

THE PIONEER



THE MAGAZINE OF QATARENERGY LNG

ISSUE 164, QUARTER 4, 2023

A HISTORIC LEAP FORWARD FOR THE NATION

Groundbreaking Ceremony of the North Field Expansion Project



Our Direction Statement is Our Compass

It should guide us in our day-to-day interactions, how we make decisions and our plans for the future.



Vision

THE WORLD'S PREMIER LNG COMPANY

Mission

QatarEnergy LNG provides quality LNG and other hydrocarbon products to the global market. We proudly and safely operate and maintain our facilities to Premier standard and we are actively developing new facilities on behalf of our shareholders to sustain and expand our capacity.

QatarEnergy LNG protects its people, assets and is committed to environmental sustainability. Our shareholders see consistently high value and return. We are proud to be known as a major contributor to the fulfillment of QatarEnergy's Vision, Qatar National Vision 2030, and the nation's future.

Pillars

- 1 Safety, Health and Environmental Sustainability
- 2 High Calibre Workforce
- 3 Efficient and Reliable Operations
- 4 Quality and Flawless Execution
- 5 Customer Satisfaction
- 6 Financial Performance

Values

We embrace Incident and Injury-Free

We care for and value people, process safety, the environment and sustainability above all else and demonstrate it in our commitments and actions.

We value our People

We value, recognize, and appreciate all our people and their families; we foster teamwork, collaboration and communication; we develop ourselves to be our best; we trust and empower one another.

We uphold Our Reputation

At QatarEnergy LNG we always do what we say; we promote honest and transparent communication and conduct our business ethically.

We strive for Premier Performance

We focus on quality in everything we do; we seek to innovate, optimize business and financial performance and ensure continuous improvement; we always put the greater interest of the Company first.

We focus on our Stakeholders

We place all stakeholders both internal and external at the heart of the business; we deliver on our promises.

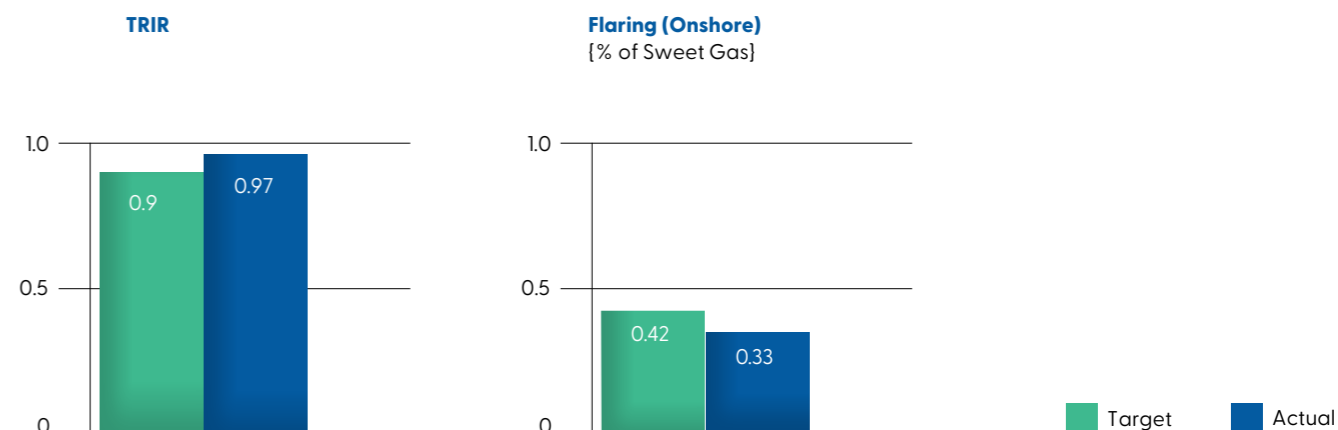


QatarEnergy LNG Corporate Scorecard

YEAR TO DATE 31st OCTOBER 2023



SAFETY, HEALTH AND ENVIRONMENTAL PERFORMANCE



EFFICIENT AND RELIABLE OPERATIONS

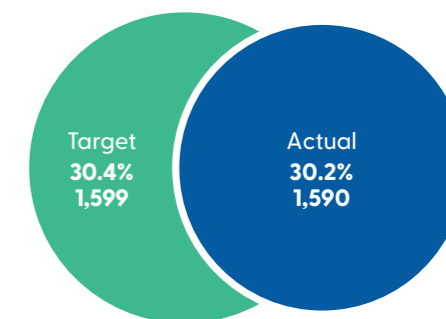
	Target	Actual
LNG Reliability	98.0%	97.8%
LR Reliability	98.4%	99.4%

CUSTOMER SATISFACTION

	Target	Actual
Late deliveries - LNG	0	1
Positive Responses to Customer Change Requests	100%	94%

GATARIZATION

A High Calibre and Diverse Workforce [Total Headcount]



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A NEW NAME WITH A STEADFAST MISSION



As pioneers in the LNG industry, we proudly unveiled our rebranded identity earlier this year. With a new name, logo, and brand identity, QatarEnergy LNG remains dedicated to its mission as

the world's premier LNG company. Our updated Direction Statement reflects a renewed commitment to safety, health, and environmental sustainability, while signaling our dedication to the future of LNG and its pivotal role in the global energy transition.

We recently marked a significant moment for our North Field Expansion Project. The groundbreaking ceremony was attended by His Highness Sheikh Tamim bin Hamad Al Thani, Amir of the State of Qatar, and His Excellency Mr. Saad Sherida Al-Kaabi, the Minister of State for Energy Affairs and

the President and CEO of QatarEnergy along with other dignitaries. This event showcased our commitment to global energy security. The project is progressing impressively and is set to increase Qatar's LNG production capacity from 77 to 126 million tonnes per annum.

I am also pleased to announce the successful integration of QatarEnergy LNG marketing and marketing-related activities into QatarEnergy. This milestone strengthens our focus on furthering our position as the industry leader for operational excellence and project delivery, especially as we near completion of the world's largest LNG production expansion.

Looking ahead, we are focused on the North Field Expansion and sustainability projects. We are partnering with our contractors to ensure the safe, successful, and timely completion of these major projects through quality and flawless execution in parallel with environmental stewardship.

As one of our company pillars, a high calibre workforce remains a priority for us. We are investing in our people by emphasising safety, employee engagement, and development. I'm proud that our efforts were recognized with the Annual Qatarization Crystal Award for Supporting Qatarization during the energy sector's Annual Qatarization Review Meeting.

Our name has changed, but our mission has not. We remain steadfast in our commitments as the world's premier LNG company.

Khalid bin Khalifa Al Thani
Chief Executive Officer
QatarEnergy LNG

His Highness the Amir Places Foundation Stone at NFXP

North Field Expansion Project will raise the State of Qatar's LNG production capacity from the current 77 million tonnes per annum (MTPA) to 126 MTPA by 2027.



His Highness Sheikh Tamim bin Hamad Al Thani, Amir of the State of Qatar, led the delegation to officially break ground on the North Field Expansion Project by laying a foundation stone at Ras Laffan Industrial City in early October.

His Highness Sheikh Tamim bin Hamad Al Thani, Amir of the State of Qatar, formally launched the prestigious North Field Expansion Project by placing the foundation stone at a special groundbreaking ceremony at Ras Laffan Industrial City in early October 2023.

The North Field Expansion Project (NFXP) will raise the State of Qatar's liquefied natural gas (LNG) production capacity from the current 77 million tonnes per annum (MTPA) to 126 MTPA by 2027, an increase of 63%.

The project's groundbreaking was attended by His Excellency Mr. Saad Sherida Al-Kaabi, the Minister of State for Energy Affairs, the President and Chief Executive Officer (CEO) of QatarEnergy, Khalid bin Khalifa Al Thani, the CEO of QatarEnergy LNG, members of the QatarEnergy LNG management leadership team, and the Chief

Executive Officers and senior executives of the Joint Venture partners in the expansion projects.

A quantum leap for Qatar

NFXP includes six LNG mega-trains with a production capacity of eight MTPA of LNG each, four of the LNG mega-trains are part of the North Field East (NFE) expansion project and two of the LNG mega-trains are part of the North Field South (NFS) expansion project which will contribute a combined total of 48 MTPA to global LNG supplies.

In addition to LNG, the NFE and NFS projects will produce 6,000 tonnes per day of ethane which will be used as a feedstock in the local petrochemical industries. NFXP will also produce about 200,000 barrels per day (bpd) of liquefied petroleum gas (propane

and butane) and about 370,000 bpd of condensates in addition to large quantities of pure sulfur and helium.

NFXP includes the largest helium plants in the world which will enable Qatar to become the world's largest producer and exporter of valuable helium gas. The project also includes the largest carbon capture storage facility in the Middle East, to mitigate greenhouse gas emissions.

Speaking at the groundbreaking ceremony, His Excellency Mr. Saad Sherida Al-Kaabi stressed that this pioneering expansion project is a quantum leap in Qatar's leadership in the field of energy, and an embodiment of its goals towards optimal investment in the country's natural resources and commitment to providing the world with a cleaner source of energy over many future decades.

His Excellency Minister Al-Kaabi said, "On the local level, this project will have short-term and long-term impacts that will be reflected across all sectors of the Qatari economy and will significantly enhance the State's revenues. This major expansion comes at a crucial time as natural gas occupies a pivotal position in the energy mix in a world facing geopolitical turbulence and is in dire need of clean energy sources that are in line with the global environmental goals."

His Excellency Minister Al-Kaabi added, "There is no doubt that these additional quantities of liquefied natural gas are of great importance as they will play a prominent role in enhancing energy security, supporting a practical and realistic energy transition, and ensuring fair and equitable access to cleaner energy for a sustainable growth and a better future for all."

His Excellency Minister Al-Kaabi concluded his remarks by thanking QatarEnergy's partners, and the working teams of QatarEnergy and QatarEnergy LNG, and the EPC contractors working to implement this project to the highest quality and safety standards.

"I am honoured to extend ample thanks and gratitude to His Highness the Amir, Sheikh Tamim bin Hamad Al Thani, for

honouring us with his presence and patronage of this celebration, and for his unlimited support and guidance to us in the energy sector."

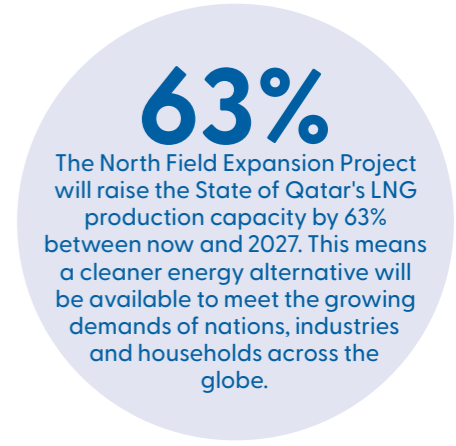
Safety and operational integrity a top priority

Sheikh Khalid bin Khalifa Al Thani, the Chief Executive Officer of QatarEnergy LNG said, "This project embodies our commitment to advancing sustainable energy solutions through a design that utilises advanced technologies to mitigate our emissions and environmental impact.

"Our commitment to innovation, technology and strategic partnerships advances QatarEnergy's goal of becoming a prominent player in the LNG market and contributing significantly to Qatar's economic growth. Safety and operational integrity remain our top priority as we continue to shape a sustainable and energy-secure future through LNG."

Nafez Bseiso, QatarEnergy LNG's Chief Major Projects Officer explained that the NFXP is a fully integrated chain – from reservoir and offshore to onshore facilities to product loading berths and product shipping.

He said, "the scale and design that make this challenging project so unique. We



are also very proud of the environmental protection initiatives we are building into this project. These include emissions reductions, coral protection measures and other biodiversity protection measures and wastewater treatment. To make all of this happen, we are relying on the contractors expertise of our shareholders, EPC contractors, skilled professionals, and a workforce from 61 different countries."

NFXP is partnering with CNPC, ConocoPhillips, ExxonMobil, Eni, Shell, Sinopec and TotalEnergies whose contributions will play a pivotal role in ensuring the project's success and achieving its goals by producing LNG that is the best in the world in terms of safety, reliability, and carbon footprint.





NFXP LNG Process



Offshore Platforms

Gas and other liquids are extracted from Qatar's vast North Field. Thirteen offshore platforms are being built and 130 development wells are being drilled, including the longest horizontal drilling well in Qatar.

Pipelines and Beach Valves

The feedstock is transported through pipelines to shore. Offshore pipelines continue underground onshore up to the inlet receiving facilities at the LNG facilities. Beach valves are installed to isolate sections of the multiphase (mixture of gas and liquids) in these pipelines if necessary for emergency response.

Slug Catcher and Inlet Area

The multiphase flow from offshore platforms arrives here and the first step of separation is carried out. Slug catchers provide for the separation of gas and liquids (condensates and produced water) and protect downstream processing equipment from large volumes of liquid (slugs) before the gas enters the LNG trains. The field condensate is stabilised to remove light end hydrocarbons which are re-compressed and fed into the inlet gas stream. One-half of the field condensate will be deodorised for export to international markets. The other half will be utilised in the Laffan Refinery for the generation of fuel products. The inlet area will also treat process water to allow for the reuse of this water in the cooling water system. Produced water from the slug catcher will be treated prior to injection into approved reservoirs for permanent storage.

LNG Trains

The gas from the slug catcher undergoes sour gas processing to remove hydrogen sulfide (H₂S) and Carbon Dioxide (CO₂). The H₂S is converted into molten sulfur where it is stored in offsites tanks prior to shipment to the Sulfur Storage and Loading Facility. The CO₂ is compressed and sent to injection wells for carbon capture. The rich sweet gas is dehydrated, has minuscule amounts of mercury removed and enters the NGL recovery unit to extract natural gas liquids (ethane, propane, butane and light naphtha) from the gas. This natural gas liquid stream undergoes fractionation to separate these products into separate product streams. The dry lean natural gas consisting of methane and ethane is super cooled to -160 °C to produce Liquefied Natural Gas (LNG).

The LNG trains also require utilities including: steam generation, power generation from gas turbine generators and steam turbine generators, imported power, desalinated water that is re-mineralised for use in a fresh cooling water system for heat removal in various process unit, instrument air, air separation unit to produce liquid and gaseous nitrogen and chemical storage for various solvents used to treat the sour gas.

LNG Tanks

The processed LNG is stored in five full containment LNG tanks (with a combined capacity of 935,000 cubic metres) before export. This storage tank area also includes compressors to capture boil-off gas from the tanks which is sent to the LNG plants for use as fuel. In addition, boil-off gas during ship loading is captured through the expansion of the Common Compression Area to recompress this boil-off gas for use in the LNG plants as fuel. The capture and re-use of these boil-off gas streams reduces flaring and provides a clean source of fuel gas which allows for more offshore gas to be processed as LNG.

Storage and Loading

A Sulfur Storage and Loading Facility will be added to process molten sulfur produced from sour gas processing for the six LNG mega-trains. The Sulfur Storage and Loading facilities will include molten sulfur storage, utility systems, granulators to convert molten sulfur into solid sulfur pellets, sulfur storage building with equipment to stack the solid sulfur and then reclaim the solid sulfur for loading onto vessels through a dedicated ship loader. The NFE and NFS projects will utilise the existing Common Sulfur Project pipeline network for molten sulfur delivery to the NFXP Sulfur Facility that can process up to 5,000 metric tonnes per day.

CLPG / CCSL / MEG

Liquefied Petroleum Gas (LPG), Deodorised Field Condensate and Untreated Field Condensate and naphthenic caustic is transported through pipelines to a dedicated storage area in the Ras Laffan Terminal Operations. Refrigerated Liquid product tanks for propane and butane which include vapor recovery units to provide refrigeration to minimise product losses are being installed along with field condensate and light naphtha tanks as additional storage capacity is required for these liquid products. Liquid product loading berths are being expanded to enable loading of these additional liquid product streams.

Mono-ethylene Glycol (MEG) storage tank and distribution pumps are being installed to provide MEG to Offshore and Onshore facilities for hydrate inhibition during the winter months.

Loading Berths (Terminals)

The LNG and Liquid Products Berths are the terminal facilities that provide for the loading and export of LNG and associated liquid products and solid sulfur. From here, vessels will transport Qatar's LNG and associated products to customers around the world.

NFXP Groundbreaking in Numbers

The expansion of LNG production represents a clear demonstration of the State of Qatar's steadfast commitment to add to the world's supply of cleaner energy and maintain the country's pre-eminence as the world's leading liquid natural gas (LNG) supplier.

The North Field Expansion Project (NFXP) will enhance Qatar's production capacity and delivery flexibility, enabling it to meet additional global demand for natural gas while supporting the transition to less carbon-intensive energy in many parts of the world.

NFXP will generate substantial revenues for the State of Qatar and will have significant benefits to all sectors of the Qatari economy during the construction phase and beyond. QatarEnergy LNG continues to strive to develop its natural gas resources and lead the way in the world's LNG value chain.

NFXP Project

63% Increase

The percentage increase in Qatar Energy LNG's production of LNG by 2027 thanks to the NFXP, from the current 77 million tonnes per annum (MTPA) to 126 MTPA, adding more than 48 MTPA to the world's LNG supplies.

110 MTPA

North Field East (NFE) represents the first phase, where LNG production capacity will be increased from the current production capacity of 77 MTPA to 110 MTPA.

126 MTPA

The second phase, North Field South (NFS), will further increase Qatar's LNG production capacity from 110 MTPA to 126 MTPA.

6 Mega Trains

Six new LNG mega-trains are being built, along with associated utilities and offsite facilities. Four LNG mega-trains are part of the North Field East expansion project, and two LNG mega-trains are part of the North Field South expansion project.

8 MTPA

Each new LNG train will have a capacity of 8 MTPA.

48 MTPA

The six trains will contribute a total of 48 MTPA to global LNG supplies.

13 New Platforms

Thirteen new offshore platforms are being built for the project.

130 Drilling Wells

130 development wells are being built, including the longest horizontal drilling well in Qatar.

1,200km of Pipeline

More than 1,200 kilometres of pipeline and cables are being laid to bring the gas onshore.

5 LNG Storage Tanks (935,000 m³)

Five new LNG storage tanks are being built to store the processed LNG – three x 187,000 cubic metre tanks for NFE and two x 187,000 cubic metre tanks for NFS. Total new LNG storage capacity for the 5 tanks is 935,000 cubic metres.

5,000 TPD of Sulfur

Sulfur Storage and Loading Facilities that include molten sulfur granulators, sulfur storage and loading building and ship loader will handle up to 5,000 metric tonnes per day (TPD) of molten sulfur production and utilise tie-ins to the existing Common Sulfur Project pipeline network to deliver molten sulfur to the new facilities.

6,000 TPD of Ethane

The NFE and NFS projects will produce 6,000 metric tonnes per day of ethane which will be used as a feedstock in the local petrochemical industries.

200,000 BPD of LPG

The NFE and NFS projects will produce about 200,000 barrels per day (BPD) of liquefied petroleum gas (propane and butane).

370,000 BPD of condensates

The NFE and NFS projects will produce about 370,000 BPD of condensates.

4 LNG Berths (70 MTPA)

Four new LNG berths will be built to export the LNG product, the combined capacity of the 4 berths is 70 MTPA.

100 Ships

The four LNG berths will support 100 new ships, the largest LNG fleet in the world.

Workforce

100,000 People

At peak capacity it is expected that there will be more than 100,000 people working on this project.

61 Countries

This will include a workforce from more than 61 different countries.

60,000 Workers

NFE will require 60,000 workers (there are currently 40,000 working on the project)

120 Million Manhours

One hundred and twenty million manhours have already been worked on the project (as of 4Q 2023)

400 Million

Four hundred million + manhours are expected to be worked by project completion for NFE alone.

NFE Project Numbers

8 Wellhead Platforms

NFE offshore facilities consist of eight Wellhead Platforms (WHP) for the 15 wells per platform that are currently being drilled.

16,500 tonnes

The combined total weight of the wellhead platforms is more than 16,500 tonnes of steel and when completed will be placed on top of eight steel pile jackets that are already fabricated and installed.

320km

Three hundred and twenty kilometres of pipelines, which vary in size from 28 and 38 inches in diameter, will be installed.

226km

Two hundred and twenty-six kilometres of six-inch mono-ethylene glycol (MEG) pipeline will be installed that will distribute MEG for wintertime hydrate inhibition at the WHP and in the pipeline network.

232km

Two hundred and thirty-two kilometres of power and fibre optic cable will be installed to provide power from the NFE onshore facility and to provide control links from the Offshore WHP back to the onshore facilities.

4 Mega Trains

The NFE onshore facilities include four LNG mega-trains (T8, T9, T10 and T11) with a capacity of 8 MTPA, associated facilities including a helium refining unit, and associated utilities (e.g., steam generation, power import, power generation, fresh cooling water system, desalination water plant, fire water, Nitrogen Generation and Instrument Air). The process trains include the following units: Acid Gas Removal Unit, Sulfur Recovery Unit, Tail Gas Treating Unit (to achieve emissions requirements) Dehydration Unit, NGL Extraction, NGL Fractionation Unit, Mixed Refrigerant Units, LNG Liquefaction, Helium Extraction and Nitrogen Rejection. Additionally common units include Condensate Stabilisation Unit, Condensate Deodorizing Unit and CO₂ Compression.

NFE End Products

NFE will produce:

- 4,000 tonnes per hour of LNG
- 4,000 tonnes per day of ethane for local industries feedstock
- LPG - Liquid Petroleum Gas (propane and butane) for international export:
 - 89,000 barrels per day of propane
 - 49,500 barrels per day of butane
- 26,000 barrels per day of plant condensate for international export
- 221,200 barrels per day of untreated field condensate for delivery to Laffan Refinery
- Up to 1 billion standard cubic feet per day of back-up sales gas
- 2,800 tonnes per day of molten sulfur
- 14.4 tonnes per day of helium

Ownership

NFE Ownership Capacity

Four trains to reach 110 MTPA:

Capacity	Ownership
25%	QatarEnergy 75% TotalEnergies 25%
25%	QatarEnergy 75% ExxonMobil 25%
25%	QatarEnergy 75% Shell 25%
12.5%	QatarEnergy 75% ENI 25%
12.5%	QatarEnergy 75% ConocoPhillips 25%

NFS Ownership Capacity

Two trains to reach 126 MTPA:

Capacity	Ownership
9.375%	QatarEnergy 75% TotalEnergies 25%
9.375%	QatarEnergy 75% Shell 25%
6.25%	QatarEnergy 75% ConocoPhillips 25%
75%	QatarEnergy

NFE - Environmental Dimension

NFE is a key vector for QatarEnergy's GHG emissions intensity reduction targets for 2030 and 2035.

- The NFE project has world-class CO₂ reduction initiatives supported by:
 - One of the largest CO₂ capture and sequestration system in the LNG industry in terms of its capacity to inject 2.2 MTPA
 - Enhanced energy efficiency due to waste heat recovery facilities; improved fuel gas recycle and enrichment, thus also minimising methane emissions

Significant portion of the project's electrical power import from Qatar's solar projects.

- Energy efficiency will improve due to the use of waste heat recovery facilities installed on gas turbines that drive refrigeration compression units and generators.
- Reduced water consumption through our Wastewater Recovery Unit which recovers 75% of the process water generated in the plant.

- Significantly reduce NO_x (Nitrous Oxides) and SO₂ (Sulfur Dioxides) footprint by using Ultra-Low NO_x technology on gas turbine drivers for refrigeration and power generation and having 99.9% sulfur recovery from the Sulfur Recovery Unit and Tail Gas Treating Unit.

QatarEnergy LNG showcases industry expertise at global LNG conference

His Excellency (HE) Mr. Saad Sherida Al-Kaabi, the Minister of State for Energy Affairs, the President and CEO of QatarEnergy, spoke at the LNG2023's Leadership Dialogue, while QatarEnergy LNG presented technical papers at Discussion Panels and technical posters on the Discovery Hub.

QatarEnergy LNG joined QatarEnergy as part of a Qatar delegation attending the 20th International Conference & Exhibition on Liquefied Natural Gas (LNG2023) held in July in Vancouver, Canada. One of the largest global LNG industry conferences and exhibitions, the LNG Conference Series has been the leading meeting place for the international LNG industry for more than 54 years.

QatarEnergy LNG Chief Executive Officer (CEO), Khalid bin Khalifa Al Thani, led a large delegation which included Management Leadership Team members from the Company, Ahmad Helal Al-Mohannadi Chief Onshore & Operations Support Officer; Fahad Mohd Al Khater, Chief Offshore/ Terminals & Refineries Officer; Alaa Abu Jbara, Chief Commercial & Shipping Officer; as well as delegates from different disciplines across the Company.

In addition, several subject matter

experts from QatarEnergy LNG participated in the conference as speakers and presenters, covering a wide range of technical subjects. The delegation also attended numerous sessions and met with colleagues and peers from across the industry to share knowledge and network.

HE Mr. Saad Sherida Al-Kaabi, the Minister of State for Energy Affairs, the President and CEO of QatarEnergy, spoke at the event's Leadership Dialogue. During the session HE Mr. Al-Kaabi announced that when all of the Company's projects are online, 40% of all the new LNG on the market will come from QatarEnergy alone.

HE Mr. Al-Kaabi also gave an overview of QatarEnergy's efforts to deal with the energy trilemma – of security in supply, affordability, and sustainability – by providing the world with the cleaner energy it needs for a responsible energy transition. "We have to have a balance

between what we need for humanity and how we can manage it properly. In Qatar, we are increasing production to 126 million tonnes per annum (MTPA) and we have another 16 to 18 MTPA out of the United States (US) coming online next year. We are doing it in the most responsible way as far as emissions are concerned with CO₂ sequestration."



QatarEnergy LNG representatives joined QatarEnergy as part of the country's delegation attending LNG2023, one of the largest global LNG industry conferences and exhibitions.

QatarEnergy LNG's Technical Display

QatarEnergy LNG presented four technical papers in the LNG2023 Discussion Panels and eight technical posters which were shared on the LNG2023 Discovery Hub:

Technical papers (LNG2023 Discussion Panels):

- Maintenance Model on World Class Largest LNG Company Merger – Mohammed Al-Khaldi, Planning & System Division Manager, Planning & System Division
- Using of Drone Inspection in Ensuring Fixed Equipment Mechanical Integrity – Abdulla Al-Hammadi, Inspection Engineer, Integrity & Reliability Engineering
- An Integrated Approach in Prevention of Major Accident Events – Step Change in Process Safety – Sadiq Azeez, Head-Loss Prevention & Risk Engineer, LPE Site II
- World Class Environmental Standards: Greenhouse Gas (GHG) Emissions Reduction Experience in Gas & LNG

Industries – Salman Ashkanani, Execution Planning & Services Manager, Execution Planning & Services

Technical posters (LNG2023 Discovery Hub):

- Off-Gas Compressors Operation & Design Consideration, Rotor Impeller Failure Case Study – Mohamed Abdel Khalek, Rotating Equipment Specialist, Rotating Equipment South Area
- Environmental Regulatory and Permitting Challenges of LNG Project Development – Ahmed Al-Mohamedi, Environmental Ops Lead, Environmental Affairs & Regulatory
- Repetitive Foaming Events in AGR Units – Abdulla Mohammed Al-Emadi, Senior Process Engineer, Asset & Surveillance Engineering

- Managing Chloride Induced Stress Corrosion Cracking (CISCC) in Operating LNG Facilities – Mansoor Al-Nuaimi, Lead of corrosion North Area

- Innovations in Startup and De-Pressuring Procedures Enabling Significant Reductions in Flaring – Fahad Al Shamri, Head of Train 1, Onshore Operations - South

- Asset Risk Reduction Through Comprehensive Approach for Braze Aluminum Heat Exchanger (BAHXS) Covering Core and Transition-Joints Integrity Concerns – Ahmad Al-Sulaiti, QG3&4 Asset Manager, QG3&4 Asset

- Hydrate Formation Cause and Learning for Liquefaction Unit – Sunil Solanki, Senior Process Engineer, Asset & Surveillance Engineering.

Focusing on Qatar's role in this effort, HE Mr. Al-Kaabi said: "Qatar has the largest sequestration site in the MENA region today. We are injecting more than 2 MTPA of sequestered CO₂ today and we are going to reach 11 MTPA in a few years. We are using solar power to power some of our new LNG production. Qatar's LNG carbon intensity is probably the lowest in the world. So we are doing it in a very responsible fashion and we are reducing emissions."

The LNG Conference Series is held every three years alternating between

exporting and importing countries. The State of Qatar will proudly host the next event in 2026, coinciding with the historic start-up of the North Field LNG expansion project and the commissioning of one of the largest Carbon Capture and Storage schemes in the world.

QatarEnergy also hosted a networking function to welcome participants to the event in 2026 and preview Qatari culture with a showcase of traditional food and music.

The QatarEnergy exhibition stand which was shared with QatarEnergy LNG and Nakilat showcased the LNG vessels in a state-of-the-art virtual reality showcase and featured a prominent Qatari artist Mubarak Al Malik, who created a painting of QatarEnergy's new LNG vessels, completing the artwork on the final day in a wonderful piece illustrating the new LNG carriers.

"We are using solar power to power some of our new LNG production. Qatar's LNG carbon intensity is probably the lowest in the world. So we are doing it in a very responsible fashion and we are reducing emissions."

– His Excellency Mr. Saad Sherida Al-Kaabi, the Minister of State for Energy Affairs, the President and CEO of QatarEnergy, speaking at the event's Leadership Dialogue.

Celebrating new-gen LNG vessels in Korea

QatarEnergy, Samsung Heavy Industries and JP Morgan Asset Management celebrate steel cutting milestone on Geoje Island.

QatarEnergy celebrated the steel cutting of the first of its new generation of chartered Liquefied Natural Gas (LNG) vessels earlier this year on Geoje Island in the Republic of Korea.

Building on an already successful global maritime initiative, QatarEnergy joined Samsung Heavy Industries and JP Morgan Asset Management in a special ceremony to celebrate this milestone, which is part of QatarEnergy's historic LNG Fleet Expansion Project.

QatarEnergy LNG Chief Executive Officer (CEO), Khalid bin Khalifa Al Thani, attended the Geoje Island ceremony on behalf of His Excellency Saad Sherida Al-Kaabi, the Minister of State for Energy Affairs, the President and CEO of QatarEnergy, along with Mr. Jin-Taek Jung, the CEO of Samsung Heavy Industries, and Andy Dacy, the CEO of JP Morgan's Global Transport Group. Also

in attendance were senior executives from QatarEnergy and QatarEnergy LNG.

The event signified an extension of QatarEnergy's international collaborations and commitment to global partnerships and follows the October 2022 successful initiation of steel cutting at Hudong-Zhonghua, a Chinese shipyard renowned for its excellence in LNG shipbuilding, as well as QatarEnergy's 2020 decision to enter into Ship Slot Reservation Agreements

with Hudong-Zhonghua along with the three Korean shipyards: Samsung Heavy Industries, Hyundai Heavy Industries and Hanwha Ocean (previously known as Daewoo Shipbuilding and Marine Engineering).

Subsequently, in 2022, QatarEnergy signed multiple Time Charter Parties with various shipowners, including affiliates of JP Morgan Asset Management, a fund investing in a wide array of transportation assets worldwide.

The steel cutting follows QatarEnergy's 2020 decision to enter into Ship Slot Reservation Agreements with multiple shipyards, Samsung Heavy Industries, Hyundai Heavy Industries, Hanwha Ocean (previously known as Daewoo Shipbuilding and Marine Engineering) and Hudong-Zhonghua.



The ceremony was attended by QatarEnergy LNG Chief Executive Officer (CEO), Khalid bin Khalifa Al Thani, Jin-Taek Jung, the CEO of Samsung Heavy Industries, and Andy Dacy, the CEO of JP Morgan's Global Transport Group. Also in attendance were senior executives from QatarEnergy LNG.

Looking ahead at the 13th QPSS

QatarEnergy LNG, Texas A&M University at Qatar (a Qatar Foundation partner university), and ConocoPhillips Qatar Ltd (ConocoPhillips), recently hosted the 13th edition of the Qatar Process Safety Symposium (QPSS) in Doha.

The event's theme, 'Looking Ahead', emphasised the vital importance of continuously anticipating and assessing new issues and challenges in process safety.

Over 700 attendees from more than 80 companies gathered at this annual event for premier process safety leaders from across the global energy sector, with more than 40 expert speakers from industry and academia presenting the latest advancements and challenges in process safety.

In his opening address, QatarEnergy LNG Chief Executive Officer (CEO), Khalid bin Khalifa Al Thani, said, "Process safety remains an unwavering priority for QatarEnergy LNG. This year's symposium aligns seamlessly with our dedication to upholding the highest standards of safety, operational excellence, and sustainability as we expand our LNG operations in Qatar.

"Our commitment to process safety reflects our dedication to the well-being of our people, and to safeguarding our environment and communities."

The keynote address, 'Process Safety – Key to QatarEnergy LNG Developments', was delivered by Steinar Vaage, President, Europe, Middle East, and North Africa at ConocoPhillips. Vaage spoke on the importance of maintaining best industry practices in process safety and risk management, which is critical in light of the second phase of the LNG expansion projects currently taking place in Qatar.

Confirming this view in his welcome speech, Khalifa Ahmed Al-Sulaiti, Chief Health Safety, Environment and Quality Officer of QatarEnergy LNG, stressed the significance of cultivating a resilient process safety culture and the vital role of maintaining barrier integrity.



Industry-wide collaboration is key to achieving process safety excellence, illustrated by the participation of representatives from regional and international companies within the energy sector.

Collaboration among industry and academia

Industry-wide collaboration is also key to achieving excellence in process safety, a point underscored with the participation of representatives from various regional and international companies within the energy sector, including QatarEnergy, ExxonMobil, QAPCO, Qatar Shell, Arabian Petrochemical Company, and Kuwait National Petroleum Company, among others.

Commenting on the importance of industry-academia partnerships in forging excellence in process safety, Dr. César Malavé, Dean of Texas A&M at Qatar, said, "I believe the connection between industry and academia is central when it comes to process safety, as we also create the energy leaders of tomorrow. The natural ability of academia to tie in both technical and

non-technical knowledge is crucial in forging a secure and resilient energy landscape."

Nafez Bseiso, Chief Major Projects Officer of QatarEnergy LNG, delivered an overview of the ongoing major LNG expansion projects in Qatar. He highlighted the key factors influencing process safety within these expansion projects, including safety engineering, quality assurance and people, all of which are integral to the projects' design and implementation phases and guarantee the safe and reliable operations of upcoming facilities.

The annual QPSS Process Safety Excellence Award was also presented at the event, recognising the achievements of Umair Shahab Shahid from QAPCO and Ahmad Abdulla Rashid Al-Khalifa from QatarEnergy.

"This [event] aligns seamlessly with our dedication to upholding the highest standards of safety, operational excellence, and sustainability as we expand our LNG operations in Qatar."

— QatarEnergy LNG CEO, Khalid bin Khalifa Al Thani.

QatarEnergy LNG's pivotal first delivery to India's Dhamra Terminal

Company executed the sale on a Delivered Ex-Ship (DES) basis to the renowned French multi-energy company, TotalEnergies.



Milaha Ras Laffan at Dhamra Terminal.

QatarEnergy LNG successfully supplied a commissioning liquefied natural gas (LNG) cargo to India's newest LNG receiving terminal, Dhamra, aboard the vessel Milaha Ras Laffan in April 2023.

The Company executed the sale of LNG on a Delivered Ex-Ship (DES) basis to the renowned French multi-energy company, TotalEnergies, which transported it on to Dhamra, their 50-50 joint venture with the Adani Group (known as Adani Total Private Limited).

QatarEnergy LNG Chief Executive Officer (CEO), Khalid bin Khalifa Al Thani, said, "We are resolutely committed to meeting the surging demand for cleaner energy in India and across the globe. Our consistent and secure supply of LNG will aid India in fulfilling its energy requirements while contributing to its economic growth.

India's Dhamra Terminal

Dhamra features two tanks, each with a capacity of 170,000 cubic metres (CBM). Its jetty is equipped to handle LNG carriers with capacities from 70,000 to 265,000 CBM. The terminal also offers breakbulk services, facilitating the reloading of LNG to smaller vessels for further distribution, along with a LNG truck loading facility.

5 million

Dhamra Terminal boasts a capacity of five million tonnes of LNG per annum.

"QatarEnergy LNG remains steadfast in its dedication to sustainable operations and the delivery of value to our customers, partners, and stakeholders. I extend my gratitude to our esteemed partner, TotalEnergies, for their invaluable contribution to the success of this delivery."

Thomas Maurisse, Senior Vice President LNG, TotalEnergies, said, "We are delighted to have successfully completed the first LNG delivery to the newly-inaugurated Dhamra LNG terminal by QatarEnergy LNG, our long-standing strategic partner.

"This state-of-the-art LNG terminal will significantly bolster India's energy security and aligns perfectly with TotalEnergies' commitment to support India's energy transition and its goal of

"We are resolutely committed to meeting the surging demand for cleaner energy in India and across the globe."

– QatarEnergy LNG CEO, Khalid bin Khalifa Al Thani.

increasing the share of natural gas to 15% of its energy mix by 2030."

Dhamra houses India's seventh operational LNG terminal, making it the second facility of its kind on the country's east coast. It is the inaugural LNG import terminal for Adani Total Private Limited, boasting a capacity of five million tonnes per annum (MTPA).

Upon full commissioning, Adani and TotalEnergies will provide regasification services to their downstream Indian customers.

QatarEnergy LNG in Canada for 24th WPC



QatarEnergy LNG joined more than 5,000 delegates and 10,000 visitors at the 24th World Petroleum Congress (WPC) from September 17 to 21, 2023 in Calgary, Canada.

The triennial event, widely known as the 'Olympics' of the petroleum industry, covers aspects of the sector such as

technological advances in upstream and downstream operations and the role of natural gas and renewables.

This year, QatarEnergy LNG's delegation was led by Haytham Abdulaziz Al Meer, Chief Subsurface Officer, who was joined by Company subject matter experts to highlight the Company's

commitment to sustainability, technological advancements and responsible energy production under the theme of 'Energy Transition: The Path to Net Zero'.

Technical Forum Presentations were given by Maryam Al-Kaabi, Lab Quality Specialist, who hosted 'Liquid Hydrogen Production Associated with Qatar Natural Gas Production,' and Nasser Al-Saei, Operations Coordinator, who hosted 'A Success Story: Intelligence in Molecular Sieve Beds Desiccant Online Change Out'.

Meshaal Al-Rashid, Production Engineer, gave a poster presentation titled 'QatarEnergy LNG Leading Initiative in Wastewater Treatment and Injection Management'.

The next iteration of the event will be held in Riyadh in 2026.

Insight and innovation at Engineering Forum 2023

QatarEnergy LNG hosted the 18th annual Engineering Forum in on 27 September 2023, attracting approximately 1,200 participants from oil and gas companies and academic institutions at the Qatar National Convention Center (QNCC).

Sheikh Khalid bin Abdulla Al-Thani, Chief Engineering & Projects Officer, QatarEnergy LNG, delivered the event's opening remarks on behalf of QatarEnergy LNG CEO, saying, "This gathering of highly skilled professionals provides an exceptional platform for sharing knowledge, best practices, and lessons learned among industry peers."

Sessions were indeed dedicated to topics that advance engineering excellence, including Optimisation and Best Practices, Integrity, Reliability and Process Safety, and Innovation, Technology and Sustainability. A total of 194 abstracts were submitted for consideration, resulting in 21 selected presentations and 19 technical posters.

This year, the forum featured additional initiatives, including a

Panel Discussion and Booths. The panel discussion, featuring Nafez Bseiso Chief Major Projects Officer, Shaikh Khalid bin Abdulla Al-Thani Chief Engineering & Projects Officer and Haytham Abdulaziz Al Meer Chief Subsurface Officer as panelists, focused on "QatarEnergy LNG's Strategy for major projects and production sustainability." The panelists shared insights into the company's future plans and strategies in this field. It was moderated by Mehsein Al-Qadi, Engineering & Projects Business Manager.

QatarEnergy LNG's strategic vendors and Qatar University actively

participated in the Booths, where they demonstrated cutting-edge technologies and research related to the oil and gas industry, highlighting innovations intended to enhance operational efficiency.

The event concluded with a speech by Haytham Abdulaziz Al Meer, Chief Subsurface Officer, QatarEnergy LNG, who emphasised the importance of knowledge transfer at such an event and encouraged all participants to apply their newfound knowledge to enhance their business operations.



Laffan Refinery excelled in business performance utilising Reliability study approach

Laffan Refinery (LR) successfully eliminated five planned pigging shutdowns across 2022 and 2023, resulting in an additional 90 days of production against the approved budget and subsequently exceeding asset reliability, availability, and financial targets. Moreover LR1 & LR2 achieved longest 'pigging'-free uptime since 2016 with 22 months and 24 months respectively, historical average uptime was around 5-8 months.

The transformative impact of reliability analysis, also known as Root Cause Failure Analysis (RCFA), was realised through the diligence and collaboration of multidisciplinary teams, including the refinery asset, condensate producing assets, engineering technical teams, maintenance, operations support team (LAB), and Others.

Thanks to the transformative impact of reliability analysis, the Company has ensured uninterrupted operations and driven substantial cost savings at its LR asset.

What is 'Pigging'?

'Pigging' is a process used to clean, inspect and maintain pipelines. A 'pig', which is a device inserted into the pipeline, travels through the pipe to establish pipeline integrity, propelled by the flow of the product, ensuring smooth and efficient operations.

Around 90 of the recommendations were implemented for the following four main causes

- Feed contaminant carryover
- Insufficient water drainage prior to feeding the refinery,
- High fouling tendency of recycled Heavy Gas Oil (HGO) to the condensate heater
- Lack of condensate diversion procedure during upstream pigging operations

This incredible result speaks to the combined interest, single team spirit, quality, commitment, tenacity and proactive planning that is part of QatarEnergy LNG's culture.

Congratulations to the LR team and to everyone else involved in this great achievement.

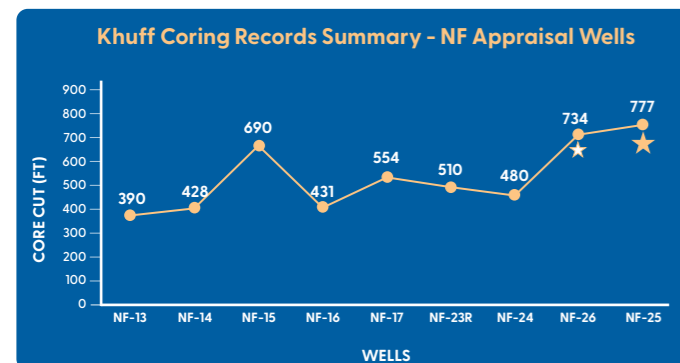
New coring world record set on NF-25A

QatarEnergy LNG Drilling and Completions Department recently set a new world record for single-run core recovery, achieving 777.58 feet of core recovered in a single run.

This is a 43.6-foot improvement over the previous world record, which was achieved last year on the NF-26 appraisal well.

The record-breaking core recovery was safely achieved on the Energy Embracer rig, which was drilling NF-25A well as part of the North Field Appraisal Project. NF-25A well is drilled and cored in the North Field Qatar, the largest non-associated natural gas field in the world.

This pace-setting success was achieved safely with high



The Energy Embracer rig team responsible for the new world record single-run core recovery of 777.58 feet.

quality of core samples through the diligence and dedication of a multi-functional team from QatarEnergy LNG, Energy Embracer, Baker Hughes, QatarEnergy and other service partners. The QatarEnergy LNG, QatarEnergy and service partners worked closely to plan and execute the coring operation, considering North Field complex geological setting.

The record is another significant milestone for both QatarEnergy LNG and the oil and gas industry, which demonstrates the Company's commitment to safety, innovation and an unwavering ability to achieve new heights.

We extend our congratulations to the team on this outstanding achievement.

L&D Dept retains Gold Accreditation from Investors in People

QatarEnergy LNG's Learning and Development Department is awarded third 'We Invest in People' Gold Accreditation from Investors in People (IIP).

This significant achievement recognises QatarEnergy LNG's commitment to implementing well-established policies, procedures and systems that empower its employees to excel.

It is the third time the Company has achieved Gold accreditation, an internationally recognised standard for exceptional people management, having first received this prestigious recognition in 2018, and then again in 2020.

Notably, only 26% of IIP-accredited organisations worldwide have reached the Gold level, which underscores the department's effective leadership, support, and development of QatarEnergy LNG's high-calibre and diverse workforce, ultimately driving outstanding business results.

The award also serves as a measure of the impact of the Company's people strategy and its benefits for employees.

Understanding the value of people

Paul Devoy, Chief Executive Officer (CEO) of IIP, commended QatarEnergy LNG's Learning and Development Department, stating, "Gold Accreditation is a fantastic effort for any organisation, and places [QatarEnergy LNG] in fine company with a host of organisations worldwide that understand the value of people."

Key highlights of learning and development practices at QatarEnergy LNG include a comprehensive range of programmes, such as National Graduate Development, Technician Certificate, Non-Technical Trainee,



INVESTORS IN PEOPLE®
We invest in people Gold

Undergraduate Scholarship, and Leadership Programmes – all designed to develop the skills and capabilities of the Company's workforce.

Additionally, the Company implements a well-structured competence framework, ensuring that each position within the company is equipped with the necessary skills and expertise.

QatarEnergy LNG's L&D Department has also adopted automated processes such as SuccessFactors for Performance Management, Learning Management Systems, Technical Competence Assessments, Behavioural Competence Assessments, Professional Development Plans, Leadership Development Plans, succession planning, and recruitment.

Moreover, the utilisation of Individual Development Plan workflow and Training and Event Management System workflows for external training and development, enhance process efficiency. The IIP module encompasses three main categories: Leading, Supporting, and Improving, all of which are indeed deeply embedded in the department's operations.

QatarEnergy LNG remains committed to investing in its people and creating an environment where everyone can thrive. This Gold Accreditation reinforces the Company's dedication to continuous improvement, ensuring that exceptional learning and development opportunities are available to drive both individual and organisational success.

"Gold Accreditation is a fantastic effort for any organisation, and places QatarEnergy LNG in fine company with a host of organisations worldwide that understand the value of people."

– Paul Devoy, CEO, IIP.

QatarEnergy LNG recognised with Crystal Award for exemplary support of Qatarization

ENERGY SECTOR
QATARIZATION AWARDS

2022 AWARDS



His Excellency Mr. Saad Sherida Al-Kaabi, the Minister of State for Energy Affairs and the President and CEO of QatarEnergy, and QatarEnergy LNG CEO, Khalid bin Khalifa Al Thani, at the award ceremony.

QatarEnergy LNG proudly received the prestigious 2022 Crystal Award for Supporting Qatarization during the energy sector's Annual Qatarization Review Meeting, held under the patronage of His Excellency Mr. Saad Sherida Al-Kaabi, the Minister of State for Energy Affairs and the President and Chief Executive Officer (CEO) of QatarEnergy.

The Annual Qatarization Review Meeting, organised by QatarEnergy, honours organisations that have consistently demonstrated excellence in the four primary categories:

- Support and Liaison with the Education Sector

- Supporting Qatarization
- Support for Learning and Development
- Best Qatarization Progress.

QatarEnergy LNG was bestowed with the prestigious award in recognition of its outstanding Qatarization programme.

An employer of choice

Through its Qatarization programme, the Company has provided numerous development opportunities to the national workforce, including collaborating extensively with educational institutions and the Ministry of Labour (MOL) to optimise the recruitment of highly skilled Qataris.

Indeed, the MOL recently commended QatarEnergy LNG as one of the country's best supporters of Qatarization at the recent 'Employer Recognition' ceremony.

Such outreach has consistently been a priority for QatarEnergy LNG. The 'Hayyakum Outreach Programme' has successfully attracted talented Qatari students from high schools and universities, while partnerships forged with Qatar Foundation and Qatar University continue to facilitate the recruitment of highly talented national candidates.

The Company's range of comprehensive Qatarization programmes align with the goals of Qatar National Vision 2030 and are designed to emphasise 70% on-the-job experience and learning, 20% coaching and mentoring, and 10% formal courses and training.

QatarEnergy LNG remains committed to advancing Qatar's national workforce and will continue to set new benchmarks for excellence in the energy sector.

Consistency in Qatarization

QatarEnergy LNG has been awarded the Qatarization Crystal Award for the past four consecutive years and received a certificate of recognition in 2018 for Support and Liaison with the Education Sector.

- 2019 - Crystal Award: Support for Training and Development
- 2020 - Crystal Award: Support for Training and Development
- 2021 - Crystal Award: Best Qatarization Progress
- 2022 - Crystal Award: Supporting Qatarization

Exceptionally high standards at Plant Design contest

QatarEnergy LNG sponsored and presented the best overall prizes to the winning teams at the 19th Annual Plant Design Competition, organised by the Department of Chemical Engineering at Qatar University.

The 19th Annual Plant Design Contest took place on 21 May 2023 at Qatar University's Ibn Khaldoun Auditorium. With a proud legacy dating back to 2004, this annual contest aims to provide students with world-class engineering experience, furthering their knowledge and skills.

This year's senior design projects featured 11 female teams and four male teams and showcased exceptional standards. The judges panel, led by Rashid Al-Anzi, Lead of Process Engineering, South Non-LNG, QatarEnergy LNG, unanimously selected the top three teams.

First place:

- Amna Mohamed Inthikaf, Alyaa Adil Elseed and Bisan Aljaoni for their design of a company which utilises state-of-the-art technology, ACETICA, to produce approximately 400,000 tonnes per annum of acetic acid. The team was supervised by Dr. Zeinab Abbas Jawad.

Second place:

- Shaymaa Kaid Alyafei, Shahad Akram Hassan Elhamaidah and Almaha Sultan Al-Jehani who proposed a company for manufacturing dimethyl ether, while adhering to sustainability standards using cleaner resources and energy conservation. Dr. Seckin Karagoz supervised the team.

Third place:

- Manisha Karim, Patricia Silang Magdia, and Priyanka Pant Chhetri for their design of an outstanding gas-to-liquid (GTL) facility that converts natural gas into high-quality and environmentally-friendly liquid hydrocarbons, primarily diesel, kerosene, and naphtha. Dr. Saad Al Sobhi supervised the team.

QatarEnergy LNG's Abdulla Radi Al-Hajri, Integrity & Reliability Engineering Manager, and Dr. Rashid Sultan Al-Kuwari, Asset & Surveillance Engineering Manager, presented the prizes to the winning teams during a ceremony held at the Company's Doha Head Office.

Encouraging tomorrow's innovators

Supporting education is a key element of QatarEnergy LNG's Corporate Social Responsibility initiative. The Company believes that partnerships between academic institutions and the industry help students develop into professionals who will contribute and innovate in the future.

Professor Fadwa Tahra Eljack, a distinguished faculty member in Chemical Engineering at Qatar University, thanked QatarEnergy LNG and its management on behalf of the College of Engineering, adding, "The Plant Design Competition has become the flagship event of our department, eagerly anticipated by senior chemical engineering students each year.

"The invaluable engagement of industry professionals in our senior design projects provides students with unique opportunities to interact with experts in their field, gaining invaluable insights into the technical and operational challenges they may encounter."



The winning entrants at the 19th Annual Plant Design Competition, supported by QatarEnergy LNG.

Prioritising Circular Economy for Waste Management Success at QatarEnergy LNG

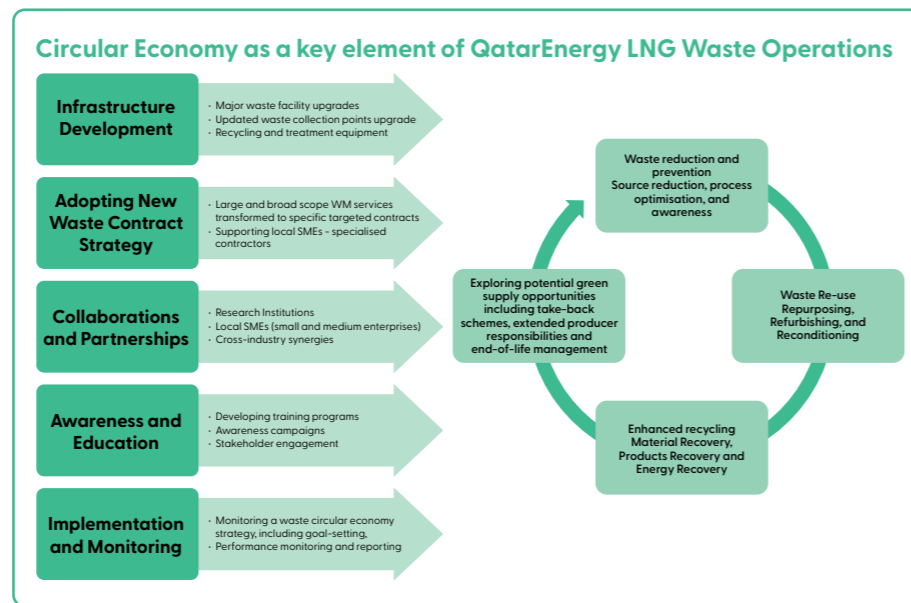
Company makes considerable inroads in implementing environmentally sustainable and cost-efficient waste operations by integrating circular economy strategies.

In recent years, there has been a substantial paradigm shift towards sustainability and circular economy in global business and industry. These concepts have been embraced by responsible operators within the energy sector as a necessary vision of the future.

Sustainability and the circular economy are also recognised and highlighted in the Qatar National Vision (QNV) 2030, which advocates for Environmental Development as one of the fundamental pillars of Qatar's future, along with sound economic management and the responsible exploitation of the country's hydrocarbon resources.

The QatarEnergy LNG Environmental Strategy and Implementation Roadmap, introduced in 2022, provides a pathway for the Company to achieve these QNV 2030 objectives and beyond. One of the Company's primary strategic goals is to achieve more than 70% recycling of all operational waste streams and transition to a circular economy model where every waste stream is considered a resource and therefore has a value that can be utilised, reused or recycled. This essentially means that "one's waste is someone else's resource" and that those resources, albeit finite, can be circulated in extended loops of production cycles. Hence, a range of used and waste materials can expand their useful lives considerably.

The circular economy model can also be interpreted as the next holistic phase of the '4Rs' (Reduce, Reuse, Recycle and Responsible Disposal), principles followed by QatarEnergy LNG in its waste management operations. This expands the Company's focus to look beyond the single waste stream and single activity approach, into complete, integrated cycles and meaningful interactions between them.



The Company's primary focus is to explore and establish local cross-industry partnerships and collaborate with in-country Small and Medium-sized Enterprises (SMEs) to develop waste recycling and upcycling solutions that will be sustainable, economically viable and environmentally beneficial.

In practice, the circular economy approach has allowed QatarEnergy LNG for implement sustainable solutions to a variety of materials that would otherwise be landfilled, ending their useful life cycles, with no economic or environmental benefit to the community.

Since 2018, the Company has prioritised the circular economy approach for a number of previously landfilled waste material streams, researching and identifying best practicable circular solutions with a potential to create in-country economic and environmental value.

This has created highly successful solutions within the principles of sustainability and circular economy, including those for molecular sieves, contaminated sulfur, various hydrocarbon waste streams and several other streams (as shown on page 21).

Enabled by QatarEnergy LNG and its SME partners, these solutions are now embedded into the State of Qatar's ever-expanding loops of circular economy and demonstrate the Company's commitment to QNV 2030 objectives.

Our sustainability and circular economy journey will continue enhancing existing partnerships and further expanding collaborations with local research institutions, SMEs and shareholders, in order to achieve the ambitions and objectives of the QatarEnergy LNG Environmental Strategy.

Success story - Molecular Sieves/Catalyst Recycling for cement production

The Molecular Sieves solution began in 2019 with cross-industry cooperation with a local cement factory, which now utilises QatarEnergy LNG molecular sieves as source material for its base product, 'clinker', which is the main component of cement.

This process was enabled through joint research with the local cement SME to prove its feasibility and to secure the necessary regulatory approvals to implement. Following QatarEnergy LNG's pioneering effort, this solution has now become well established and is also used by other energy operators in Qatar.

LANDFILL

- Treatment requirement for landfilling
- Possible contamination of soil, groundwater
- Increased waste
- Loss of resources
- Occupational health hazards

CO-PROCESSING

- Helped recycle a waste stream that would otherwise be landfilled
- Minimise environmental impact
- Conserve resources
- 85% reduction in cost**
- Increase in QatarEnergy LNG waste recycling rate
- Since January 2020, we have recycled more than **12,500 Tonnes** of Mol Sieves and Catalyst

RAW MILLING

Raw material analysed through on-line Gamma analyser and ground by vertical roller mill, in which mixture is reduced to fine powder and dried.

Grounded finer raw materials then blended homogeneously together in silos to produce "Raw Meal".

CLINKER PROCESSING

Raw material fed into preheater and rotary kiln where material heated at 1300 degrees Celsius and then cooled rapidly.

This chemical process transforms the material into "Clinker"

CEMENT MILLING

Clinker + Gypsum ground together into fine powder within vertical roller mills to produce cement as final product.

Gypsum is added to control cement setting times.

LANDFILL

- Potential environmental pollution
- Health hazards
- Resource depletion – valuable resource are being wasted
- Economic losses – not creating revenue stream

RECYCLING

- Reduced environmental impact**
- Cost benefits**
- Increased efficiency**
- Enhanced reputation**
- Since January 2021, we have recycled more than **1,500 Tonnes** of hydrocarbon waste streams

2018

- Lube Oil (single stream)

2022/2023

- Waste lube oil
- Hydraulic oil
- Waste hydrocarbons from skimming operations
- Tank cleaning activities waste
- Contaminated naphtha, kerosene, diesel

Success story - Hydrocarbon Waste Stream Recycling

QatarEnergy LNG's hydrocarbon recycling solution began in cooperation with a newly established local SME, which had a limited initial focus on the treatment and re-use of the Company's used lube oil stream only.

However, this partnership led to further research and successful trials with a wide range of other hydrocarbon waste materials, including those generated from sludge separation, tank decanting, and other similar QatarEnergy LNG processes as well as contaminated hydraulic oil, naphtha, diesel and kerojet.

This collaboration has now resulted in the majority of the Company's diverse hydrocarbon waste streams are recycled by the SME locally, providing financial and social benefits of expanding production cycles within the country.

LANDFILL

- Treatment requirement for landfilling
- Possible contamination of soil, groundwater
- High treatment cost per ton
- Occupational health hazards

RECYCLING

- Helped recycle a waste stream that would otherwise be landfilled
- Reduced environmental impact
- Cost savings
- 95% reduction in cost**
- Improved reputation**
- Since January 2020, we have recycled more than **1,037 Tonnes** of waste sulfur

Powder Granule Pastile Lump

2018

- Lube Oil (single stream)

2022/2023

- Waste lube oil
- Hydraulic oil
- Waste hydrocarbons from skimming operations
- Tank cleaning activities waste
- Contaminated naphtha, kerosene, diesel

Success story - Recycling of waste Sulfur for production of Sulfuric Acid

Contaminated sulfur that was previously neutralised and disposed of at hazardous waste landfills has instead become a source for sulfuric acid production at a local manufacturing plant.

This partnership with a local SME was built on mutual understanding of the intrinsic value that waste sulfur possesses and conducting research and field trials to confirm the technical feasibility of utilising this spent sulfur for sulfuric acid production. The successful partnership has led to a reduction of approximately 95 % in spent sulfur that was previously landfilled while supporting the local sulfuric acid market and in-country industry.

LANDFILL

- Treatment requirement for landfilling
- Possible contamination of soil, groundwater
- High treatment cost per ton
- Occupational health hazards

RECYCLING

- Helped recycle a waste stream that would otherwise be landfilled
- Reduced environmental impact
- Cost savings
- 95% reduction in cost**
- Improved reputation**
- Since January 2020, we have recycled more than **1,037 Tonnes** of waste sulfur

Powder Granule Pastile Lump

Measuring methane emissions using drone-based sensors

QatarEnergy LNG partners with TotalEnergies to conduct first-of-its-kind airborne methane monitoring campaign in Qatar.

The State of Qatar, through QatarEnergy, has subscribed to the Oil and Gas Methane Partnership (OGMP 2.0), the only comprehensive, measurement-based global methane reporting framework for the energy industry. Members of the OGMP 2.0 partnership aim to improve the accuracy and transparency of methane emission reporting, with more than 70 companies and 30% of the world's oil and gas producers participating.

The OGMP initiative was established to help bridge the gap observed by the United Nations Environmental Program (UNEP), when comparing global measurement-based methane data versus the methane emissions reported by industries and countries, which is primarily based on estimates and emission factors.

The case for measurement-based methane data

The overarching premise of OGMP 2.0 is based on the fact that methane emissions cannot be effectively

managed or controlled unless they are measured. The initiative itself has five levels of reporting with participating companies required to enhance their methane reporting to achieve Level 4 (source-based measurements) and Level 5 (site-based measurements) which are regarded as the OGMP's Gold Standard.

As part of its OGMP roadmap, the Company is not only implementing a range of initiatives that minimise its methane footprint but also gathering data using traceable, validated and reliable measurement methodologies. These include drone-based sensors, utilised for Level 4 (source-level measurements) reporting, and satellite monitoring, used for Level 5 (site-level measurements) reporting.

A landmark monitoring campaign

A recent joint pilot campaign was conducted by QatarEnergy LNG at its facilities located in Ras Laffan Industrial City, in collaboration with TotalEnergies.

With TotalEnergies' state-of-the-art Airborne Ultralight Spectrometer for Environmental Applications (AUSEA) technology attached to a drone, as many as 34 flights were made over 13 flying hours, covering 184 kilometres of total flight distance to measure source-based methane emissions from QatarEnergy LNG's N2 LNG asset.

AUSEA comprises an advanced analyser, an infrared spectrometer capable of precisely detecting methane and CO₂ emissions as low as one kilogram per hour (kg/h) allowing for accurate measurement in real-time.

The drone's flight is a meticulous process calculated using advanced LIDAR (Light Detection and Ranging) technology and expert direction by TotalEnergies' AUSEA operator, involving flights upwind and downwind of emission plumes from LNG plant sources. The use of real-time spectrometer analysis combined with a perpendicular flight path, ensured comprehensive coverage and accurate data collection from QatarEnergy LNG's N2 facility for thorough analysis.



AUSEA methane drone measurements at the QatarEnergy LNG N2 Flare.



AUSEA methane drone technology demonstration.



AUSEA methane drone technology demonstration for QatarEnergy and Ras Laffan Industrial City (RLC) Operators.