

Qatargas offshore introduction.

Qatargas Operations Offshore

Qatargas operates all its existing trains and facilities, including offshore, on behalf of its shareholders in all of its assets:

- Qatargas 1
- Qatargas 2
- Qatargas 3
- Qatargas 4

The Qatargas offshore operations are located approximately 80 kilometers northeast of Qatar's mainland. For Qatargas 1, twenty-two production wells have been drilled and completed to supply 1,600 million standard cubic feet (45 million cubic meters) of dry natural gas per day from the field's reservoir, underneath the seabed, to the existing Qatargas 1 onshore trains. For Qatargas 2, thirty wells were drilled, which supply 2.9 billion standard cubic feet of wet natural gas per day to Trains 4 and 5 onshore.

Qatargas 3 and Qatargas 4 supply 1.4 billion standard cubic feet of wet natural gas per day each to onshore Trains 6 and 7 respectively. A total of 33 wells are shared between the two ventures. The North Field Bravo offshore complex is the heart of the Qatargas offshore operation. Commissioned in 1996, the main facilities in this complex include living quarters, two production facilities platforms, three wellhead platforms (two of which are connected by bridges to the production facilities) and one remote platform located about five kilometres away.

The three platforms installed for Qatargas 2 are remotely operated from North Field Bravo, while the three, which are shared between Qatargas 3 and Qatargas 4, are operated remotely from the onshore control room. Natural Gas from offshore is transferred to shore with the associated condensate via subsea pipelines.

Qatargas Operations Onshore

Qatargas is the largest LNG producing company in the world.

Qatargas' onshore operations occupy a site within Ras Laffan industrial City on a plot of land 3.9 square kilometres in area. The original plant consisted of only three trains to process the natural gas from offshore into the export product known as Liquefied Natural Gas (LNG). The capacity of these first three trains is 10 million tonnes per annum (MTA) of LNG.

Through step out technologies a new era of mega-trains began.

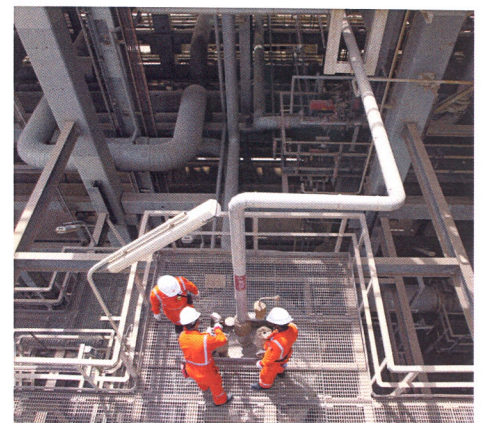
In 2009 the Qatargas' Trains 4 and 5, each with a capacity of 7.8 millions tonnes per annum (MTA) started operating, bringing the combined production capacity of Qatargas to 26 MTA.

In late 2010 Qatargas' Train 6 started producing LNG followed by Qatargas' Train 7 in early 2011. Qatargas' Trains 6 and 7 each have a capacity of 7.8 MTA. With the start of production of LNG from Qatargas' Train 7, Qatargas' overall production capacity is 42 million tonnes of LNG per annum.

The Process

The first step on the onshore facilities is the separation of condensate from gas. The separated condensate is stabilised and sent to storage to await export. The natural gas then flows to the liquefaction trains for processing into LNG. During the first phase of this process sulphur compounds carbon dioxide and water are removed in stages. The gas is then chilled using propane and mixed refrigeration processes.

The heavy hydrocarbons are separated out and fractionated into Liquefied Petroleum Gas (LPG) and plant condensate. The cryogenic main heat exchanger in each train then cools the gas to about minus 150 degrees Celsius liquefying it in the process. Finally as the pressure is reduced to almost zero the temperature then decreases to minus 162 degrees Celsius, nitrogen is removed and LNG is then transferred to one of the storage tanks prior to being loaded into ships.





Qatargas 2

The Qatargas 2 (QG2) project is the world's first fully integrated value chain LNG venture.

The World's first integrated LNG project

QG2 includes two world class LNG mega-trains each with a capacity of 7.8 million tonnes per annum (MTA) of LNG and 0.85 MTA Liquefied Petroleum Gas (LPG), condensate production of 90,000 bpd, a fleet of 14 Q-Flex and Q-Max ships and Europe's largest LNG receiving terminal.

In April 2009, this QG2 project was inaugurated in a special ceremony in Doha by His Highness the Emir Sheikh Hamad Bin Khalifa Al Thani, in the presence of His Royal Highness The Duke of York, Prince Andrew. The receiving terminal, South Hook, was inaugurated in the UK five weeks later in May 2009 by His Highness The Emir of the State of Qatar in the presence of Her Majesty the Queen.

QG2 includes 30 offshore wells and three platforms in Qatar's North Field. The offshore platforms are unmanned and produce 2.9 billion cubic feet of gas per day. Total production is piped to shore via two wet-gas pipelines. The Liquefied Natural Gas is processed using Air Product's proprietary APX process technology.

As part of the total expansion of Ras Laffan capacity Qatargas 2 also led to the construction of facilities for expanded LNG storage and loading, including five 145,000 cubic metre tanks and three LNG berths, a 12,000 tonne/day common sulphur system serving all Ras Laffan ventures and an export pipeline and mooring buoy for loading condensate ships some 55 kilometres offshore.

Once the gas is processed and turned into LNG, it is loaded and shipped in a specially designed fleet of ships to markets in the United Kingdom, United States, Asia and Europe. Upon arrival in the United Kingdom, the LNG is off-loaded into a purpose built LNG receiving Terminal, South Hook, at Milford Haven, Wales. The terminal is the largest LNG receiving terminal in Europe and is linked to the UK's national pipeline grid serving approximately 20% of the current UK natural gas demand.



Qatargas 3

The Qatargas 3 (QG3) project involved the construction of a new LNG mega-train (Train 6) with a capacity of 7.8 million tonnes per annum (MTA).

Economies of scale

The LNG produced by QG3 is transported to market on a fleet of ten ships each with a capacity of approximately 210,000 - 266,000 cubic metres. The upstream platforms and infrastructure consist of three unmanned platforms, 33 wells and two subsea pipelines, all of which are shared with the Qatargas 4 project. Qatargas 3 produces 1.4 billion standard cubic feet of gas per day, delivering LNG and substantial volumes of condensate and LPG.

Qatargas 3 utilises the same Air Products proprietary APX process technology as Qatargas 2. This helps to achieve economies of scale and integration which puts Qatargas ahead of its competitors. The Qatargas 3 and Qatargas 4 projects were developed and executed by a joint asset development team to capture synergies between the two projects.

QG3 Train 6 will ship its LNG predominantly to the United States, Asia and Europe. At full operational capacity, the train is capable of providing approximately one billion cubic feet of gas per day for 25 years.



Qatargas 4

Qatargas 4 (QG4) which started producing LNG in January 2011 completes Qatargas' planned LNG expansion projects.

Completing the vision

The project QG4 involved the construction of a new LNG mega-train (Train 7), similar to Qatargas 2 and Qatargas 3 with a production capacity of 7.8 MTA.

The upstream platforms and infrastructure consist of three unmanned platforms (each containing 11 wells) and two subsea pipelines, which are shared with Qatargas 3. Qatargas 4 will produce 1.4 billion standard cubic feet of gas per day delivering LNG and substantial volumes of condensate and LPG, as well as high purity grade sulphur.

QG4 utilises the same Air Product's proprietary APX process technology as QG2 and QG3, helping to achieve economies of scale and integration not previously possible in the LNG industry.

The QG3 and QG4 projects were developed and executed by a joint asset development team to capture synergies between the two projects.

The LNG from QG4 will be transported to global markets via a fleet of eight Q-Flex or Q-Max ships (approximately 210,000 - 266,000 cubic metres capacity each) that have been constructed in Korean shipyards. Qatargas' seventh train will predominantly supply North America, the Middle East and Asia.

A new generation of LNG ships

Qatargas pioneered the development of two new classes of LNG ships.

Referred to as Q-Max and Q-Flex, the ships were designed by a team of engineers making a quantum leap in the capacities of LNG carriers.

Each ship has a cargo capacity of between 210,000 and 266,000 cubic meters and is up to 80 percent larger than the current LNG carriers. A total of 32 of these ships (19 Q-Flex and 13 Q-Max) have been delivered for Qatargas. These new vessels have many innovative features to maximise cargo deliveries and to ensure the highest levels of safety and reliability. Among them are:

- A 'membrane' type cargo containment system.
- Twin engines and shafts to ensure maximum propulsion safety and reliability, with reduced environmental footprint and twin rudders to ensure safety of navigation and manoeuvrability in confined waters.
- Slow speed diesel engines which are more thermally efficient than steam turbines and therefore burn less fuel, which will produce 30 percent lower overall emissions compared to traditional existing LNG carriers.

- Cargo re-liquefaction plants return boil-off to the cargo tanks and therefore maximise the cargo outturn at the discharge port.
- Underwater coatings using the latest technology silicon anti-fouling system, which not only enhances the speed and performance of the vessel, but is also "friendly" to the marine environment since it does not release any biocides into the sea to prevent marine growth on the hull.
- Fire fighting specification calling for combinations of Hi-Ex foam, Hi-fog water systems and safer and cleaner fire extinguishing agents to eliminate the need for CO₂ - a first for LNG ships.

The ships were constructed at three building yards in South Korea at Hyundai Heavy Industries at Ulsan, Samsung Heavy Industries (SHI) and Daewoo Shipbuilding & Marine Engineering (DSME) on Geoje Island.

Qatargas is the first ever LNG recipient of the 'Green Award' presented by the Green Award Foundation, in recognition of our proven environmental practices demonstrated in our dedication to high quality, safety and environmental standards in conjunction with our LNG fleet.



Customers and markets

The world's largest LNG producing company - Qatargas now produces three main products for export; LNG, condensate and sulphur. In addition, helium and LPG are sold by us.

With the successful completion of all the Qatargas expansion projects, Qatargas is now exporting these products to every corner of the world from its world class facilities in Qatar - Qatargas 1; Qatargas 2; Qatargas 3; Qatargas 4 and Laffan Refinery.

Natural gas is increasingly becoming the fuel of choice for customers around the world due to its clean-burning and lower emission qualities. LNG is a way of delivering natural gas around the world, safely and reliably.

The buyers in Japan were the foundation customers for the development of the original Qatargas trains. Today, Qatargas is supplying to a number of companies in Japan, the majority of these are power and gas utility companies which supply gas and electricity to millions of domestic users in the Japanese market.

In recent years Qatargas has signed agreements for the long term supply of Qatari LNG to many new markets in addition to having supplied spot cargoes.

Today Qatargas is supplying LNG to all corners of the globe from Asia to Europe to North and South America.

With the start of production from Qatargas' seventh LNG train in early 2011, Qatargas has an overall production capacity of 42 million tonnes per annum (MTA) from a total of seven trains. This significant achievement is matched by Qatargas' commitment to continue to meet the expectations of every customer in every market around the world.

LNG IS A WAY OF DELIVERING
NATURAL GAS AROUND THE
WORLD, SAFELY AND RELIABLY

LNG Facts & Figures

QATARGAS 1

Owners:

Qatar Petroleum (65%)
ExxonMobil (10%)
Total (10%)
Mitsui (7.5%)
Marubeni (7.5%)

Train Capacity:

Three trains of 3.3 MTA each
First LNG Cargo Sent: 1996

Ships:

12 ships, 135 km³ capacity each

Intended Main Markets:

Japan, Spain

QATARGAS 2

Owners:

Train 4
Qatar Petroleum (70%)
ExxonMobil (30%)

Train 5

Qatar Petroleum (65%)
ExxonMobil (18.3%)
Total (16.7%)

Train Capacity:

Two LNG trains of 7.8 MTA each
First LNG Cargo Sent: 2009

Ships:

14 state-of-the-art large LNG carriers

Intended Main Markets:

United Kingdom, Europe and Asia

QATARGAS 3

Owners:

Qatar Petroleum (68.5%)
ConocoPhillips (30%)
Mitsui (1.5%)

Train Capacity:

One LNG train of 7.8 MTA
First LNG Cargo Sent: 2010

Ships:

10 state-of-the-art large LNG carriers

Intended Main Markets:

USA, Asia

QATARGAS 4

Owners:

Qatar Petroleum (70%)
Royal Dutch Shell (30%)

Train Capacity:

One LNG train of 7.8 MTA
First LNG Cargo Sent: February 2011

Ships:

8 state-of-the-art large LNG carriers

Intended Main Markets:

USA, Asia and Europe