energy efficiency and streamlining our day-to-day operations. The establishment of these two committees has allowed us to identify opportunities for savings and enhanced the overall energy and resource management.

The E&RM initiatives of the Company are also supported by the ENOC Carbon Abatement/Climate Change Technical Taskforce and ENOC Fuel Efficiency Technical Taskforce. They also provide insights on the progress achieved in meeting emission targets, fuel efficiency and resource management practices. These committees also serve as a platform for interaction between a wide group of stakeholders on various aspects, such as knowledge sharing, guidance and thought leadership.

ENOC E&RM Steering Committee

The E&RM Steering Committee's core purpose is to develop a long-term plan to ensure that the Group's sustainable and efficient energy management practices operate in alignment with the strategies of Dubai Supreme Council of Energy (DSCE) and other international agencies. This committee, which meets on a quarterly basis, includes ENOC BU heads who are responsible for the implementation of E&RM within their everyday operations. The committee is also responsible for ensuring that ENOC stays ahead of the curve with respect to the implementation of any updated federal and local directives, mandates and strategies and ensures that all BUs are playing a part in the achievement of these targets.

ENOC E&RM Technical Committee

The E&RM Technical Committee is charged with operationalising the E&RM strategy by establishing and monitoring KPIs. Further, it provides insights into the enhancement of E&RM competencies at every operational level. A source of knowledge and expertise, carefully shaped through the dedication of key technical BU members, this committee supports the development, review and endorsement of technical standards and projects related to E&RM. The committee ensures that all of ENOC's projects are in alignment with the requirements of the DSCE as well as other relevant local, national and global mandates.

ENOC Carbon Abatement/ Climate Change Technical Taskforce

Our Carbon Abatement/Climate Change Technical Taskforce advises the Sustainability Leadership Committee on the Group's progress with respect to its emission targets and GHG reduction. The taskforce is also responsible for the development and implementation of policies related to mitigating climate change and ensuring they are aligned with the UAE government strategies as well as those of the DSCE and its carbon abatement strategy. The taskforce conducts an impact analysis of climate change policies, legislation and local and national mandates and provides recommendations in line with ENOC's business goals.

ENOC Fuel Efficiency Technical Taskforce

The ENOC Fuel Efficiency Technical Taskforce is part of the ENOC Energy and Resource Management Technical Committee, and focuses on fuel efficiency and quality, trial of additives, measurements of emissions, and related matters. Their primary role is main to advise the Energy and Resource Management Technical Committee on fuel efficiency and resource management practices. This involves monitoring of initiatives directly related to fuel additives and advising on their feasibility and importance, while identifying how they can be implemented within the Group. The committee is also involved in collecting and submitting information from BUs to the Group Sustainability Department.

Group Sustainability Department

ENOC's Group Sustainability Department (GSD) was established in 2016 and tasked with managing the performance of three key focus areas: environment, energy and sustainability. The year 2017 saw the addition of Corporate Social Responsibility (CSR) to these responsibilities to further the reach and impact of the GS. As an advisor to the technical and steering committees, the GSD provides professional services and technical expertise to the Group members and BUs across various topics with a focus on E&RM. The role of the department has transformed from being a compliance assurance team to providing guidance as subject matter experts and training. The department has played a major role in increasing awareness and compliance with respect to E&RM among employees and key stakeholders. This is reflected in the achievements and recognition received by the GSD and BUs over time.

Actioning for a better world, together

ENOC operates in a dynamic environment which is governed by a significant amount of thrust on servicing the sustainability development agenda. Through our business operations, we are transforming energy to be more efficient and sustainable, while minimising our impact on the environment.

UAE was the first middle east country to formally endorse and conform with the United Nations Sustainable Development Goals. In alignment with UAE's vision, ENOC undertook efforts in actively aligning with the SDGs with an objective to create meaningful impact. We found that the most relevant goals to our E&RM initiatives were SDG 7 and SDG 12.

It is our mission to bring integrated energy solutions, (i.e., a mix of conventional and alternative fuel) to all, making energy easy, affordable and sustainable. ENOC is leading the transition to sustainable energy with its state-of-the-art and energy efficient offerings such as ENOC Link, new age service stations, installation of renewable energy across its refinery and retail stations. We also directly contribute to SDG 12 through our unwavering focus on ensuring energy efficiency across our operations, with high impetus laid on digitalisation and framing policies, which directly/indirectly improve resource efficiency.

While identifying and aligning our supply chain to the SDGs, we analysed the following:

- The positive/negative impacts ENOC have on SDGs
- Level of control ENOC has on the SDGs to positively contribute to sustainable development

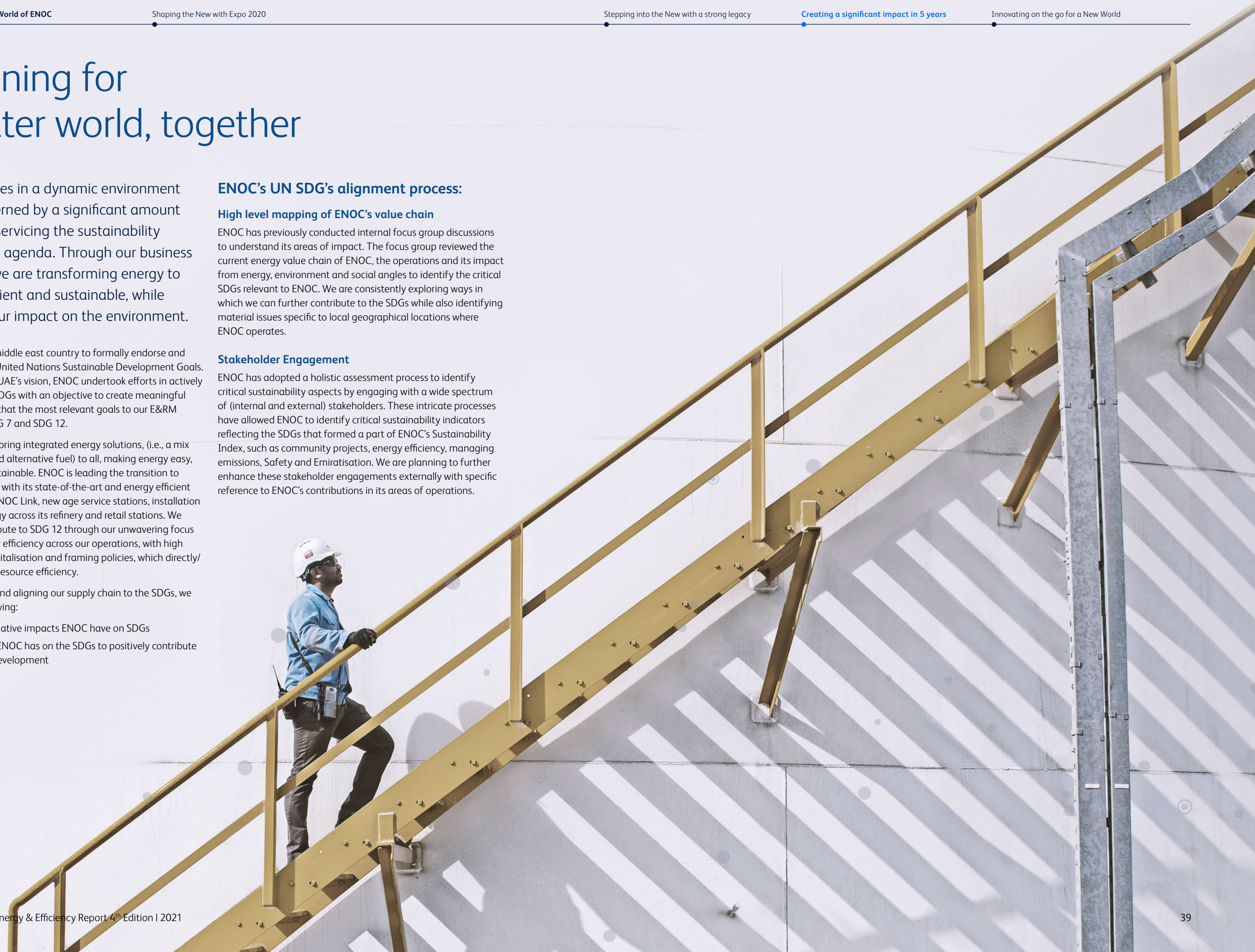
ENOC's UN SDG's alignment process:

High level mapping of ENOC's value chain

ENOC has previously conducted internal focus group discussions to understand its areas of impact. The focus group reviewed the current energy value chain of ENOC, the operations and its impact from energy, environment and social angles to identify the critical SDGs relevant to ENOC. We are consistently exploring ways in which we can further contribute to the SDGs while also identifying material issues specific to local geographical locations where ENOC operates.

Stakeholder Engagement

ENOC has adopted a holistic assessment process to identify critical sustainability aspects by engaging with a wide spectrum of (internal and external) stakeholders. These intricate processes have allowed ENOC to identify critical sustainability indicators reflecting the SDGs that formed a part of ENOC's Sustainability Index, such as community projects, energy efficiency, managing emissions, Safety and Emiratisation. We are planning to further enhance these stakeholder engagements externally with specific reference to ENOC's contributions in its areas of operations.



Actioning for a better world, together

Selection of indicators and data collection methodology

The ENOC Sustainability Index has 19 performance indicators of which 10 aspects are specifically relate to the positive contribution of E&RM initiatives to the SDGs. These KPIs include increase in energy savings, reduction in emissions, water conservation and waste recycling etc. Based on ongoing stakeholder engagement, if additional SDGs are identified then then corresponding indicators will form the part of ENOC Sustainability Index. We are also launching our new integrated Sustainability data management system to ensure accurate and timely data collection.

Defining baseline and goals

ENOC has already defined specific baseline and targets for its performance indicators in Sustainability Index reflecting SDG 7 and 12. The baseline year has been set as energy consumed in year 2013, with targeted energy cost reduction of 3% for 2018 - 2019, 7% for 2020 and 12% for 2021. The baseline and targets for other SDGs like Water, Gender equality, Climate action and Partnerships (community investments) are also defined in the ENOC Sustainability Index.

Firmly establish SDGs within ENOC

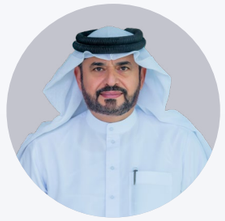
The selected SDGs are firmly integrated in business operations of ENOC as well as day to day decisions. This is achieved by integrating ENOC Sustainability Index in Score Card and all the corporate functions and BUs were mandated to improve/achieve on the target set in Step 4. Thus, every employee of ENOC, either top management or entry level, has the reflections of SDGs through Sustainability Index in their individual score card.

Announcing commitment to SDGs

ENOC's Sustainability Performance Reports and Annual review have clearly stated ENOC's commitment to sustainability. These commitments are in the form of targets against performance indicators detailed in ENOC Sustainability Index. Specific actions and commitment to SDGs from local geographical perspective are under discussion with stakeholders and will be detailed in subsequent year's Sustainability Performance Reports.

Partnerships and engagement

Furthering our commitment, ENOC has joined and contributed to several industry level, multistakeholder partnerships to innovate solutions to promote sustainability and by focusing on E&RM initiatives in relevance to the SDGs. These include engagement with Energy Institute (UK), Oil Companies International Marine Forum (OCIMF), Emirates Environmental Group and Heriot Watt University among others.



"The SDGs have inspired businesses to streamline their operations with the objective to enhance their roles as responsible businesses. We are proud to support the UAE's vision and create meaningful impact towards the SDGs. We are working with our stakeholders particularly on SDG 7, by pursuing sustainable and competitive access to energy in our markets."

Dr. Adel Al Ali

Senior Director GHSSE & Resiliency

Reporting on progress

The performance outcome of the Sustainability Index from the SDGs perspective is communicated to all stakeholders through ENOC Sustainability Performance Report. The upcoming Sustainability Performance Report and Annual Review Reports will further detail ENOC's specific actions on the selected SDGs and its outcomes.

Innovating on-the-go for a **New World**

ENOC is rapidly innovating to stay abreast with the changing environment trends. We are providing best-in-class solutions with ENOC NEXT, Beema, Link, and Service Station of the Future, among others, in addition to making digitalisation integral to our operations for improved productivity.

"ENOC has accelerated its innovation journey, which will provide a strong impetus to our growth strategy. Through ENOC NEXT, we are exploring ways in which we can tackle challenges in the energy sector. Our future growth plan involves venturing into green hydrogen, CNG and biofuels among other alternatives.

In a major achievement, Beema received the 'Best Insurtech Solution 2021' award by the Entrepreneur Magazine. The platform hosts over 1.8 mn online users, with excellent customer satisfaction levels. We are also the #1 player in B2B fuelling in the UAE with a market share of >50% for B2B delivery, which we fulfil through ENOC Link.

Moreover, through ENOC Link we offered an innovative digital fuel delivery service to the Expo 2020's logistics fleet. Lastly our 'New age service station' has achieved more than 55% energy savings (over baseline of 2016), which is an important milestone for us."

Hesham Ali Mustafa

Executive Director, Shared Services Centre,
Group HR and New Business Development

Inside this section

ENOC NEXT

Our digital ventures are part of our ENOC NEXT programme, driven by AI and Machine Learning and other new-age, upcoming technologies. Introducing myriad digital offerings for our customers has always been our strong suit, and these offerings have consistently provided promising returns. We are expanding our business portfolio with new avenues like ENOC Link, Beema, and ENOCPay, among others.

With ENOC NEXT, we have embarked on a disruptive innovation journey, which we believe will bring about a quantum leap in our growth strategy, business development and operational efficiency. With energy being the bedrock of human progress and prosperity, we remain steadfast in our commitment to creating a greener, brighter and better future.

We launched ENOC NEXT in 2018, an accelerator programme, designed to unlock growth opportunities and tackle challenges in the energy sector. NEXT underpins our commitment to the UAE's future agenda and Dubai' s vision to be a global platform for knowledge-based, sustainable and innovation-focused businesses.

ENOC NEXT is designed to deliver our vision for the future by building new digital ventures, enabling a digital transformation of the core through an organisation-wide SAP system implementation and digital upskilling of our workforce. We believe NEXT will enable us to build world-class competencies and drive operational excellence and profitable growth while delivering happiness to our people, customers and partners. ENOC NEXT theme going forward is centred around Energy Transition.

ENOC NEXT Programme

beema enoc link

ENOC NEXT plans for 2022/23

Digital Transformation Awareness Session

We are working to create a commercial hydrogen pilot with ENOC Link as the solution provider/integrator.

CNG Business

ENOC link is looking into the possibility of entering the CNG space with one of the largest Taxi companies in the Emirates.

Biofuels

As part of our sustainability efforts, ENOC Link will continue to deliver bio-diesel to its customers.

Carbon emissions offsets

We are assessing the opportunity to offer 'compensated fuel' to our customers. This allows them to offset the carbon emissions from using ENOC's fuel.

Gas flaring

We are looking into opportunities to reduce/reuse gas flaring for alternative revenue streams.

Plastic-to-waste

ENOC is continuing to explore potential partnership opportunities.

ENOC Beema

Beema is our motor insurance start-up, which offers the region's first all-online usage-based car insurance. It uses digital technology to assess risk, decide on the premium and reward the user. Its unique pay-per-kilometre proposition allows customers to earn cashback based on mileage as well as 24-hour accident recovery, guaranteed repairs and round-the-clock service. Beema has extended its services now to home and travel insurance.

The services have enhanced our digital interaction with customers, enabling us to tap into a complementary mobility value pool by integrating perfectly with our existing downstream fuel retail product portfolio.

Beema benefits from the data collected by the Company to design targeted and accurate pricing models for its insurance proposition. ENOC loyalty programs have given Beema the opportunity to drive additional traffic to the ENOC stations, along with new revenue streams.

The initial customer base was built through focused campaigns. We also extended the service through Tasjeel registration centres, and AutoPro sites, and linked it with the ENOC gift and reward systems.

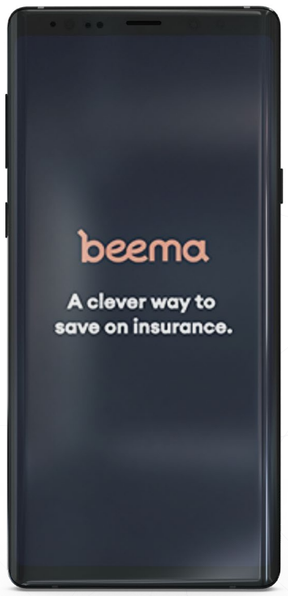
1.8 mn
ONLINE USERS ON OUR PLATFORMS

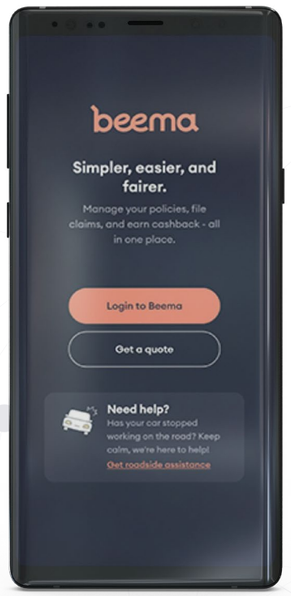
35,000+
CUSTOMERS SERVICED IN THE FIRST TWO YEARS OF OPERATION

1.2%+
MARKET SHARE CAPTURED IN THE FIRST TWO YEARS OF OPERATIONS

4.67/5
CUSTOMERS VALUE BEEMA, DEMONSTRATING THEIR SATISFACTION LEVELS

85+
EMPLOYEE NPS





ENOC Link

This is an innovative solution for providing app-linked mobile fuel delivery to small scale businesses, car owners, villa communities, and commercial premises across the UAE. For businesses, this ensures increased uptime, maximum traceability from order to delivery, and optimised fuel consumption. We use Radio Frequency Identification technology (RFID) technology for tracking fuel consumption. This technology matches a dedicated ENOC nozzle to a specific customer vehicle. With this, our commercial customers can monitor their fuel consumption against each specific asset within their fleet.

ENOC Link is an automotive refuelling service, under the aegis of which high-quality fuel is delivered straight to business premises at the customer's convenience.

On the B2B side, ENOC Link has developed a fully digital end-to-end process, from ordering fuel to invoicing. This online service gives customers full control over the fuelling process.

For Retail/B2C, we have revolutionised the traditional fuelling format by combining the benefits of a fixed petrol station with those of mobile delivery formats. The 'eLink Station' has been designed as a mobile fuelling station, and this station provides off-grid, low capital/high ATP stations that can be rapidly deployed under local/international regulations.

ENOC Link address three fundamental **industry trends** found in the UAE, and many emerging markets:

- Mobile delivery
- Energy transition uncertainty
- Lack of petrol station coverage

How it **responds** to these trends:

We are mobile

convenient 24/7 at customer location, covering all of UAE

We are digital

RFID fraud-free, connected meter e2e digital process, and customer dashboard

We are sustainable

Biodiesel is ~15% of sales (and growing), developing a 'fuel save' product for B2C/B2B customers

Case Study

ENOC Link's distinct advantages in the long-term

Revolutionising traditional B2C model: Digital mobile fuel delivery is an industry trend that is here to stay (UAE, Malaysia, India, EU, US, etc.). Additionally, our mobile fuel station concept is revolutionising the traditional B2C model

Capital efficiency: Mobile delivery in B2B avoids capex spent on fixed tank facilities at customer locations; in B2C, the eLink Station investment required is ~40% of a fixed petrol station (capacity-adjusted), driving ROCE up

Speed to market: Short construction period (6-12 weeks), limited/no regulatory constraints, and no utilities/civil works required

Flexibility of deployment: Fleet can switch between B2B/B2C modes; small footprint requirement, and flexibility on up to 4 fuel grades

Case Study

ENOC Link set to fuel Expo 2020 Dubai fleet

As the official integrated energy partner of Expo 2020 Dubai, ENOC offered innovative digital fuel delivery service to the Expo's logistics fleet. Our use of latest technology enabled us to offer a safe, streamlined, and seamless process for refuelling. As we do our customers elsewhere, at the Expo, we also offered fuel analytics, fleet management and mileage reporting. Our B2B customers at Expo 2020 Dubai were able to access a macro and micro view of fuel consumption through our tracking services.

Our key product offerings included diesel, biodiesel B5 and B20, and petrol, provided by fuel trucks that are compliant with the highest international safety standards. They delivered more than one million litres of fuel to the Expo 2020 Dubai fleet.

Impact

ENOC Link's products and services are helping industry players significantly reduce investment risks in the wake of a fast-changing regulatory environment driven by energy transition. This will be especially true for growth markets with a lack of adequate fuelling infrastructure.

Since the launch of the business in late 2019, ENOC Link has achieved significant milestones.

#1 player

IN B2B FUELLING IN UAE WITH >80 CUSTOMERS AND A MARKET SHARE OF >50% FOR B2B DELIVERY

Exceptional

START-UP GROWTH RATES OF +10% PER MONTH IN 2021

>50

DELIVERY TRUCKS/MOBILE STATIONS IN OPERATION

The new-age service station

As the official integrated energy partner of Expo 2020 Dubai, ENOC created a completely self-sustained service station of the future. Inspired by the UAE's national tree, the Ghaf, the station features a futuristic design, resource efficiency and self-sustainability, exemplifying ENOC's forward thinking spirit. ENOC recorded 4,000,000 man hours, during the construction of the fuel station, with zero lost time injury, demonstrating its commitment to adhering to best practices in health, safety and environment.

Contributing to Economic and Environmental Goals

The ENOC project has made sincere efforts to drastically reduce the overall energy consumption in the building, as compared to similar standard fuel stations. In comparison with the ASHRAE 90.1-2016 Base case, the project has achieved more than 55% energy savings. While a conventional fuel station uses 1,492 MWh of electricity in a year, the ENOC futuristic station is expected to consume as little as 672 MWh of electricity annually. This drastic reduction in power consumption is made possible with the use of solar and wind power, which offsets carbon emissions and electricity consumption.

The Service Station of the Future will serve the logistical needs of the fleet for Expo 2020 Dubai global event and afterwards be part of the smart and sustainable District 2020, designed to evolve beyond the Expo 2020.

Impact of the station

We carried out Life Cycle Assessment for the Service Station of the Future project structure.

The project is the first in the MENA region to achieve LEED Safety first pilot credits in response to the COVID-19 pandemic.

Key Features of the Station

The world's first leed platinum service station

The service station of the future incorporates a green building design and sports unique energy conserving measures. It is the world's first LEED Platinum certified service station.

Renewable energy powered

283 integrated transparent solar panels, installed on the canopy at the service station, allow natural lighting during the day while providing 100% UV protection.

EV-charging tree to represent the 7 emirates of the uae

An EV charging 'Ghaf' tree with 4 charging units. The tree is shaded by 7 ETFE leaves, each representing an Emirate of the UAE.

Digital screens

Digital signage at the station consists of 12 mn LED chips to illuminate the digital screens onsite instead of using conventional printed stickers.

Free electric charging for the inaugural year

Non-commercial users will be able to avail free electric charging services until December 31, 2021, as per Dubai Electricity and Water Authority mandates.

Sturdy carbon-fiber canopy

The station has a uniquely designed canopy, shaped to resemble the exoskeleton of the UAE's national tree, Ghaf. The 133 multi-layered canopy was built using more than 37 tonnes of carbon fibre, a lightweight and sustainable alternative to steel, a first for a service station in the region. The nine-tree 'trunks' that support the station were built from **43,000 sq m** of carbon fibre.

Application of AI and machine learning

The service station also includes several applications run by advanced machine learning, artificial intelligence and data analytics technologies that play a key role in customising services, and retail offerings for customers, managing queue and waiting times at the forecourt, and in improving the overall customer journey.

Regulating traffic

Vehicle mapping surface lighting is deployed to mark traffic flow to direct vehicles to the fuelling area as well as entry and exit. Occupation sensors and signals at fuelling positions manage traffic flow, redirecting vehicles to empty spaces at dispensers.

Advanced vapour recovery system

Using refrigeration condensation principle, the unit recovers gasoline vapour while controlling VOC emissions and converts 70% fumes back to fuel.

Wind turbine system

For the first time in the UAE, a 25-metre wind turbine, generating 12.7 MWh per year, powers the station which has its own on-grid metering facility.

UV Ray-protected and corrosion-proof

The canopy encloses a leaf-shaped ethylene tetrafluoroethylene (ETFE) cushion canopy, said to be 100 % UV ray-protected and corrosion-proof. The canopy is illuminated with more than 3,800 LED light modules.

Smart energy monitoring and conservation

A dedicated building management system efficiently monitors and controls HVAC and lighting systems as well as water and electrical consumption. High-efficiency VRF systems reduce energy consumption by at least 35%.

Effluent recycling

Other sustainable features include the use of carbon filtration technologies to recycle and reuse grey water for irrigation.

Producing drinking water

The station produces drinkable air units that use ozonation techniques to convert water molecules from humidity in the air into drinkable water for onsite staff.

Expanding our clean fuel portfolio

Biodiesel is an advanced alternative green fuel, commonly used for diesel engines and has proven to significantly reduce carbon footprint. The product, which has been tested and certified in the UAE, is used by many companies in the transport and logistics sector as well as in construction as it also helps improve engine performance. This helped us to stay ahead of an ever-evolving market while facilitating ENOC's strategy to contribute to climate change mitigation. Biodiesel is now available as Biodiesel B5, B20 and B100.

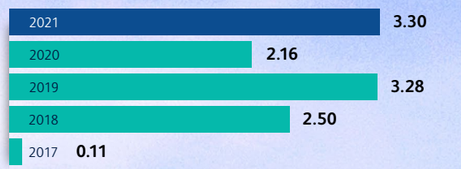
Biodiesel is processed from used cooking oil and refined through transesterification, a chemical process which involves the separation of glycerin from the cooking oil, which then produces methyl-esters or Biodiesel5. Adopting Biodiesel5 as an alternative fuel is the simplest and quickest way to reduce carbon footprint without impacting fuel consumption, storage infrastructure and any engine modification.

Today, Biodiesel5 has established itself as clients' preferred clean and green fuel for regular use, and also as an alternative to mineral diesel. We have entered into MoUs with clients to ensure efficiency of their equipment. We have also installed dedicated tanks of Biodiesel5 and dispensing units for the green fuel wherever required.

Biodiesel sales 2017-21

BioDiesel5

VOLUME (MILLION LTRS)



Commenced Biodiesel5 delivery from July 1, 2021 at the Shabka station

Case Study

Biodiesel5 for traditional Abras

We collaborated with Dubai's Roads and Transport Authority (RTA) to launch the pilot project to power five Abras or traditional boats run by private operators with Biodiesel5. During the three-month pilot, we worked with RTA to assess the emissions of Biodiesel5 powered Abras compared to those run-on regular diesel. ENOC appointed a specialised third party to examine and evaluate the results of the study. The main agenda of this study was to measure the reduction in emissions and to determine any negative effects on diesel engines as a result of using biodiesel.

The monitoring of engines was conducted through two separate campaigns across a period of three months. In the first, two boat engines were tested with ENOC Biodiesel5 and then they were again tested with regular Diesel 10PPM. Exhaust emission monitoring was carried out for SO_2, NO_x, CO, CO_2, O_2, total unburnt carbon, particulate matter and polyaromatic hydrocarbons. The pilot proved successful and yielded positive result since no negative effects were detected while operating Abra motors using biodiesel.

The experiment showed a reduction in emissions, compared to those using regular diesel. Research indicates that the use of biodiesel will reduce unburned hydrocarbons, emission of CO_2, fine particles, and sulphate gas. Following the experiment, RTA has been collaborating with ENOC for a designated station (pontoon) at Sabkha Marine Transport Station for the supply of biodiesel to traditional Abras operating on the Dubai Creek.

Case Study

Biodiesel for commercial fleets through ENOC Link

In 2020, we started offering biodiesel through ENOC Link. This is the only digital mobile fuel delivery service for businesses in the UAE, offering biodiesel fuel for commercial fleets. ENOC Link delivery trucks, with tank capacities varying from 800-5,000 litres, offer customers easy and convenient access to B5, B20 and B100 biodiesels manufactured by ENOC.

The world is transitioning towards **New Energy**

At ENOC, our efforts are directed towards enhancing energy efficiency through constant technology upgradation. Together with technology adoption, we have systematically entered partnerships to enhance energy saving opportunities.

We have also reaffirmed out commitment to furthering Dubai's Clean Energy Strategy 2050, to make Dubai a global centre of clean energy and a green economy. Through the ENOC Energy Awards and our association with top educational institutions, we are training the next generation in the importance and ways to make energy efficiency a part of everyday action while leading the industry by implementing E&RM across our operations.

"At ENOC, we strive to embed energy efficiency across each aspect of our business. Over the years, we have been continuously adopting various strategies to accelerate our growth as industry leaders in sustainable energy.

We have deployed alternatives for efficient cooling systems that have helped us reduce 30 tCO_2e/year, and we are utilising excess gas to reduce ENOC's overall energy consumption. This resulted in creating cost benefits of AED 1,365,412 in 2021. Moreover, we are optimising airport fuelling operations which has helped us reduce 8-11% of our energy consumption. We are also working on enhancing efficiency with superior system designs by improving Compressed Air System Performance at ELOMP.

We will continue to make strides in this direction and consolidate our position as leaders in energy efficiency performance."

Mr. Burhan Al Hashemi,
Managing Director, Commercial and International Sales

Inside this section

Exploring efficient cooling alternative

The installation of the wet wall evaporative system at our LPG filling plant has appreciably increased the effectiveness of the cooling system while reducing electricity consumption and substantially enhancing energy saving. This system provides a solution across all industries that use the HVAC system.

Implementing the Wet Wall Evaporative System

EMGAS Jebel Ali LPG Filling Plant

The wet-wall evaporative cooling technology has shown great potential for development and opportunity for improved efficiency. Its main principle focuses on evaporating water to cool the intake air to the condensing coil of any Air Cooling (AC) system. This is done by installing a cupboard of mesh-like material all around the condensing coils. Once done, water is injected on top and gravitational force is used to wet the whole wall all the way down to create a Wet Wall. Subsequently, the hot air that enters the condensing coils will passes over these Wet-Walls, which lead to the evaporation of water and reduce its temperature. In this manner, the air intake to the condensers is much lower in temperature than the ambient air, which results in a minimum 8% energy savings.

The admin building of the EMGAS Jebel Ali LPG filling plant has two ACs installed, each with a capacity of 20 tonnes. These consume a significant amount of energy. In order to improve the efficiency, a wet wall evaporative system was installed to increase the efficiency of the cooling system.

4800 kWh
ANNUAL ENERGY SAVINGS

30 tCO_2e/year
CARBON EMISSION REDUCTION

AED 3,204
COST SAVINGS PER YEAR

Horizon Emirates Terminals

The administration building at Horizon Emirates Terminals has two air-cooled carrier chillers, which were a significant source of energy consumption. As part of the energy saving initiative program, it was identified that the chiller unit for the building was running continuously during summer. Taking cognisance of this, we evaluated solutions to reduce the load on the chillers, following which we installed the wet-wall evaporative cooling system to reduce electricity consumption.

8-11%
REDUCTION IN ENERGY CONSUMPTION

65%
SATURATION EFFICIENCY

AED 32,277
COST SAVINGS PER YEAR

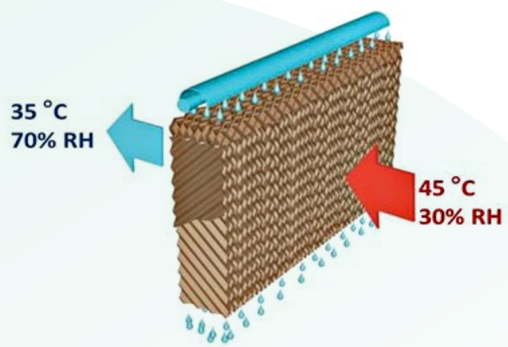
Exploring Efficient Cooling Alternative

Case Study

How the Wet Wall Evaporative System Works

The wet wall system is a setup where the DBT of the ambient air is reduced by increasing its relative humidity. In this system, ambient air is forced to mix with a counter flow water curtain over an exchange surface that allows greater contact over a duration of time, sufficient to increase the relative humidity of the ambient air. This lowers its temperature by 6-15 degrees Celsius, thereby increasing the efficiency of the condenser.

The system is based on the principle of evaporation. It uses high efficiency cooling pads, which become wet through an elaborate, controlled water distribution system. When water meets air, the water absorbs energy from the air, resulting in evaporation. The wet-wall cooling pads help to cool the air. As the air moves through the wet cooling pads, its temperature drops before it travels through the chiller condenser coils. In practice, our wet wall system creates 'spring conditions' in the middle of summer.



Principle of evaporation using cooling pads

Energy Savings

The cooling pads are, on an average, 65 to 75% more efficient in reducing the ambient air temperature. This translates to ambient air temperature reductions between 6-15 °C, depending on the time of the day and the season of the year. Such ambient air temperature reductions are expected to produce up to 7-15% reductions in kW/TR values of air-cooled chillers, further reducing the chiller's energy consumption.

A reduction in energy consumption between 8-11% of the chillers' annual energy consumption has been observed for chillers equipped and functioning with the wet-wall evaporative cooling systems as compared with others without the same system.

Our wet-wall evaporative cooling system is equally applicable to all air-cooled condenser units and can be used to pre-cool the air entering gas turbines, to increase their efficiency.

Water Management

The system is equipped with a control system and a special control algorithm, which optimises the operation of the wet-wall in response to ambient weather conditions and the chiller's operational status at the time. This ensures highest efficiency with the least amount of water usage.

Payback Period

Around 2.5 years under the present electrical energy tariff of 44 fills /kWh and water tariff of AED 10.50 per m³ in Dubai.

Additional Benefits of the System

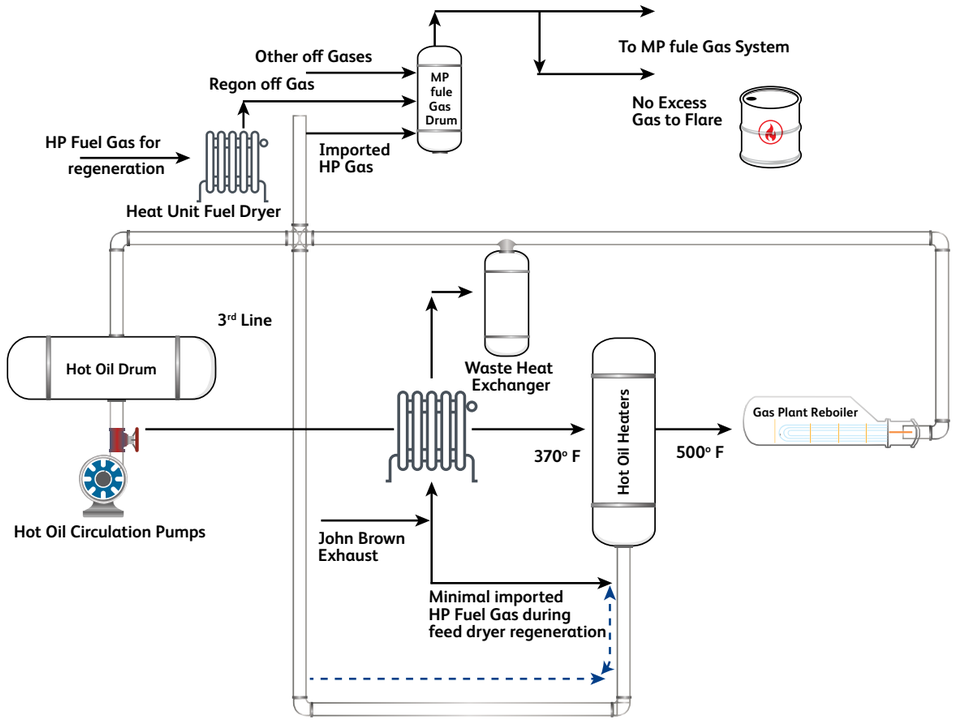
- Ensures cleaner condenser coils, thus contributing to their longer life, with less frequent maintenance and replacements. This leads to monetary savings in the long-term.
- Produces lower head pressures of compressors, which prolongs the compressor's life and requires less overhauling. This fosters indirect monetary savings.
- Increases the chiller's cooling capacity, especially the ones operating within design limits.
- Reduces the chiller's noise.

Utilising excess gas for reducing energy consumption

At DUGAS, the engineering team worked out an innovative solution to prevent valuable energy in the form of heat getting lost, which also cut down on emissions and reduced usage of natural resource.

The regeneration system of DUGAS is intermediate. The fuel gas in the feed dryer system flows to the flaring system. This led to loss of energy and as well wastage of natural resource. Since DUGAS stopped operation of its captive power plant, flue gas heat recovery system is not in operation. As a result, additional fuel is required to run the hot oil heater system. The DUGAS engineering team laid down a pipeline from the regeneration feed dryer system to the hot oil heater system to capture the fuel, which was being flared.

Utilisation of excess gas-modified scheme



Financial and Environmental Benefits for ENOC

AED 1,365,412

SAVINGS ACHIEVED IN 2021

7,500 tCO_2/year

APPROXIMATE REDUCTION IN CO_2 PRODUCED BY FLARING EXCESS MEDIUM PRESSURE FUEL GAS

Efficiency by better design

Case Study

Improving Compressed Air System Performance at ELOMP-Fujairah

ELOMP-F historically uses a large amount of compressed air in its operations. As part the Energy Management System, the compressed air system is identified as a Significant Energy Use (SEU) and subjected to monitoring. It was found that the system accounted for more than 25% of plant's electrical energy consumption. Some of the equipment were set with precision for air requirement and enabled a shutdown if the pressure dropped.

ELOMP-F and the Group Sustainability Team jointly conducted an air circuit audit and implemented the following actions to reduce energy consumption.

Compressed air loss reduction program

- Re-programming of machines for lowest possible air requirement and higher tolerance
- Reducing compressed air pressure (8.4 to 7.5 bar) for greater optimisation
- Energy Performance Indicator (EnPI) of the compressors – Average EnPI reduced from 4.7 KWhr/KL in 2020 to 3.82 KWhr/KL in 2021; reduced machine stoppages improved productivity
- Currently replacing poly urethane tubes used in pneumatic network with PVC coated copper tubes

Case Study

Change of cooling tower pumps

At ELOMP-F, our lubricant and grease manufacturing plant at Fujairah, site surveys and audits were conducted by the Group Sustainability Department. The results highlighted the areas where energy usage could be optimised and subsequently, we implemented simple interventions that led to significant improvement.

Identifying the problem

We were utilising the cooling tower for the cooling of hot grease after the manufacturing of lubricants and industrial products through heat exchangers. As per design calculations, while commissioning the system, the circulation pumps installed were of higher capacity than required for the operations. This led to higher energy consumption. The pumps consumed 14 KWhr of power during regular operations.

Driving improvement

ELOMP-F and the Group Sustainability Team jointly conducted a site survey and calculated the heat load on the cooling water system. They found that the actual need was significantly lower than the previous calculations during the design stage. We decided that the cooling tower circulation pumps would be replaced with ones of lower capacity as per the present operational requirement at plant. The newly installed pumps consumed only 2.2 kWh of power compared to 14 kWh before.

Case Study

Heat recovery from feed dryer regeneration-Heating cycle (Diversion to Hot Oil Heater)

Flue gas (stack gas) gets emitted from combustion plants, which consists of residual substances such as particulate matter (dust), sulphur oxides, nitrogen oxides, and carbon monoxide. Considered mostly as waste by the companies, flue gas is often exhausted to the environment without being reutilised for benefits.

Identifying the problem

As the regeneration system of DUGAS is intermediate, the flue gas in the feed dryer system gets transferred to the flaring system, which releases the gas through a series of flares as per the process requirements. This was leading to energy and natural resource wastage that could have otherwise been minimised.

Efforts taken

Since DUGAS shut down its captive power plant, the flue gas heat recovery system, which earlier fuelled the captive plant, is no longer operational. Therefore, additional fuel is required to power the hot oil heater system.

The DUGAS Engineering team found an innovative solution for recovering the heat from the feed dryer. They installed a pipeline from the regeneration feed dryer system to the hot oil heater system, thus capturing the previously flared fuel. This process is effective in reducing CO_2 emissions produced by flaring and is also cost effective.

Impact of the station

AED 1,365,412
TOTAL SAVINGS ACHIEVED BY THE END OF Q4 2021

7,500 tonnes
CO_2 EMISSIONS AVOIDED/PER YEAR

84,240 MMBTU
SAVED

Case Study

Reduction in hot oil circulation temperature

Identifying the problem

The hot oil system was previously connected to the heat recovery system of DUGAS' captive power plant. As the captive power plant stopped operating, there was no heat recovery system to regulate the temperature in the hot oil system. With the lack of a heat recovery system, the system became the significant consumer of natural as at the plant.

Efforts taken

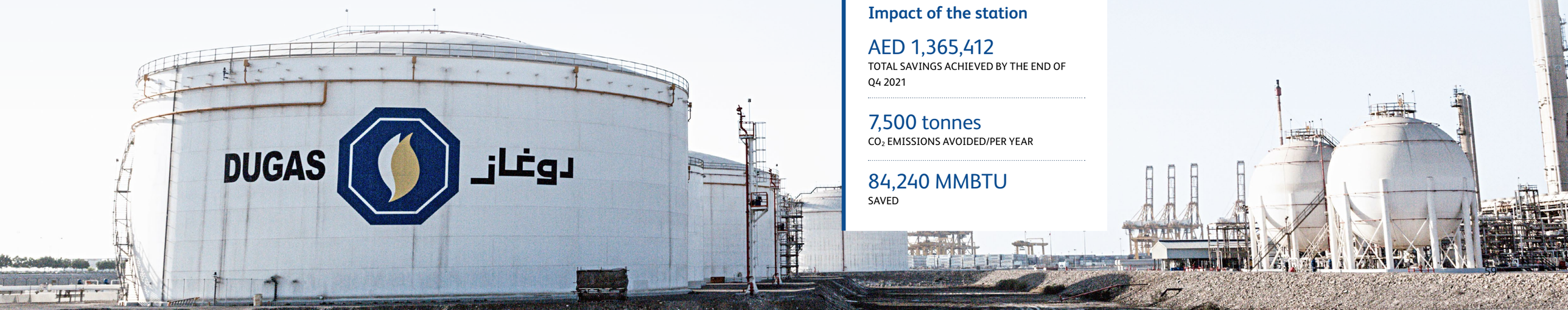
To understand and analyse the heating circulation temperature process of the Hot Oil Heater, the DUGAS Engineering team launched a study in 2021. It was observed that the hot oil system functions efficiently even with a reduced heating circulation temperature. This practice was then continued for better efficiency. This led to reduced dependency on natural gas and decreased our carbon emissions.

Impact

76,505 MMBTU
OF NATURAL GAS SAVED

1,103 tonnes
CO_2 EMISSIONS AVOIDED/PER YEAR

AED 1.24 mn
COST SAVINGS PER YEAR



Efficiency by Better Design

Case Study

Optimising Pumping Operations in Terminals

At our HTTSA terminal, pumping involves significant energy use product to and out of the storage tanks or Terminals. In fact, these pumps are responsible for more than 65% of our total electricity consumption. Therefore, it was imperative for us to optimise our pump energy consumption.

Efforts taken

As a solution for optimised pumping energy requirement, we started by using gravity to move the product.

To reduce the energy consumption of pumps, we have installed Variable Speed Drives (VSDs). However, there was scope for further improvement, and so we introduced an innovative zero cost solution, wherein the unloading was a factor of gravity without the need to use pumps.

Impact

346,392 kWh
REDUCTION IN ELECTRICITY CONSUMPTION

AED 197,374
SAVINGS IN COSTS

254 tCO_2
EMISSIONS AVOIDED

Case Study

Reduction Gas Minimisation

The DUGAS Engineering team initiated a project towards minimising the reduction gas during the year 2021. We have been successful in building substantial savings during the year by introducing minor modifications in our processes at a minimal project cost.

Impact

47,539 MMBTU
ENERGY SAVED DURING THE YEAR 2021

686 tonnes
CO_2 EMISSIONS AVOIDED/PER YEAR

AED 768,188
COST SAVINGS PER YEAR

Improving energy efficiency through ESCO model in retail

As a core part of our sustainability roadmap, we have partnered with Etihad ESCO, with an objective to enhance energy saving across its operations in the UAE. Our partnership with Etihad ESCO has enabled us to equip and retrofit 10 of our old generation service stations with improved conditioning, automated lighting, and solar photovoltaic (PV) systems. This project is expected to decrease energy consumption by 40% across the respective stations in the next 7 years.

This partnership is a testament to our mutual commitment and vision of supporting the Dubai Clean Energy Strategy 2050 to help generate 75 per cent Dubai's total power output from clean energy by 2050.

We have deployed various energy conservation measures (ECM) such as installation of energy efficient lighting solutions, programmable thermostats and solar PV systems among others. In view of the success observed through these pilot project results, we are planning to replicate similar ECMs across ten sites subject to site surveys to ensure optimal ECM's are installed in each site depending on their energy savings potential. The phase 2 of the project is yet to commence.

Optimising airport fuelling operations

To optimise and speed up fuelling operations at Dubai Airport, EPPCO Aviation introduced a second satellite station to cover the fuelling needs of the Gulf, Alpha and Delta Bays within the Dubai Airport. The satellite stations are acting as sub-stations to the main station. They are located across Dubai airport runway to make sure to cover maximum area possible and be as efficient as possible when delivering fuel to aircrafts.

Case Study

The first satellite fuel station for Dubai Airport

With the support of Dubai Airport, EPPCO Aviation set up the first satellite fuelling station in 2017 to fuel aircraft within Charlie, Fox Trot and Bravo bays (bays across the airport to cover the maximum area). The station had six fuelling hydrant servicers in strategic locations to help save the journey distance and time, and thus cut down diesel consumption.

Needs assessment

In 2019, the idea of a second satellite station was proposed to the Dubai Airport Authority. The move would help reduce road congestion and avoid delay in fuelling in the vicinity of the Alpha, Gulf and Delta Bays.

An initial survey was conducted to assess the fuel requirement for Alpha, Gulf and Delta Bays. We used 2019 data because these bays were closed due to the COVID-19 pandemic from April 2020 till October 2021. The bays re-opened in November 2021 as flights increased in the last quarter of 2021, reaching 70% of the number of pre-COVID flights and throughput of fuels.

Flights fuelled in 2019

Alpha Bays	Delta Bays	Gulf Bays	Total
6,865	6,831	2,804	16,500

Fuelling was done from three sources for these 16,500 flights for the whole of 2019 in the Alpha, Gulf and Delta Bays. In order to assess the flights fuelled by each bay, we exclude jumping flights in which operators can complete the flight within the same area e.g., Delta 1 Bay jumping to Delta 8 Bay because the mileage can be subjective.

Following discussion with supervisors, the following is an approximate deployment for fuelling at these bays.

Jumping Flight	From ITP building	From Satellite 1
20%	40%	40%
3,300	*6,570	*6,570

*Actual number is 6,600 for 40% of 16,500. However, number has been changed to 6,570 as per calculation of 18 fuelling per day.

Total number of fuelling expected from both ITP and Satellite 1

Jumping Flight	From ITP building	From Satellite 1
Approximate as per 2019 data	6,570	6,570
Daily average	18	18

Tabulation of approximate diesel usage and mileage from both ITP and Satellite 1 station based on to and from trips

Take note that diesel calculation is based on diesel tank capacity after reaching destination and not as per the scientific diesel measurement instrument. We use Alpha 10 fuelling as the base line for calculations as this bay is the farthest.

The second satellite fuel station at Dubai Airport

Based on the estimates, six fuelling vehicles were planned for the new station. The location of Satellite 2 station is strategic so that it can cover Alpha, Gulf and Delta bays. It also reduces the distance to the fuelling site, thus helping save in cost of diesel. In addition, it reduces operators' risk driving on congested airport roads, especially during the peak

15,904 litres
ESTIMATED DIESEL SAVING

AED 40,714
ESTIMATED DIESEL SAVING ANNUALLY

43 tCO_2
EMISSIONS AVOIDED PER YEAR

Satellite fuel station 2

Creating a world of **New Opportunities**

In tandem with the evolving times, our businesses are raising their E&RM ambitions. At the same time, we are enhancing our capabilities to deliver on our energy efficiency parameters. This progression is evident in our growth from an oil and gas energy partner to an integrated clean energy partner over the past few years. Our E&RM strategy has been a major enabler in this transition. We aspire to further drive this transformation within the organisation through our overarching strategy of 'One ENOC'. This strategy aims to bring together our diverse businesses through shared values and ethics. We are proud of our journey so far and strive towards a stronger tomorrow as the sustainability leader in the region. We have been setting industry benchmark and are shaping the dialogue on energy management through active participation in national and international fora. In order to further our commitment to the society, we have established partnerships with top universities and introduced the ENOC Energy scholarship to train and inspire the youth to take the lead in creating a more sustainable future for all.

"We believe in creating opportunities. Being a key member of the DSCE, it is our motto and responsibility to actively contribute and partner in the UAE's vision and to contribute to its growth story. Through our unique initiative, ENOC Energy Fund, we have deployed best-in-class technology and aim to achieve 10% reduction in ENOC energy cost over the next 5 to 10 years. Moreover, our compact stations have also showcased immense progress with a 60% reduction in turnaround time for implementation compared to conventional stations. Through our key Energy & Resource Management initiatives, ENOC Energy Scholarships, we granted four scholarships this year towards the growth of the energy leaders of tomorrow."

Eng. Alia Ali Busamra,
Chief Sustainability Officer

Inside this section

ENOC's contribution to local vision and goals

Both the UAE and Dubai government are committed to long-term sustainability goals so as to make the country a contemporary knowledge centre and an internationally significant hub of commerce. With the ever-increasing number of sustainability mandates and directives, both locally and globally, ENOC has been playing a critical role in implementing the UAE government's long-term vision on the ground and leading the change for the sector in the region.

As a national energy provider, we are contributing to both the national agendas such as UAE Vision 2021 and UAE Energy Strategy 2050. We also support local agendas such as the Dubai Plan 2021,

Dubai Clean Energy Strategy 2050, Dubai Integrated Energy Strategy – DIES 2030 and the Dubai Demand Side Management Strategy 2030 (DSM 2030). By optimising energy use through continuous innovation and the use of advanced technologies, our energy efficiency initiatives have allowed us to significantly reduce our costs year on year. This approach, which promotes energy conservation and efficiency, helps ENOC in positioning Dubai as a global leader among smart energy efficient cities.

UAE Vision 2021

Aims

To shift to a diversified and knowledge-based economy through a series of pillars. Specifically, 'Sub-pillar A: Sustainable Environment and Infrastructure' by preserving the environment and achieving a perfect balance between economic and social development; and 'Sub-Pillar B: Competitive Knowledge-Based Economy' by transitioning to a knowledge-based economy, promoting innovation, research and development – by instilling an entrepreneurial culture in schools and universities to foster generations endowed with leadership, creativity, responsibility and ambition.

Impact and contribution

ENOC contributes to 'Sub-Pillar A' by converting existing building assets into green building. All our future assets are already built to be green. Additionally, all the new stations of ENOC are green sustainable stations, which showcase integrated innovative renewable energy solutions that contribute towards building a sustainable infrastructure.

We have been contributing to 'Sub-Pillar B', through our educational scholarship programmes – the ENOC Energy Scholarship for young UAE nationals and other educational youth award schemes, within the field of energy and resource management.

ENOC's contribution to local vision and goals

UAE Energy Strategy 2050

Aims

- To increase the contribution of clean energy in the total energy mix from 25% to 50%. To reduce carbon footprint of power generation by 70%
- To increase consumption efficiency of individuals and corporates by 40%

Impact

We support the UAE Energy Strategy for 2050 through the following:

- Integrating renewable energy within operations (such as the UAE First Solar PV Station)
- Installing solar PV in business units
- Introducing low carbon fuel such as Biodiesel5

To track the progress of the above initiatives and to encourage faster adoption of clean energy, ENOC's Sustainability Index have KPIs such as 'Renewable energy generation against consumption' and 'Carbon intensity reduction'.

Dubai Plan 2021

Aims

To look at the living experience of Dubai's residents and its visitors through their interaction with environmental, economic and social services by developing 'A smart and sustainable city' through sub-pillar 'sustainable with its resources' by using resources sustainably in line with international best practice consumption, efficiency and management while improving its dependence on renewable energy sources.

Impact

We have contributed to this mandate by:

- Building the UAE's first smart station enabling consumers to pay and track consumption through RFID and 'ENOC Pay' solutions
- Implementing advanced energy monitoring systems to measure, monitor and analyse energy performance of business units
- Integrating alternative renewable energy solutions like solar PV
- Adopting sustainable initiatives like car wash recycling and vapour recovery systems

Dubai Clean Energy Strategy 2050

Aims

To produce 75% of its energy requirements from clean sources by 2050 and to make Dubai a global centre of clean energy and green economy.

Impact

ENOC directly contributes to this mandate by integrating clean energy sources within its operations. One of the major initiatives taken by ENOC over past few years is implementing solar PV generation where possible (stations, terminals, warehouses etc.). Our solar power consumption is increasing YOY.

Smart Dubai

Aims

To envision Dubai as a city where all its resources are optimised for maximum efficiency, where services are integrated seamlessly into daily life through sub-pillar: 'Resource & Infrastructure Impact' - where Dubai's resources, energy and infrastructure are sustainable and resilient, supporting a clean and healthy environment.

Impact

ENOC has introduced the first Smart Petrol Station with 'Smart Design and Energy Efficient Technologies' with plans to ensure that all future stations being 'Smart Petrol Station' in the coming years.

Dubai Supreme Council of Energy (DSCE)

We aim to contribute to Dubai's sustainability vision captured in the Dubai Plan 2021, the Dubai Integrated Energy Strategy 2030 (DIES 2030) and the Dubai Demand Side Management Strategy 2030 (DSM 2030). We are a key member of the Dubai Supreme Council of Energy (DSCE), and play a dual role by actively contributing to the Emirate's sustainability vision as well as sharing technical industry-level expertise in our advisory role.

We are a member of various committees of DSCE including the Advisory Committee, the Integrated Gas Supply Committee, the Demand Side Management (DSM) Executive Committee, the Dubai Carbon Abatement Strategy (CAS) – Technical Committee, the Green Procurement Committee, and the Committee for CNG.

We continued to work closely with the DSCE to define the scope of petroleum product regulations and are part of the regulatory committee formed to establish key regulations to ensure safety and limit illegitimate trade. ENOC's Managing Director, is part of the Products Trade Regulatory Committee. The taskforce comprises 15 government entities including the ENOC Group. The taskforce reviews, advises and defines framework for the implementation of regulations and legislations that govern petroleum products trade, including gas, diesel, and petrol.

In addition, EMGAS, our subsidiary, has been working closely with the World LPG Association (WLPGA), a leading global association for the gas industry and a key consultant to the UN Economic and Social Council.

Case Study

Green Building

Ras Al Khaimah Energy Efficiency and Renewable Energy Strategy 2040 was launched in 2018. Ras Al Khaimah Municipality's new green building regulation, Barjeel, has become mandatory from January 2020 for all new construction in the Emirate. Opened in November 2019, Tasjeel RAK Auto Village complies with Barjeel, UL certified double wall tanks and double wall fuel piping. It has advanced vapour recovery system, LED lights, Variable Refrigerant Flow (VRF) technology and provision for solar power in the future.

50,000 m^2
GREEN BUILDING SPACE

Targets to be achieved by 2040

30%
ENERGY SAVINGS

20%
WATER SAVINGS

20%
OF TOTAL ENERGY TO BE RENEWABLE ENERGY

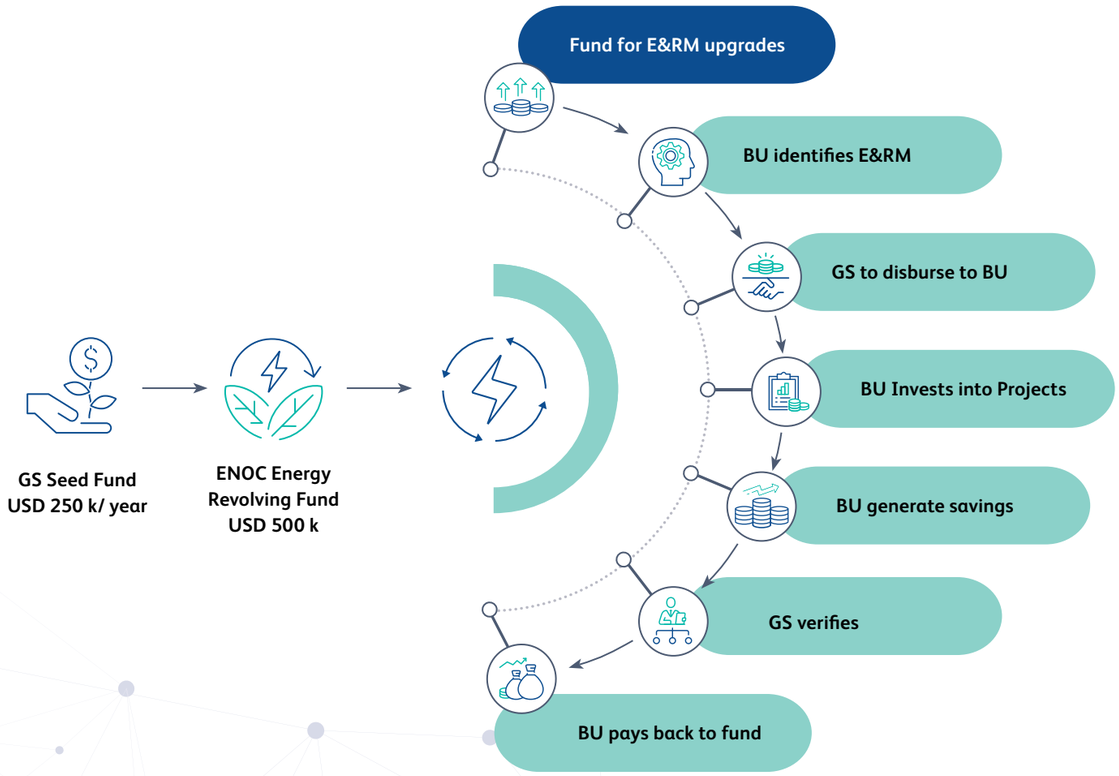
ENOC energy fund

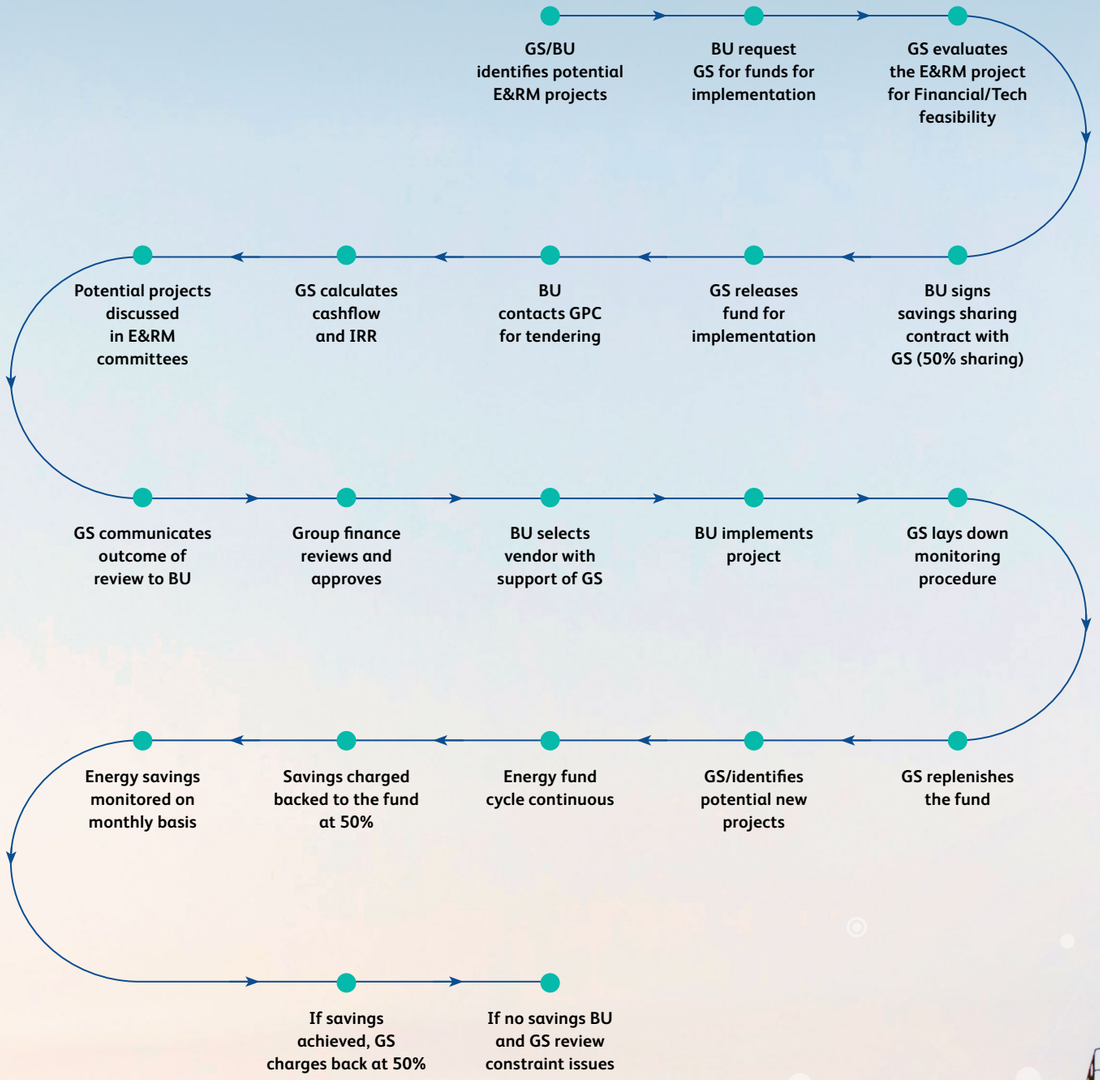
It has been our constant endeavour to drive significant achievements through our E&RM strategy and identify potential projects that can promote our long-term sustainability vision. To support this strategy, this year we established the ENOC Energy Fund to provide momentum to our energy efficiency projects that have the potential to create a significant impact and drive meaningful change.

Currently, our Business Units implement energy efficiency measures and projects using their own maintenance OPEX. Since the ideas generated required the relevant funding, there were delays in project execution. To resolve this, we have created a centralised fund for yearly projects across the Group. The savings of these projects will be returned to the fund, and the remaining amount will be allocated to that Business Unit budget.

The Energy Fund will be managed by Group Sustainability Department at the ENOC Group level. All businesses will propose potential Energy & Resource Management (E&RM) projects and savings. The projects will then be allocated the necessary budget and will be implemented.

In the first year, a funding of USD 250,000 is envisaged. This fund will encourage employees to ideate, innovate and strive to develop energy and resource conservation projects. With Energy Fund we aim to achieve 10% reduction in ENOC energy cost over next 5 to 10 years.





Impact of ENOC energy scholarships

The ENOC Energy Scholarship was launched in 2016 in partnership with the Heriot-Watt University. It helps in building the leaders of tomorrow by supporting deserving UAE nationals within the ENOC Group and in the UAE as they set out to pursue their Master's degrees in energy management.

AED 71,500 mn
AMOUNT SPENT ON EACH SCHOLAR ELECTED FOR THE SPONSORSHIP FOR 2022

4
YOUTH BENEFITTED FROM THE SCHOLARSHIP

The scholarship covers the complete tuition fees for the selected candidates. ENOC also offers employment to candidates who have completed the program with distinction. The scholarship gives UAE nationals the unique opportunity to gain an international degree while they acquire advanced skills applicable in the energy sector.

The Master's degree covers diverse topics related to the energy curriculum, such as Technology Future and Business Strategy, Critical Analysis and Research Preparation, Demand Management and Energy Storage. Through the scholarship, we seek to develop the leaders of tomorrow.

In 2019, when the scholarship was in its third year, we carried out the Social Return on Investment analysis to assess the value created for the candidates in terms of knowledge enhancement, skills developed and improved career prospects. The study revealed a social return of AED 8.12 (USD 2.21) for every Dirham invested. Further, the study also indicated a fair distribution of the social benefits between the selected candidates and the UAE Government.

Our interactions with stakeholders also suggested that the initiative should be expanded further to support the national vision of creating a sustainable society. In 2020, four UAE nationals were awarded ENOC Energy Scholarship – three were from ENOC and one was an external graduate.

Case Study

Youth empowerment in 2020

During the year, we successfully supervised the completion of three projects handled by three UAE National Energy Scholars. The efforts yielded potential for savings worth over AED 15 mn/year for the Group and will be implemented by various segments and BUs (STP/Dugas, Retail/Operations, HTL/HETL).

Insights into Projects

Energy and Resource Consumption Modelling and Optimisation in a Chemical Storage Terminal

With an increase in the cost of energy production, and organisations being held responsible for the impact they have on the environment and society, optimising energy consumption has become a major priority. In line with this, the project aimed to identify and analyse the major energy consumption in a chemical storage terminal and developed a model to optimise energy consumption. This project will contribute towards distributing energy consumption across sinks and understanding the consumption pattern of energy generation across different sources of the plant. The analysis conducted will help in identifying replacement, modification, up-gradation, and commissioning strategies at the machinery level across the plant while providing sustainable practices and recommendations for meeting our energy targets over time.

Ahmad Salah Bin Zaal

Benchmarking and techno-economic performance analysis of energy efficiency measures in the MTBE production facility

There are two methods to increase an industry's profit: increase production or decrease the cost of the manufacturing process. While expanding production is not the immediate goal of DUGAS and will need significant investment, the second alternative seems feasible. Due to rising energy prices and changing regulatory scenarios, enterprises are prioritising energy efficiency measures and upgrades. Firms in Dubai are attempting to address the competitive threat posed by rising energy prices by either negotiating a lower energy price from energy companies or engaging internally with energy-saving techniques. Aligned with this, the project aims to evaluate the energy consumption of DUGAS using statistical models, benchmarking, and identifying energy efficiency measures (EEMs).

The study will help us in developing a better understanding of energy usage in DUGAS, as well as the relationship between energy consumption, production, and the weather. As a result, technologically and economically proven EEMs can be proposed for implementation which result in cost savings.

Haatem AlRamsi

Optimising energy and resource consumption of petrol retail stations through performance benchmarking and prediction analysis

Petrol refill stations face threats and risks related to power usage and environmental concerns. Furthermore, the diversity of each station's services makes the comparison more difficult. In this instance, oil petrol refill stations can study and employ benchmarking measures. There appears to be a gap in forecasting in petrol refill stations since only a few to nearly none can be found about the usage of forecasting in the said industry with only a few journals that have investigated forecasting in the oil business. In line with this, the project aims to optimise energy and resource consumption of petrol retail stations through performance benchmarking and prediction analysis.

Utilising benchmarking and forecasting, this project will analyse and recommend measures to improve energy efficiency in retail stations and build models suitable for predicting future energy and resource consumption of the retail station. As a result, it will help petrol station managers and top executives to implement training and workshops for forecasting and even benchmarking in the workplace to shift towards more effective applications.

These projects are significant to our vision of creating a sustainable impact on society while progressing as a responsible organisation with a decreased carbon footprint.

Rehab Jasim Mohamed

ENOC compact stations

We aim to open 14 compact stations across Dubai. These compact petrol stations are relocatable with minimum write off assets and cater to residential and remote communities throughout the city. Through this initiative, we aim to meet the country's energy needs with smart, sustainable and safe fuelling solutions. With minimum capital investment, and above ground UL certified protected tanks for fuel storage, this a feasible solution for plots where underground storage is a constraint. Moreover, there is a 60% reduction in turnaround time for implementation compared to conventional stations.

Smart Features of the Compact Stations

- On-grid solar system
- High luminous efficacy LED lighting solutions
- Energy saving VRF HVAC solutions
- Waste management
- Programmable multilevel sensors lighting for energy conservation
- Vapour recovery stage-1 & stage-2
- Digital advertisement
- Water savings fixtures

Arabian Ranches Compact Station

This was the first relocatable unit set up by ENOC. With two pumps on site and a fuel tank set above ground, the relocatable unit can be dismantled and moved to a different location within 30 days, if needed. As the first such compact petrol station in the Middle East, it has a tank capacity to hold 30,000 litres of Special 95v and can fuel up to 400 cars per day. The decision to launch this kind of a community-convenient option to fuelling is a step towards creating ease for people living in areas where petrol stations are not easily accessible.

Dragon Mart Compact Station in Dubai

The compact station opened at Dragon Mart 2 earlier this month, designed to cater to residents living across nearby residential communities like International City as well as visitors to Dragon Mart.

It is equipped with eight dispensers, allowing for fuelling on both sides of the station, offering Special 95, Super 98 and Diesel, and a vending machine. With a capacity of 90,000 litres, the compact station will be able to fuel 1,200 vehicles per day. Equipped with solar photovoltaic (PV) panels, the station will deploy technologies that contribute to enhancing energy efficiency, such as the Vapour Recovery System – a process that enables the recovery of 70% gasoline vapour emissions. Additionally, the station is designed with a fuel tank set up above the ground, facilitating ease of set up and re-assembly if required.

DAFZA Compact Station

The station is designed to cater to the fuelling needs of the entire DAFZA region where major logistics offices are located. It is equipped with eight dispensers, allowing for fuelling on both sides of the station, offering Special 95, Super 98 and Diesel, and a vending machine. With a capacity of 90,000 litres, the compact station will be able to fuel 1,200 vehicles per day. The DAFZA compact station also includes a smart vending machine, launched in partnership with Etisalat and the Group's logistics partner, Mohebi. The vending machine is linked to a back-system that automatically sends triggers for refills and deliveries.

Acknowledgement

With this, the 4th edition of ENOC's 2021 Energy and Efficiency Report has come to a conclusion. Through this report, we would like to evoke a message of how ENOC is placed in this new world, helping shape and achieve the UAE's vision and ambitions.

Since starting on ENOC's Energy and Resource Management (E&RM) journey 14 years ago, our efforts have helped us significantly reduce our operating costs and avoid tonnes of carbon emissions. As a result of the combined efforts of our stakeholders and workers, we have indeed come a long way. We would want to take this opportunity to thank everyone for their dedication and hard work.

The 4th edition of this report is proof of our E&RM accomplishments throughout the years, which are demonstrated by our overall financial and environmental savings. We believe that by implementing energy-saving measures throughout our whole value chain, we are generating long-term value for ENOC on both a global and local scale.

Eng. Alia Ali Busamra,
Chief Sustainability Officer

List of abbreviations

Particulars	
AC	Air Conditioning
ACP Sheets	Aluminium Composite Panel
AED	United Arab Emirates Dirham
AI	Artificial Intelligence
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
B2B	Business-to-business
B2C	Business-to-consumers
BEC	Business Ethics Committee
BP	Business Plan
BU	Business Unit
CAS	Carbon Abatement Strategy
CEO	Chief Executive Officer
CNG	Compressed Natural Gas
CO	Carbon Oxides
CSO	Chief Sustainability Officer
CSR	Corporate Social Responsibility
DAFZA	Dubai Airport Freezone Authority
DBT	Dry-bulb Temperature
DEWA	Dubai Electricity & Water Authority
DIES	Dubai Integrated Energy Strategy
DLPP	Dubai Lubricants Processing Plant
DSCE	Dubai Supreme Council of Energy
DSM	Dubai Demand Side Management Strategy
DUGAS	Dubai Natural Gas Company Limited
E&RM	Energy and Resource Management
EEM	Energy Efficiency Measures
ELOMP	ENOC Lubricants and Grease Manufacturing Plant LLC
EMGAS	Emirates Gas LLC
ENOC	Emirates National Oil Company Group
EPCL	ENOC Processing Company
EPPCO	Emirates Petroleum Products Company, LLC
ESCO	Energy Service Companies
ETFE	Ethylene Tetrafluoroethylene
GHG	Greenhouse Gas Emission
GPP	Green Public Procurement
GSD	Group Sustainability Department

Particulars	
GS	Group Sustainability
HETL	Horizon Emirates Terminals Limited
HTL	Horizon Terminals Limited
HTTSA	Horizon Tangier Terminals Ltd
HVAC	Heating Ventilation and Cooling
IRR	Internal Rate of Return
ISO	International Organisation for Standardisation
ITP	Inspection & Test Plan
KPI	Key Performance Indicator
kWh	Kilo Watt Hour
LED	Light-emitting Diode
LEED	Leadership in Energy and Environmental Design
MMBTU	Metric Million British Thermal Unit
MoU	Memorandum of Understanding
NOx	Nitrogen Oxides
NPS	Net Promoter Score
OCIMF	Oil Companies International Marine Forum
OPEX	Operating Expenditures
PPM	Parts Per Million
PV	Photo Voltaic
RE	Renewable Energy
RFID	Radio-Frequency Identification
RTA	Roads and Transport Authority
SAP S/4HANA ERP	Systems, Applications & Products in Data Processing/ High-performance ANalytic Appliance
SDGs	Sustainable Development Goals
SEP	Superior Energy Performance
SEU	Significant Energy Use
SMART	Specific, Measurable, Achievable, Realistic, and Timely
SO2	Sulphur Oxides
STP	Sewage Treatment Plants
UAE	United Arab Emirates
USGBC	US Green Building Council
UV	Ultraviolet
VOC	Volatile Organic Compounds
VRF	Variable Refrigerant Flow
WLPGA	World LPG Association

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The 4th edition of ENOC's Energy and Efficiency Report is produced from sustainable paper products.
The wood and paper products used for producing this report come from renewable materials and/or well-managed forests.

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