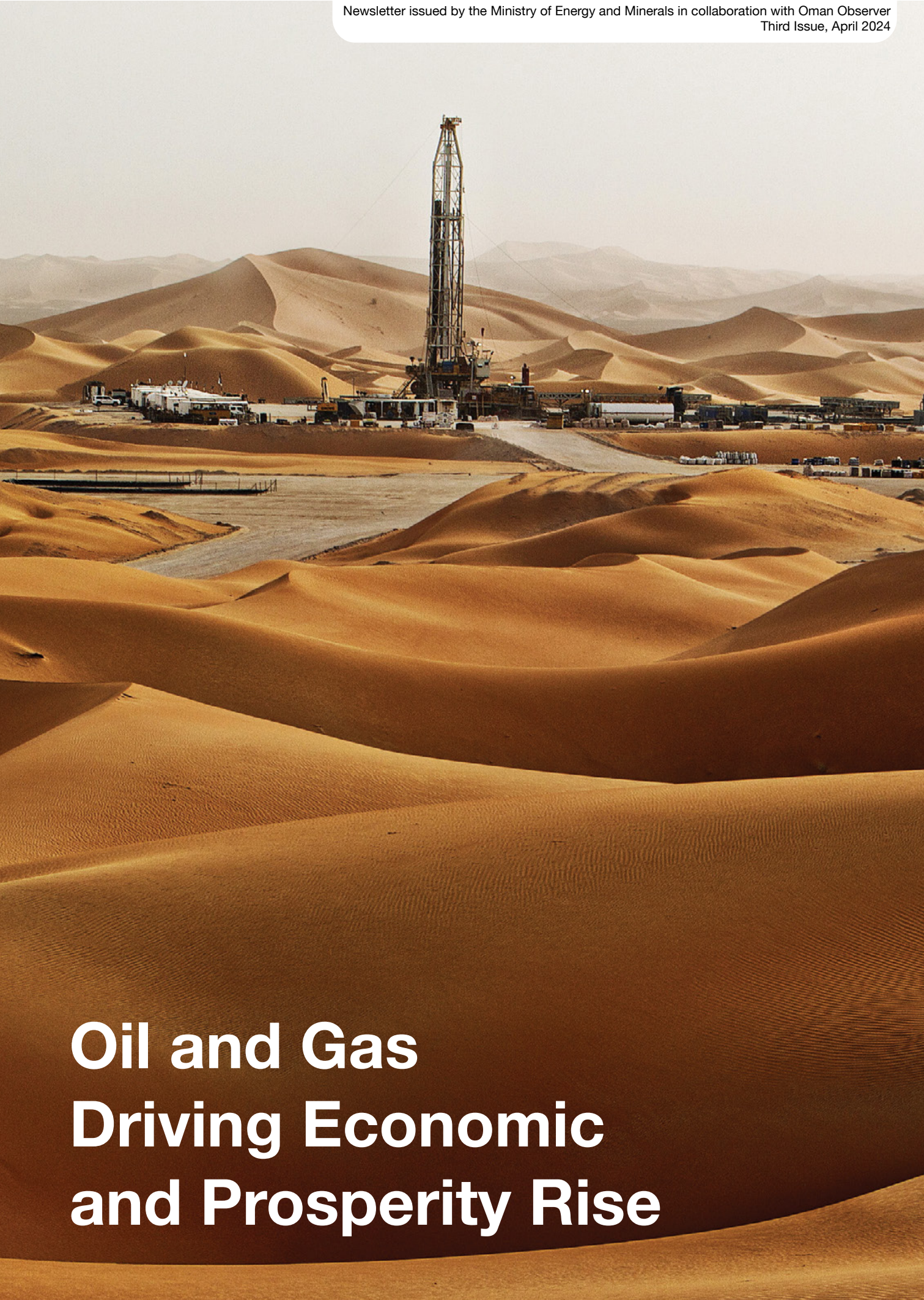


WEALTH

Newsletter issued by the Ministry of Energy and Minerals in collaboration with Oman Observer
Third Issue, April 2024



**Oil and Gas
Driving Economic
and Prosperity Rise**

Oman Petroleum & Energy Show

Oman Petroleum & Energy Show, under the patronage of Ministry of Energy and Minerals, is a platform that brings together Petroleum and Energy professionals from around the world, highlighting the most important developments in the energy sector. It serves as a catalyst for the exchange of knowledge, expertise and innovations in the energy sector to support sustainable development efforts in line with Oman’s Vision 2040, and establishes Oman’s position as a leader in carbon reduction efforts and sustainability in the energy sector.

Conference Goals

Drive business development, attract investments and exchange knowledge

Showcase the latest products and technologies in the energy industry

Explore new business partnerships and establish professional connections

Main Events

Society of Petroleum Engineers Conference (SPE)

OPES Exhibition

OPES Talks



Energy: Powering the Global Economy for a Sustainable Future

HE Eng. Salim Al Aufi
Minister of Energy and Minerals

The Oil and Gas Industry plays a pivotal role in the global economy, and in Oman, it stands as one of the most crucial economic pillars. Its contribution to the country’s GDP reaches a remarkable 72%, making it a significant force in driving sustainable development.

Significance of the Oil and Gas Industry in Oman:

The oil and gas industry plays a pivotal role in empowering and driving economic growth in Oman, fostering development stability, and providing the necessary resources to finance multiple government programs on both short and long-term levels. The industry also holds immense importance in infrastructure development through its investments in development projects and contributions to enhancing the country’s infrastructure and elevating the living standards and social well-being.

The oil and gas industry serves as a beacon of employment opportunities for Omani citizens, with a remarkable 90% Omanization rate among its operating companies. This unwavering commitment to national talent reflects the industry ‘s dedication to empowering Omani individuals and contributing to the nation’s human capital development. Recognizing the crucial role of SMEs in driving economic diversification and job creation, the oil and gas industry actively supports and promotes SME growth. By allocating a significant amount of its procurement spending, approximately 16% of the total value of purchases and tenders, to SMEs, the industry empowers these businesses to thrive and contribute to the nation’s economic vitality.

Recent Developments

Currently the world transitions towards a more sustainable energy landscape. While renewable energy sources are gaining traction, oil and gas remain a crucial component of the global energy mix. To ensure its long-term viability, the industry must embrace innovation and sustainability, prioritizing environment. Technology contributes significantly to the future of the oil and gas industry by improving extraction, exploration, and manufacturing processes, which is why we constantly urge our partners to innovate and develop new technologies in order to maintain competitiveness and achieve production sustainability. Sustainability and environment are paramount to achieving sustainable development in the oil and gas industry. As the

world transitions towards a more sustainable energy landscape, the industry must adopt practices and measures that minimize its carbon emissions and develop clean production technologies.

Investing in Exploration and Enhancing Reserves

Despite the growing momentum towards renewable energy sources, the demand for oil and gas remains robust and is expected to persist in the coming years. Recognizing this enduring need, we are committed to strengthening our investments in exploration and development, leveraging cutting-edge technologies to enhance our oil and gas reserves. By the end of 2023, our oil reserves had increased by 1%, reaching 4,971.1 million barrels, while Oman’s estimated natural gas reserves stood at approximately 23.1 trillion cubic feet at the end of 2023.

Local Content

We are unwavering in our commitment to enhancing the local content in the oil and gas industry, recognizing its vital role in localizing industries and fostering economic growth. By prioritizing the local content, we aim to strengthen the industry ‘s contribution to Oman’s overall economic ecosystem and support the growth of ancillary industries. In a significant step towards fostering the local content, we have approved the establishment of a chemical manufacturing facility that adheres to the highest standards and specifications. This project will directly contribute to enhancing the local content and reducing operational costs. Marking a technological milestone, we have successfully completed the construction of Oman’s first domestically manufactured electronic drilling rig. This innovative equipment, built using cutting-edge technologies, will ensure safe, efficient, and sustainable drilling operations.

The oil and gas industry remains a vital pillar of the global economy, playing an indispensable role in meeting the world’s energy needs. As such, investment opportunities in this industry will continue to attract significant interest, offering the potential for sustainable returns. To maximize the potential of the oil and gas industry while navigating the evolving global energy landscape, we advocate for a diversified and integrated investment strategies encompassing adaptability to energy transitions, environmental stewardship, and social responsibility.

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collaboration with Oman Observer

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Oil and Gas Navigating Oman's Economic Landscape



HE Dr. Said Al Saqri
Minister of Economy

The oil and gas sector is the major driver of the Omani economy. In fact, in 1972, oil activities was about 54% of the gross domestic product (GDP) of the Omani economy, and during the past five decades, oil activities contributed to the Omani economy achieving stable growth rates of 3%.

Although the government has begun to focus on economic diversification since the first five-year development plan, oil activities continue to play its pivotal role in the GDP structure. Then, the average contribution of the oil sector to the GDP was about 68% in 1970, and declined to about 48% in 2000 before rising again to about 53% in 2014. By the end of the third quarter of 2023, this contribution declined to about 33.64% compared to the current prices.

The oil sector is a major driver of several other economic sectors, which has led to the generation of more job opportunities and has contributed significantly to overall government revenues. The government uses oil revenues to support major strategic projects such as infrastructure projects, basic services, education, and health. The private sector operating in the oil and gas fields is also an essential partner in achieving development through production activities and social responsibility. Oil production companies contribute to the local growth, economic development programs and the development of national competencies.

Moreover, the sector contributed to the establishment of other related industries, such as petroleum derivatives and other chemical products, which in turn stimulated the development of heavy industries and enhanced the contribution of the manufacturing sector to the GDP through the successive five-year development plans.

However, there are several factors contributing today to the need to reconsider the oil and gas sector as economy driver, including: environmental commitments and the transition towards Net Zero by 2050, which requires the need to diversify the Omani economy by focusing on other sectors that depend on the comparative advantages that Oman enjoys.

The Net Zero plan approved by the Sultanate of Oman is a national action map for all concerned sectors to work to reduce harmful emissions, quality of life and sustainability.

It is expected that there will be an economic cost for this transformation, and we are currently analyzing and understanding this cost in cooperation with relevant parties and with the participation of international experts. However, we believe that the current global developments in emission reduction technologies and innovations in the field of carbon recovery and recycling, in addition to the transition to economic alternatives such as electric cars and innovations also in oil extraction activity in this field are very important for achieving Net Zero.

Our estimates are based on mobilizing efforts at the sector level, identifying the expected roles of the private sector in this transition, while focusing on distributing the costs of this transition in a way that contributes to making it economically successful while preserving the environment and the vital resources. Within the framework of this transition, we activate research, development and innovation activity in the areas of sustainability and carbon neutrality, which is an essential role for the academic sector and the private sector, in addition to relevant government institutions. We also believe that this transition will encourage investment in innovative educational fields based on sustainability concepts, which will contribute to creating new job opportunities and promoting faster economic diversification.

Exploring Off-shore Oil's Promising Frontier

HE. Mohsin Al Hadhrami
Undersecretary
Ministry of Energy and Minerals



Offshore oil has emerged as a burgeoning frontier in the energy landscape, driven by technological advancements and innovation that have expanded the range of methods for extracting oil from the seabed. Vast marine areas hold immense potential for exploration and the production of substantial quantities of oil and gas. Sophisticated offshore drilling techniques now enable exploration in extremely deep underwater zones, considerably improving the chances of discovering new oil and gas reserves.

As global energy demand continues to rise, offshore oil extraction emerges as a promising and opportunity-rich frontier, poised to become a cornerstone of the future global energy landscape. With varying degrees of reliance on offshore oil extraction, countries like Oman are at the forefront of this endeavor, leveraging their expertise and specialized technologies to harness the vast energy potential beneath the seabed. Oman boasts a rich history of offshore oil exploration and production, utilizing cutting-edge techniques and specialized equipment to extract and refine crude oil. Offshore production platforms serve as the primary hubs for processing and refining the extracted crude oil, enabling its efficient transportation to shore via pipelines or tankers.

Offshore oil development and utilization stand as a strategic imperative for Oman, playing a crucial role in maintaining oil production, enhancing the nation's production capacity, and securing a stable supply of energy both domestically and internationally. Oman possesses a network of offshore oil extraction platforms, and we are actively expanding our utilization of these resources to protect reserves and assure long-term supply by leveraging on technological advances to raise production, improve process efficiency, and develop exploration. With our industry partners, we aspire to develop offshore oil platforms and strengthen the infrastruc-

ture required for efficient oil extraction and transportation. Offshore platforms are critical components of marine oil production operations, providing a sturdy and safe basis for conducting drilling and production activities in the frequently harsh environment of seas and oceans. Given the nature of Oman's oil-producing offshore fields, all of which are located in shallow waters no deeper than 100 meters, the country's offshore production platforms are entirely fixed platforms, constructed and anchored to the seabed with corrosion-resistant reinforced concrete.

Oman's offshore oil production relies on a network of three strategically located platforms, each playing a crucial role in extracting and transporting oil resources. The Bukha platform and the West Bukha platform are both located in Concession 8, within the Arabian Gulf near the entrance to the Strait of Hormuz, with the Bukha platform 13 km off Musandam Governorate's shore. The West Bukha platform is located 17 km northwest of the Bukha platform, close to the Omani-Iranian maritime border. The third platform is the Yumna Field platform, located in Concession 50 in the Arabian Sea, 40 km northwest of the Port of Duqm and near Masirah Island. The Ministry of Energy and Minerals has also approved several initiatives focusing on maintenance operations and drilling new wells to maintain and boost production on all offshore production platforms.

As the world's energy demands continue to rise and technological advancements reshape the landscape, offshore oil extraction is poised to become an increasingly dynamic and innovative industry. Driven by a growing focus on sustainability and environmental protection, the future of offshore oil extraction is expected to witness groundbreaking developments that improve efficiency, minimize environmental impact, and expand the frontiers of exploration.



1994	2009	2020
Bukha platform Operation has begun to produce non-associated gas and condensates from Bukha gas field.	West Bukha platform Operation has begun to produce non-associated gas and condensates from Bukha gas field.	West Bukha platform The platform began operating to produce oil from the Yumna oil field, with the total quantities produced so far reaching about 8 million barrels.



Positioning Oman LNG in Global Map



Eng. Hamad Al Naamany
CEO of Oman LNG



Oman LNG was Founded in 1994 following a Royal Decree issued by the late His Majesty Sultan Qaboos bin Said with 2 LNG production facilities and Qalhat LNG followed in 2004 through a separate Royal Decree adding 1 additional LNG production train. Oman LNG is the operator of the combined LNG facility and a renowned joint venture that is better known for producing, marketing and delivering Oman's Liquefied Natural Gas (LNG) to customers around the globe.

With a world-class Plant Complex in Sur, the company enhanced nameplate capacity to more than 11.4 million metric tonnes per annum. In 2023, its production rate stood at 11.5 million metric tonnes per annum, exceeding the enhanced nameplate capacity.

Since inception, the company spared no effort to prioritise the safety and reliability of its operation, staff development and business partners capability building supported by well-established programmes for the community and the environmental integration.

Oman LNG has become part of the Hy Fly National Hydrogen Alliance which intends to establish hydrogen clusters and contribute to a greener future. The company's membership in the Oil and Gas Methane Partnership 2.0 underscores Oman LNG's commitment to sustainability and methane emission reduction and adds a significant value to our commitment to sustainability management and methane emissions reduction.

On the other hand, the company's reputation for supplying reliable energy to key markets around the globe has helped establish the Sultanate of Oman's footprint in the global energy trade and formed a strategic economic partnerships with various countries.

Furthermore, Oman LNG has successfully adapted to the shifts in the energy market, to capture growing LNG demand, improve efficiency through multiple technical improvements, and increase value through optimisations, diversions, and spots in the marketing and trade of LNG.

Our commitment to foster partnerships with energy firms has facilitated the way to sign multiple term sheet agreements to deliver a total of 10.4 million metric tonnes per annum of LNG as of 2025. Through these agreements, the company leverages its strong presence in the market and its partnerships to further position LNG from Oman and ensure value added growth for the upcoming decade.

Embracing Clean and Sustainable Oil and Gas Energy

Dr. Saleh A Al Anboori

DG of Exploration and Production of Oil & Gas



Since its inception in the oil and gas industry, the Sultanate of Oman has demonstrated a steadfast commitment to environmental protection and sustainability, prioritizing these principles as integral components of its operations.

Oman has implemented a range of sustainable initiatives and enacted comprehensive environmental legislations aimed at preserving the environment, demonstrating its commitment to developing the oil and gas industry in a safe and sustainable manner. These regulations covered a wide range of environmental issues, including protecting groundwater wells while drilling was underway and safeguarding the surroundings of oil production sites.

Realizing how urgent it is to address climate change, the Sultanate of Oman has embarked on a remarkable journey to achieve net zero emissions by 2050. Oman has entered into state agreements specializing in clean energy, in addition to implementing new projects and modern technologies that serve and contribute to reducing environmental impacts. This ambitious goal is not merely a promise; it is a testament to the country's unwavering commitment to achieving global goals for reducing carbon emissions and contributing to efforts to combat climate change.

The Ministry of Energy and Minerals, through the Directorate General of Exploration and Production of Oil and Gas, is making unrelenting efforts to achieve the goals set for the net zero strategy in the oil and gas industry. These goals are to reduce carbon emissions in the oil and gas industry by 7% by 2030, compared to the 2021 baseline, promote investment in clean energy projects, and encourage companies to adopt modern technologies that contribute to the production of clean and sustainable energy.

The most prominent of these efforts is the signing of a number of international initiatives and programs concerned with reducing emissions from the industry, which are as follows:

- The World Bank's "Zero Routine Flaring by 2030" initiative. The Ministry has developed a comprehensive action plan, setting December 2027 as the deadline for ending routine flaring operations in Oman's oil and gas fields. All companies operating in the industry have demonstrated their commitment to this plan and are actively working towards its implementation.
- The Global Methane Pledge initiative aimed at reducing methane emissions by at least 30% by 2030 from 2020 levels. To fulfill its commitment to the Global Methane Pledge, Oman is collaborating with the United Nations Environment Programme (UNEP), the lead implementing body for the initiative. In 2023, the Methane Alert and Response System (MARS) was activated. This initiative, which emerged from

the United Nations Environment Programme and its partners, uses satellite data, artificial intelligence, and other advanced technologies to identify methane emissions from oil and gas facilities, enabling operators to take prompt action to mitigate these emissions.

In addition to its participation in international initiatives, the Ministry is implementing a comprehensive range of domestic measures in cooperation with companies operating in the oil and gas industry, the most important of which are:

- Clean Energy Projects: the Ministry has actively supported the development of renewable energy projects within the oil and gas industry. This includes solar and wind power plants constructed by oil and gas companies, as well as the utilization of solar-powered streetlights in concession areas and residential camps.
- Energy Efficiency improvement Initiatives: Oman is committed to minimizing energy waste. This includes promoting the use of energy-efficient electrical appliances, upgrading open-cycle turbines to more efficient closed-cycle (combined) turbines, which can reduce fuel consumption efficiency by up to 50%.
- Electrification of Oil Fields Projects: Oil and gas companies are actively transitioning away from diesel-powered generators and connecting their oil fields to the national electricity grid. This shift is driven by the fact that grid-supplied power has much lower emissions than diesel generators.
- Carbon Capture, Utilization, and Storage (CCUS) Projects: Companies operating in the industry have carried out many studies and experiments in this field with the goal of preventing emissions from entering the atmosphere so that the captured gases can be used to improve oil production or be permanently stored underground.
- Blue Hydrogen Project Feasibility Study in Duqm in cooperation with Shell.
- Afforestation of Oil Fields and thus reduce the percentage of carbon in the air.

Oman's pivotal role in the oil and gas industry is inextricably linked to its unwavering dedication to achieving national sustainability goals and actively contributing to the transition towards clean energy sources. The close collaboration between the Ministry of Energy and Minerals and oil and gas operators stands as a testament to the nation's ambitious vision of achieving net zero emissions. This exemplary partnership elevates Oman's position as a beacon of sustainable development and environmental responsibility, both domestically and globally.

Production With A Purpose



To support His Majesty Sultan Haitham bin Tarik's commitment to diversify the economy as laid out in Oman Vision 2040 while achieving net-zero emissions (NZE) by 2050, PDO has unveiled a new purpose of "building a sustainable and low-carbon future to maximise value for Oman."

Steve Phimister

Managing Director of
Petroleum Development Oman



This PDO Purpose aims at our part in solving the trilemma of energy affordability, security and sustainability for the Sultanate of Oman; underpinning the Purpose is a refreshed PDO Strategy, with Cost and Carbon competitive growth at its heart.

In practice, this means growing our core oil and gas business to reach a production plateau of beyond 700,000 barrels per day while also drastically reducing our carbon footprint.

The first aim necessitates accelerated projects and volume maturation, the development of stranded assets, enhanced oil recovery and a push to cut unscheduled deferment to less than 5% in our oil assets by improving artificial lift reliability and implementing tech-enabled availability and maintenance improvements.

This approach helped us to generate US\$22 in revenues from increased liquids production for the nation last year, an achievement supported by the record delivery of 884 new wells and a portfolio unit operating cost (UOC) of just US\$6.2 per barrel of oil equivalent.

PDO has top quartile performance across many of its operational excellence metrics relative to current trends, but we see opportunities to continue improving our business and we aim to reduce UOC to below US\$6 by 2030 through our Cost Competitiveness strategic pillar.

In terms of emissions reduction, we are making good progress against our Carbon Reduction Roadmap, which sets out a clear pathway to reach NZE while organically diversifying our revenue generating options away from a predominant reliance on hydrocarbons – in doing so we remain fully aligned with the Sultanate's

objectives and plans.

Over the last three years, we have systematically reduced gas flaring by nearly 50% and we will achieve the target of World Bank initiative of Zero Routine Flaring by 2030. In 2023, PDO emitted approximately 10 million tonnes of carbon dioxide equivalent (roughly 10% of Oman's total CO₂e emissions) and we are investing each year to reduce our emissions in-line with Oman's NDC and even beyond, in a value-adding manner.

More than 60% of PDO's GHG emissions result from gas-fired power generation and so we've set a target to obtain 50% of our power requirements from renewables by the end of the decade. To achieve this, we are investing in a further 300 MW of wind and solar generation, building on the success of our existing 100 MW solar power project at Amin in southern Oman, which is harnessing the sun's energy to provide "clean" electricity for our Interior operations.

Another standout achievement for us has been the inception of the first Concentrated Solar Power (CSP) project in Oman, known as Miraah. This innovative project aims at harnessing solar energy to produce steam for operational needs. Not only does Miraah demonstrate our commitment to sustainable energy solutions but also sets a precedent for renewable energy adoption in the region.

We have also launched a comprehensive Methane leak detection and repair programme using a combination of satellite, drone and infrared imaging technology so that we achieve near-zero target by 2030. We have adopted a "find small, fix small" philosophy and since 2021, we have eliminated around 483,000 tonne CO₂ equivalent

of Methane emissions through leak fixing, ensuring that PDO reached a Methane intensity performance of less than 0.20%.

Another challenge is how to deal with produced water from our oilfield operations, as we currently produce around 10 barrels of water for every barrel of oil. To address this issue, we have pioneered a number of technologies to reduce the volume of water coming to the surface and also phasing-out high-energy water disposal techniques. Our response to the challenge includes nature-based solutions, such as the Rima Water Treatment Plant (following in the footsteps of the award-winning Nimr Reed Beds project), using gravitational oil and water separation and natural biological treatment, a first for Oman.

The facility is capable of processing up to 65,000 cubic metres of water a day, cutting high-energy consumption by 10 megawatts and GHG emissions by 53,000 tonnes a year. This innovative solution not only ensures the effective treatment of the water but also creates a desert oasis for local wildlife.

We are also actively looking at how we can deploy more cutting-edge technology in our operations, such as carbon capture utilisation and storage (CCUS), and we are currently running a trial to use carbon dioxide in enhanced oil recovery – this will increase oil production whilst reducing CO₂ emissions from our operations, all in an economically viable manner.

These achievements, alongside a myriad of projects and investments to enhance energy-efficiency of PDO's core operations, underscore our ongoing dedication to sus-

tainability and serve as a testament to our leadership in driving positive change within the energy sector.

PDO has long been proactive in transparency and accountability, issuing sustainability reports since 2014, a measure of our dedication to measuring and improving our environmental and social impacts.

It's important to state that we will only deliver on our mandate to navigate the Energy Transition in an orderly fashion by rationalising and simplifying our operating model – our structures, systems and processes – encompassing all our value chains from contracting and procurement through hydrocarbon maturation to oil export and digital oil field practices.

We are also actively moving to a new cultural and commercial mindset, on in which our staff are empowered to take decisions at the right place in the organisation, whilst fully embracing collaboration with contractors, teamwork, discipline, excellence, safety and ethics as core values.

Our industry is changing and so our people's work scopes and ways of working must change too. This demands big investments in talent development and tech-enabled productivity to achieve our goal of serving Oman and all our stakeholders.

This will be a long journey with many obstacles to overcome but – through the changes we have made to our Purpose, our Strategy, our Operating Model and our Culture – I am confident we have the foundations and framework in place to continue proudly serving Oman.

OXY Oman: Leading the Way to Sustainable Pro- duction Innovations

Oxy Oman is a wholly owned subsidiary of Occidental (Oxy), an international energy company. Oxy has been operating in Oman for 40 years, where it has steadily increased hydrocarbons production and reserves and is honored to partner with the Government of Oman. In the pursuit for sustainable energy solutions, innovation serves as the driving force pushing the energy sector towards a greener and more efficient future. Oxy Oman is at the forefront of transformative endeavors, from its legacy world-class steamflood project to newer carbon utilization initiatives and integrating artificial intelligence (AI) technologies – these groundbreaking initiatives exemplify Oxy Oman's pathway to energy transformation through innovation.



Mukhaizna Steamflood - Engineering Excellence

Oxy Oman has implemented a groundbreaking approach in the Mukhaizna heavy oil field, situated in south-central Oman, and one of the world's largest steamflood projects. This approach involves continuously injecting steam into select wells to heat the oil reservoir, thereby reducing viscosity and boosting flow rates and recovery factors. The reservoir's layered structure necessitated a unique strategy: horizontal producers target specific layers while vertical steam injectors service all layers, with infill vertical producers drilled between to reach unswept spots. This combination of vertical and horizontal wells ensures high initial oil yield and rapid production growth without compromising recovery.

To optimize operations, Oxy Oman has employed advanced technologies, such as one of the world's largest Mechanical Vapor Compression units, heat recovery units and specialized high-temperature equipment. Real-time monitoring systems and automated tools maintain performance and safety standards, in addition to supporting over 3,500 drilled wells with extensive surface facilities, including oil dehydration and water desalination plants, steam generation units, and a vast network of flowlines.

To support monitoring and surveillance, Oxy Oman teams also utilize geological modeling and thermal reservoir simulation to analyze complex dynamics and plan future developments at the field. In addition, the company has automated monitoring tools that provide instant insights into the performance of equipment, wells, and the field, that flag deviations from expected trends.

The Mukhaizna field operations exemplify Oxy Oman's drive to enhance reservoir potential and operational efficiency and produce energy for the Sultanate. Oxy Oman

has developed a full-field data analytics model in-house to optimize steam usage across thermal acreages, leveraging machine learning and high-performance computing. Implementation of this model has led to improved steam utilization, production trends, and workflow agility, enhancing adaptation to operational variables.

Overall, Oxy Oman's proactive approach in the Mukhaizna field demonstrates how advanced technology and data-driven approaches can optimize heavy oil production while ensuring safety and environmental integrity.

CO2 EOR Pilot – A Step Towards Net Zero

Oxy Oman has initiated a groundbreaking pilot project for enhanced oil recovery (EOR) using CO2 in its Oman North block. This marks a major step towards net-zero growth and is aligned with the Sultanate's target of achieving net-zero carbon emissions by 2050. Oxy has decades of global expertise in enhanced oil recovery and integrated carbon management operations, and is leading this project in the Safah field, with the dual objectives of optimizing oil recovery through CO2 injection and advancing Carbon Capture, Utilization, and Storage (CCUS) strategies in Oman.

This initiative began with thorough extensive technical research and project assessment, stemming from a comprehensive evaluation of Oxy Oman's mature waterflooding assets in northern Oman. The evaluation identified favorable rock and fluid properties, suggesting the potential for CO2-based enhanced oil recovery.

The pilot project aims to inject CO2 over a two-year period. By leveraging significant reserves in the subsurface, the pilot project sets the stage for a substantial CO2 EOR initiative within Oxy Oman's concession area, using captured CO2 in future operations.

Additionally, Oxy Oman and OQGN announced the signing

of an MoU in 2013 to jointly study potential CCUS projects in Oman, alongside the signing for the CCUS and Blue Hydrogen Policy & Regulatory Framework Terms of Reference (CCUS TOR) with the Ministry of Energy and Minerals.

Oxy Oman's pilot program underscores the company's dedication to innovation in CCUS technology deployment and future EOR projects in Oman, in line with the Omani government's long-term Net Zero strategy and global climate objectives. As part of its global strategy, Oxy Oman is actively investing in EOR using captured CO2 and other cutting-edge technologies as well as business solutions in carbon management.

Artificial Intelligence and Technological Innovation

Looking towards the future, Oxy Oman is leveraging Artificial Intelligence (AI) technology to drive innovation across its operations. With AI's multifaceted impact on energy transition, the company is looking towards advances in AI tools to improve operational efficiency, cut costs, and minimize environmental footprint in line with sustainable energy practices.

To achieve these goals, Oxy Oman initiated a comprehensive AI adoption strategy. This involved forming a cross-functional task force drawn from various parts of the organization. Additionally, the company has implemented an enterprise-wide AI education program to ensure all employees can effectively leverage AI technologies.

Oxy Oman's notable achievements in existing AI applications like Machine Learning include developing the Oxy Oman Field Optimization System (OFO). OFO optimizes steam-flood operations across extensive thermal acreages, resulting in improved reservoir performance and maximized returns on oil recovery projects. Additionally, the company is exploring Generative AI for collaboration and productivity

platforms to streamline operations.

In the United States, Oxy is also building the world's largest Direct Air Capture (DAC) facility to support global decarbonization and create a pathway to achieve net-zero climate targets. Once fully operational, the facility from Oxy subsidiary 1PointFive will be the largest DAC facility in the world.

Designed to remove up to 500,000 tonnes of CO2 annually, the technology behind these facilities, developed by Oxy subsidiary Carbon Engineering, allows for continuous operation to achieve industrial-scale carbon removal. They can be built with existing equipment, leveraging existing supply chains, and supporting corporations and governments globally as a tool to help achieve global climate targets.

In the rapidly evolving technology landscape, Oxy Oman remains dedicated to driving progress and seizing new opportunities. By comprehensively leveraging new technologies, the company seeks to enhance efficiency, fosters innovation, and maintains its drive for growth in the energy sector.

The Pathway to Sustainable Energy

In today's changing energy landscape, innovation plays a crucial role in promoting sustainability and energy transformation. Oxy Oman's highlight achievements are leading examples of efforts driving towards a net-zero future. These initiatives focus on utilizing engineering expertise, environmental responsibility, and technological advancements to ensure a sustainable energy trajectory. As society transitions towards cleaner energy sources, these initiatives provide valuable inspiration for progress. Oxy Oman seeks to spearhead collaborative efforts across the industry, aiming for a sustainable future for generations to come.

A Forward Prospective of Oil and Gas Production

The global oil and gas industry, particularly the oil industry, finds itself at a crossroads as it deals with geopolitical uncertainties, fluctuating economic trends, mounting climate pressures, and an unwavering demand for energy. Despite the push towards cleaner energy sources, oil and gas remain indispensable commodities, with recent OPEC reports projecting a surge in global oil demand from the current 100 million barrels per day (mb/d) to approximately 116 mb/d by 2045, driven primarily by the growing energy needs of developing nations in Asia and Africa.

The 28th Conference of the Parties (COP28) marked a pivotal moment in the global climate discourse, with a landmark agreement to phase out fossil fuels, and this is considered a historical precedent in the oil and gas industry. The cost of producing energy from renewable sources like solar and wind power continues to decline, driven by technological advancements and increased investments in research and development. Ongoing research and development in energy efficiency technologies will lead to reducing energy consumption across various industries, potentially mitigating the growth in energy demand.

Oman, like many oil-producing nations, faces a complex interplay of factors influencing the long-term sustainability of its oil and gas production. These challenges stem from both external and internal dynamics such as the aging infrastructure, increasing water production associated with oil, declining reservoir pressure and productivity. In response to the complex challenges facing the oil and gas industry, both globally and within Oman, the Ministry of Energy and Minerals has taken decisive action, in collaboration with industry partners to overcome these challenges.

The Ministry is paying a lot of effort aimed at reducing the carbon intensity produced with each oil barrel, which contributes to achieving the Sultanate's goal of Net Zero emissions by 2050, while striving to make Omani crude a strong competitor to other crudes in the face of any potential protective legislation and regulations by industrialized countries in the face of the oil and gas industry, such as special carbon taxes or other legislation aimed at mitigating the impact of fossil fuels on the climate.

In light of this, MEM has set an ambitious goal to eliminate routine gas flaring and reduce methane emissions by 30% by 2030, in line with global efforts to tackle climate change. The Ministry collaborates with its industry partners to assess the technical and economic viability of carbon capture and storage (CCS) in Oman's in deep rock formations as well as to increase electricity generation from solar and wind energy in oil fields to reduce the use of natural gas. MEM is always looking for new and cutting edge solutions to improve energy efficiency throughout the entire oil and gas production process.

In light of the projected increase in oil and gas demand from developing nations in the medium and long term, MEM, in collaboration with its industry partners, is taking proactive steps to ensure a sustainable and secure energy future for the Sultanate of Oman. With ongoing advancements in drilling and production operations, reservoir performance modeling, and artificial intelligence, machine learning and big data processing technology, the Ministry is investing more in exploration operations using the latest seismic survey techniques and processing large data. Over the past ten years and, hopefully, for the next ten, this has helped the Sultanate in maintaining a production capacity of over one million barrels of crude oil and condensate per day. It has also continued to increase the production of gas, which is essential for producing electricity and providing energy to industrial areas.

Oman's oil and gas industry is facing several external and internal challenges that must be carefully considered and addressed. The Ministry understands these issues and addressing them head-on, ensuring the sustainability and growth of Oman's oil and gas industry. MEM spares no effort in this regard through the aforementioned efforts, which have proven their effectiveness in sustaining and growing oil and gas production capacity.



Eng. Hamood Alsawafi

Director of Regulating
Oil Production

Unveiling Oman's Oil and Gas Reservoirs

Maram Al Belushi

Geologist

For nearly a century of exploration activities in Oman, the Ministry of Energy and Minerals in collaboration with the operators through a meticulous process of geological studies, utilizing 2D and 3D seismic surveys, subsurface technical evaluations, and exploratory drilling both onshore and offshore has gained a profound understanding of Oman's diverse geological landscape and geological plays fairway. The culmination of the exploration efforts has been the discovery of major reserves, and the continuous pursuit of new reserves can only be ensured by a sustainable exploration activities.

Oman's host an extensive geological landscape from the Precambrian Era (approximately 830 million old) to the Modern Era. The oldest units composed of igneous and metamorphic rocks that formed during the assembly of the Supercontinent Gondwana. Followed by deposition of units that varied between clastics, carbonates, salt and igneous rocks. Accompanied with tectonic events that formed major structures such as Ghaba, Fahud and South Oman Salt Basin and the associated faults and basins from north to south with the distinguished geology in Musandam and Salalah.

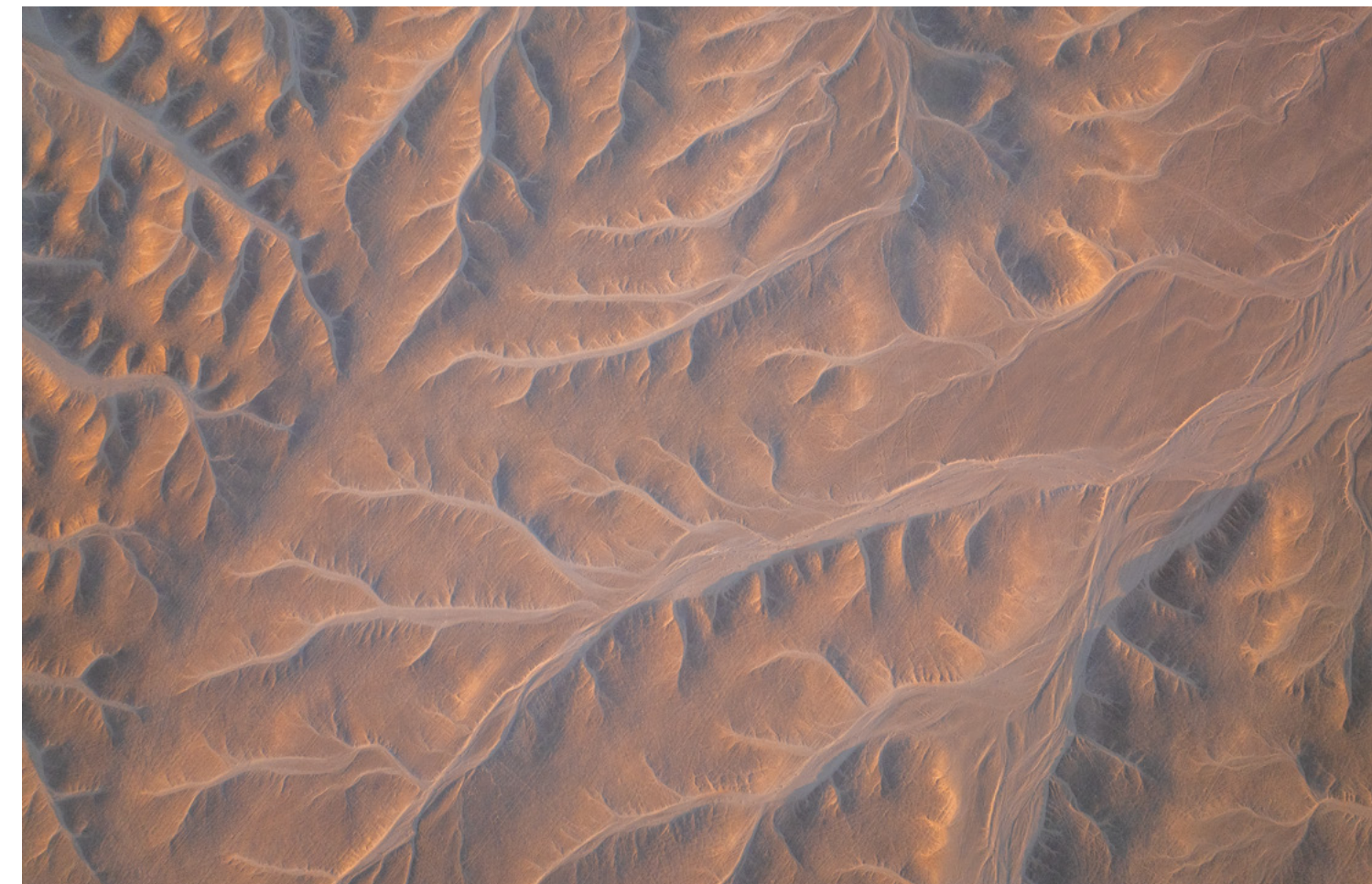
Oman's geology has played a pivotal role in attracting investors to embark on hydrocarbon exploration. The initial efforts to uncover Oman's hydrocarbon wealth were met with challenges in the fifties and the beginning of sixties. However, the continued exploration activities has lead to discovery of the giant Yibal field followed by Fahud and Natih fields in 1963 and 1964. Hence, Oman commenced as an oil producing country.

The Ministry along with its partners has achieved a considerable success as a result of the continued exploration activities. For example, in eastern Oman Block-3&4 the exploration efforts has continued since 1972 for 37 years by drilling around 27 wells that all resulted negative until 2009 where

an exploration well drilled relatively deeper and marked the first commercial exploration success in the Block in the oldest formations Buah and Khafi. And in the offshore Block-50 the exploration efforts continued since 1982 through a number through a number of operators until 2014 where the first commercial exploration was achieved in Aruma Group that used to be considered with low or limited potential. Lately, a number of discoveries were made in a younger formations like Umm Er Radhuma and Shammar that wasn't considered as a producing units.

The technical evaluation has developed using an advanced technologies especially in seismic processing and reservoir characterization to identify a complex drilling opportunities such as stratigraphic beside the conventional structural opportunities and in a thinner low relief reservoir. That has resulted in achieving a new commercial discoveries especially in the matured reservoirs such as Natih and Shuaiba. As well as the challenging intrasalt carbonate stringers being over-pressured and containing toxic gases which cause a drilling challenges. Nonetheless, the exploration has continued since the first discovery in 1976 until it became one of the major producing reservoirs.

Today, Oman produces from a number of geological formations that varies between clastic and carbonate. For example, Natih and Shuaiba are one of the important producing formations especially in north Oman, Gharif and Alkhata formations producing oil and gas in south and north Oman respectively and Barik, Miqrar and Amin are the most important gas producing reservoirs. Reservoirs in Oman have recorded hydrocarbon shows which offers exploration opportunities for investors that in turn ensures the continuity of exploration activity to ultimately sustain the local oil and gas production in the light achieving carbon neutrality.





OQ Group Maximizing Natural Wealth

OQ Refineries and Petroleum Industries (OQ RPI), an OQ Group company, has been at the forefront of maximising the utilisation of Oman's natural resources, meeting the country's demand for petroleum derivatives and exporting them to global markets. The company's journey dates back to the early 1980s. In 1982, Mina Al Fahal Refinery was established as the first crude oil refinery in Oman with a total feedstock capacity of 106,000 barrels per day. Over the years, Mina Al Fahal Refinery has played a crucial role in supporting the petrochemical industry and securing the country's need for petroleum derivatives. Subsequently, in 2006, Sohar Refinery commenced operations, becoming Oman's second refinery to cater to the growing demand for various petroleum products and export the surplus to international markets. The development in Oman's refining and petrochemical sector continued unabated, driven by the industry's global significance. In 2019, Sohar Refinery underwent a USD 2.6 billion expansion, increasing its production capacity by 62,000 barrels per day, bringing its total production capacity to 198,000 barrels per day.

Through OQ Group, the Omani government has furthered its mission to maximise Oman's natural resource value by collaborating with the State of Kuwait to establish Duqm Refinery (OQ8). This venture, backed by an investment of around USD 9 billion, stands as the largest investment partnership in the Gulf Cooperation Council (GCC), boasting a processing capacity of 230,000 barrels per day. This strategic move has significantly increased Oman's refining capacity to 534,000 barrels of oil per day, marking a major advancement in the region's petroleum industry and highlighting the government's strategic and economic commitment to the energy sector.

The development of Oman's refining and petrochemical sector has had a positive impact on increasing produc-

tion and contributing to adding value of the oil barrel through the production of various petroleum derivatives. Refineries in Oman processed 81 million barrels of crude oil. OQ Refineries and Petrochemicals plays a leading role in driving the country's transformation industries through its significant investments in numerous plants. These investments aim to add high value to oil resources and promote the establishment of small and medium-sized enterprises. OQ Polymer produces 300,000 tonnes per year of polypropylene and 880,000 tonnes per year of polyethylene, while the Aromatics plant produces 818,000 metric tonnes per year of paraxylene, 198,000 metric tonnes per year of benzene, 340,000 tonnes per year of polypropylene, and 304,000 tonnes per day of refining derivatives.

OQ has advanced its commitment by venturing into industries that utilise polymer products. In a strategic collaboration with Madayn (Public Establishment for Industrial Estates), Ladayn Polymer Park was established to catalyse investments in key sectors such as medical supplies, food packaging, and agricultural product manufacturing. This initiative has already seen the signing of nine agreements, channelling investments amounting to USD 80 million.

OQ RPI's products are marketed domestically and internationally through OQ Trading (OQT), exporting to over 80 countries and serving over 3,000 customers worldwide. This positions OQ RPI as a leading global energy company with a strong presence in international trade shows.

On the domestic front, OQ RPI is committed to enriching local markets and places a high value on In-Country Value through a legislative and executive framework that supports the national economy, strengthens SMEs

and promotes national industries. Statistics from the third quarter of 2023 indicate that OQ RPI spent USD 314 million locally on procurement from the local market, representing 69% of the total procurement value. Spending on SMEs amounted to USD 73 million, or 16% of total procurement, while spending on Riyadh cardholders reached USD 27.4 million. The company supports national industries by focusing its procurement on Omani products, which amounted to USD 64 million in the third quarter of 2023, or 14% of total procurement. The company consistently prioritises community partnership in its operations and investments, driven by a belief in the importance of supporting local communities. Financial data reveals that from 2011 to 2023, the value of social investment projects reached USD 33.516 million, distributed across three main initiatives. These include OQ Refineries and Petroleum Industries with an investment of USD 7.267 million, its projects with Sohar Aluminium valued at USD 3.835 million and joint ventures with Sohar Aluminium and Vale through the Jusoor Foundation totaling USD 22.4146 million. This investment underscores the company's dedication to social responsibility, supporting government and community initiatives aimed at improving the welfare and prosperity of the communities where it operates.

At the helm of OQ Refineries and Petroleum Industries' (OQ RPI) operations is a team of highly skilled individuals, both Omani and international, who are driving the transformation towards enhanced economic development in Oman. This team comprises approximately 2,540 employees working in various engineering, technical, administrative, financial, and commercial fields, with an Omanization rate of 81%. Over the past few years, the company has employed 1,813 graduates through its various recruitment programs and is committed to nurturing and training its talent. To date, the company has

trained over 4,000 individuals.

OQ RPI places great importance on health, safety, security and environment, recognising their significance for the well-being and safety of its employees. In 2023, the company recorded 14,748,979 work hours without any Lost Time Injuries (LTI). The company has made significant efforts in training its employees in occupational health and safety within the workplace, as part of its commitment to this area. Training hours amounted to 116,067, with 40 inspection tours to ensure compliance with health and safety standards, 71 training simulations and 11,018 work permit audits. The company has earned three ISO certifications: ISO 9001, ISO 14001, and ISO 45001.

OQ Refineries and Petroleum Industries is committed to sustainability, with a core focus on environmental conservation. The company's efforts in this domain include managing environmental impact and investing in biodiversity to mitigate environmental effects. The company also prioritises social aspects, aiming to enhance health, safety and social well-being for employees and contractors by promoting equal opportunities and fostering diversity and inclusion in the workplace. Moreover, OQ Refineries and Petroleum Industries places significant emphasis on economic and governance, striving to improve performance and innovate in alternative energy research and development, while upholding standards of integrity and transparency.

In conclusion, OQ Refineries and Petroleum Industries, an OQ Group company, is a major contributor to the national economy, driving economic activity, playing a crucial role in fueling the country's development, enhancing the industrial sector and boosting local value addition and community partnerships.

From Wells to Wins: Celebrating Oil and Gas Success

The oil and gas industry presents a unique and captivating career path, offering individuals a remarkable opportunity for professional development and stimulating competition. This dynamic environment is characterized by a blend of challenges and rewards. Despite all the challenges, successful role models have emerged in the oil and gas industry. The remarkable and varied professional experiences of these individuals are reflected in the successes they have made in their respective fields of expertise, as well as the valuable contribution Omani women provide to the development and growth of this industry.



Dr Ibrahim Al Saleh

Executive Director
Musandam Oil and Gas Company

Offshore field management presents an extraordinary and challenging professional experience, requiring a unique set of skills and specialized training to navigate the complexities of its unique working environment. Drawing from my experience at Musandam Oil and Gas Company, a subsidiary of OQ Exploration and Production – part of the OQ Group, I can say that offshore field management requires a unique blend of technical expertise and adaptability to thrive in its challenging and dynamic environment. Examples of this include handling offshore platforms and the sophisticated equipment and precise engineering designs they require, in addition to production and well inspection operations, and managing the weather's unpredictable patterns and their effects on routine maintenance visits and ongoing, nearly daily maintenance of offshore fields. Offshore field management presents a unique and professional experience, offering opportunities for learning and professional growth.



Zeyena Al Kindi

Rabab Harweel Production Coordinator
PDO

I am proud to be the first Omani woman to supervise production operations in the field as I was part of Rabab Harweel Integrated Project (RHIP), the largest PDO project ever. My exceptional journey began in 2012, when I joined PDO as part of the first batch of female operations graduates. Since then, I have amassed a wealth of expertise across the diverse range of roles I have played. My extraordinary career trajectory continues to soar as I embrace new challenges and takes on leadership roles within the company's operations. My unwavering commitment to excellence has led me to achieve "Six Sigma Black Belt" certification in the field of operations, fostering a culture of continuous improvement and innovation. My dedication to excellence has not gone unnoticed. My contributions to improving operational procedures and reducing greenhouse gas emissions have earned me well-deserved recognition and accolades from the Company's management. I am thrilled to be part of this esteemed company that helped me achieve a successful career and contributed to enabling me to be the first leader of the operations completion team, which constitutes a source of inspiration for all women working in the energy industry, demonstrating their distinctive competencies and skills.



Buthaina Almukhaini

Project Manager
Oman LNG L.L.C

Fresh out of Sultan Qaboos University, I embarked on my professional journey in the energy industry, joining a company where I was the sole Omani woman amidst a diverse team of nationalities. Undeterred by this initial challenge, I embraced the opportunity, and I was able to overcome these difficulties and challenges thanks to the support that women have received since the blessed Renaissance era. Omani women were vital in enhancing the sector's performance. My professional journey took an exciting turn when I decided to pursue greater challenges by joining Oman LNG. This pivotal step marked a significant leap in my career, allowing me to further enhance my expertise and capabilities within the energy industry. Oman LNG, recognizing women's enormous potential, has strongly promoted gender equality and empowerment initiatives, as the number of female cadres was much less than it is today when I joined the company.



Mohammed Al Abdulsalaam

Oil and gas well engineer
Daleel Petroleum Company

Staff and employees in the oil and gas engineering area get an abundance of social, scientific, and practical experiences. Working in the vital industry of oil and gas well engineering at Daleel Petroleum allowed me to refine my skills, expand my views, and enhance my performance on a constant basis. I also gained many professional and scientific advantages, incentives, and benefits. The oil and gas industry is a melting pot of cultures, bringing together individuals from diverse backgrounds. I have embraced this diversity, actively seeking opportunities to connect with colleagues from different nationalities and cultures. Beyond my technical responsibilities, I have actively participated in various initiatives aimed at creating local added value and empowering communities. Besides, I have actively participated in developing and delivering training programs for new hires and interns at Daleel Petroleum to prepare them for the future.

Empowering Communities through Local Content

Mohammed Al Amri
Director of Energy and Minerals Industries Localization



Local content receives great attention in the energy sector as it is an asset that contributes to strengthening the national economy and developing local technical capabilities. Accordingly, the Ministry of Energy and Minerals launched the local content strategy in 2013 for the oil and gas sector, which drew a road map for local content and its targets. Moreover, this strategy developed governance frameworks and a follow-up mechanism which allowed achieving many

important goals, the most prominent is that the percentage of local content or the financial value of total spending that remains within the Sultanate reached approximately 32% in 2023, the percentage of Omanization in companies operating the oil and gas sector exceeded 90% and the percentage of spending on small and medium companies reached more than 15%, and many supplier development programs have been implemented, in addition to more than fifty plants or workshops serving the sector.

As a continuation of efforts to promote the local value of the oil and gas sector, and in cooperation and joint coordination with oil and gas operators and local and international service and industrial companies, a number of projects were achieved during the last year 2023, which contributed positively to the development of the local market and national technical personnel, mainly:

- Ratification and approval of one factory to manufacture chemicals within the Sultanate of Oman in accordance with the required standards and specifications. This event is an important milestone as it will contribute directly to enhancing local value in addition to achieving a reduction in operational expenses and the evaluation of other chemical factories with the aim of expanding manufacturing opportunities in this vital field is in progress.
- The first well-drilling platform manufactured in the Sultanate with an electronic operation feature has been completed. It was manufactured using the latest technologies to ensure safe, efficient and sustainable drilling operations. The percentage of national technical personnel who contributed to the manufacture of the well-drilling platform reached 92%, and it is planned to manufacture 4 drilling rigs, which are expected to generate \$40 million in local value in the project.
- The development of local capacities in the field of additive manufacturing (3D printing) with the aim of manufacturing spare parts locally. The project includes evaluating about 150,000 unique spare parts to determine their feasibility and economic attractiveness. The project seeks to evaluate the possibility of reducing carbon emissions through the transition from the traditional manufacturing process to additive manufacturing process.

In terms of the deployed efforts to improve the local market and develop the capacities of the national companies through the local supplier development program, the following were implemented:

- » Manufacture of communications towers
- » Installation of solar photovoltaic energy
- » Manufacture and supply of hazardous waste barrels
- » Provision of gyroscopic services for the drilling operations
- » Provision of fabrication services
- » Diesel generators rental services

In line with the government's orientations to support and enhance the role of small and medium enterprises to contribute to achieving economic and social development, the total spending on small and medium enterprises in the oil and gas sector amounted to about 16% of the total value of procurements and tenders.

The Ministry is also currently working on a number of programs and projects in line with its new role, which has expanded to supervise the energy and minerals sector, to enhance local content, in line with the national policy for local content, which was approved by the Council of Ministers in March 2023. The most prominent initiatives and projects are reviewing and updating the current strategy, launching a new identity for the local content, the local content certification project, the initiative to enhance Omanization in the contracting and services sector for oil and gas companies, the Omanization strategy and mining local content.

Shaping Tomorrow: Oman's Social Responsibility Endeavors



Social responsibility is a fundamental focus in the oil and gas sector, because of the importance and role it represents towards society and stakeholders in accordance with the best practices that are consistent with the concepts of sustainable development.

Consequently, the Ministry of Energy and Minerals made considerable progress in the field of social responsibility, seeking to achieve the highest levels of success in serving society, providing the best projects and initiatives at a national level that includes all parts of the country, and efforts are still continuing by partners, in cooperation with the Ministry of Energy and Minerals, whereas agreements on projects in various sectors are concluded each year.

From this perspective, the Ministry worked to set a regulatory framework to enhance the role of companies in carrying out social responsibility programs by developing clauses obliging companies to allocate part of the annual budget to social responsibility. The Ministry does this with its partners to develop programs and prepare beneficiaries from among the community.

Many programs and projects have been implemented over the past years, jointly by oil and gas companies with the coordination of the Ministry. Among the most important of these projects for the year 2023, it is worth motioning that it was agreed to support three national projects with three different parties with an amount of two and a half million Omani riyals as a contribution from the companies together.

Support the development of Ibri Public Park:

Ibri Public Park is a recreational area with green spaces, marine areas and other areas for the citizens and visitors of the governorate. A plot of land with an area of five hundred thousand square meters has been allocated, and this project will be developed in three phases in line with the governorate's plan. Accordingly, the first phase of the project will be done on an area of 168,000 square meters, equivalent to 30% of the total land area. This phase includes the establishment of a public park including the activities. The design of the park took into

account the principles and requirements of sustainability in line with the governorate's vision for future development and the park's reliance on its financial inputs to cover the maintenance and operating costs.

Funding medical equipment for Khoula Hospital:

The project aims to fund the procurement of medical equipment for the Building No. 3 of Khoula Hospital, which was built in 2017. The procurement of all equipment will be funded to operate the orthopedic department and the ophthalmology clinic, so the center with all the specialized units in the two hospitals (Khoula and Al Nahda) will perform short-term operations and exit the hospital on the same day, to avoid exacerbation of patients' health problems, reduce waiting tables, and also reduce costs, where doctors in this building will be able to perform approximately 200 operations per week.

Sponsoring the Khuta platform for career guidance

The construction and development of the Khuta platform is a result of a comprehensive diagnostic process of the education system and the labor market. In fact, the Ministry of Energy and Minerals will be a main sponsor of the platform for the year 2024, because the electronic platform will play a crucial role in providing vocational guidance services in an advanced technical manner to a wide range of targeted school and higher education students and job seekers. It will also provide updated information and statistics for educational and training programs and Omani labor market data.

As per the mining sector, the Ministry of Energy and Minerals continues to play the role of providing the areas located near mining sites with social services, through providing the social responsibility amount from the mining sector, where 1% of the revenues shall be dedicated for social responsibility projects, and it will be implemented through the governors' offices under the supervision of the Ministry of Interior and the Ministry of Energy and Minerals.

The tremendous transformation that the oil and gas sector has brought at all levels of life since its discovery has made humanity's life system affecting and affected by this sector with all the fluctuations of global energy production, supply and demand. Indeed, the significant impact that the sector has on the development of countries on various direct and indirect economic and social levels requires following two main aspects. The first is the tangible and main areas of impact of the sector on producing countries, which can be summarized as follows:

- The significant revenues: Oil and gas are a main source of revenue for the producing countries, and these revenues can be used to finance infrastructure, improve public services such as education and health, and promote economic development.
- Impact on the national economy: The oil and gas industry can stimulate the economic growth through providing direct and indirect job opportunities, promoting economic diversification, as well as supporting or developing other sectors such as industry, transportation, services, agriculture, tourism and manufacturing industries. This impact contributes to the economy stability and the flexibility of its performance.
- Technology and innovation: The oil and gas sector encourages technological development and innovation in operations and mining. This development can result in new opportunities for innovation and technical development.
- Geopolitical impact: The oil and gas is an important factor in international relations, as possession of energy resources may lead to the increase of the producing countries political and economic influence.
- Social development: The oil and gas industry undoubtedly contributes to improving the standard of living of local residents by providing job opportunities and developing basic social and service infrastructure.

The second aspect, which is important to follow up its impact for this sector, concerns the behavioral or cultural aspect in communities and individuals, and the lifestyles that arose with the huge oil revolution, where the sector contributed to raising the individuals and societies standards of living, especially in producing countries, or countries depending on oil and gas in its industrial revolution.

There is also an impact on the level of career orientation and specialization in education. This aspect contributed also to improving the quality of educational, health, entertainment, and transportation services that countries provide their citizens with at an advanced level, all fall within the change in human lifestyle before the oil and gas revolution and after.

At the country level, the impact of the sector is not only an economic aspect, but also political. As a result, international organizations were established to support the stability of production and prices, and they also affected the international relations.

The great impact this sector has created globally must always be under control and measurement, as it can make countries vulnerable to the risks of fluctuations associated with it, such as declines in global oil prices or production decrease and the rising of hydrogen and renewable energy importance. Political tensions and economic instability can also affect the sector.

Fueling Change: The Revolution in Oil and Gas



Alhaitham Al Mushaifri
Director of Communication and Media

