

## The Terminal: how it works

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**The Adriatic LNG terminal** is the world's first offshore reinforced concrete structure for the reception, storage and regasification of liquefied natural gas (LNG).

Located in the high Adriatic Sea approximately 15 kilometres off the Venetian coast and with a **regasification capacity of 8 billion m<sup>3</sup>/year** (equal to half of the domestic import capacity of LNG), it provides nearly **10% of the national natural gas consumption**.

### Regasification in the Liquefied Natural Gas supply chain

The LNG supply chain consists of 4 phases: extraction, gasification, transport, and regasification.

Natural gas is extracted by drilling from underground deposits. The world's natural gas resources are vast and distributed across the globe: according to the latest estimates, the recoverable reserves of conventional gas should reflect more than 120 years of production.

Extracted gas reaches the liquefaction plants by pipeline. The plants act as large coolers, and are set up in parallel processing units, called "trains". In these structures, natural gas is liquefied through a cooling process at cryogenic temperatures (approximately -162° C) at atmospheric pressure, reducing its volume by 600 times. The gas can thus be transported in large quantities by ship to consumer countries in the form of liquefied natural gas (LNG).

Here, at the regasification terminals positioned on the coast (onshore) or - as in the case of Adriatic LNG - offshore, LNG is converted from the liquid to the gaseous state by means of a controlled heating process.

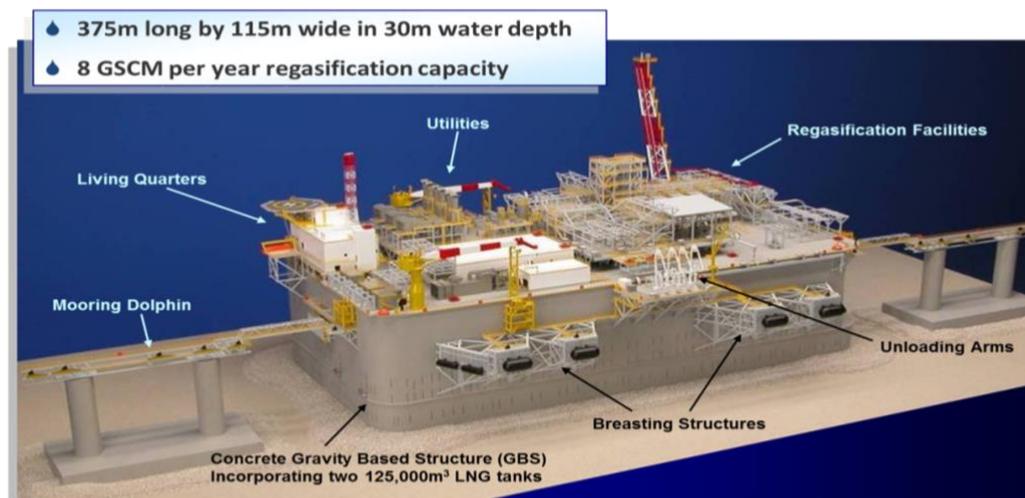
At the end of the regasification process, the gas, now returned to its original volume, is channelled into the national pipeline network through a pipeline.

### The Adriatic LNG terminal:

The offshore terminal is comprised of:

1. a reinforced concrete structure (Gravity Based Structure - GBS)
2. two LNG storage tanks (within the GBS)
3. a regasification plant
4. structures for mooring and unloading of LNG carriers
5. quarters for personnel
6. **a methane pipeline** connected to the mainland.

## Terminal Function and Design



- ◆ First concrete Gravity Based Structure (GBS) offshore LNG import terminal
- ◆ First application of Modular LNG storage tank technology
- ◆ First application of specially adapted LNG offloading arms

1. The main terminal structure in reinforced concrete (GBS - Gravity Based Structure) rests on the seabed at a depth of approximately 29 m. Manufactured in Campamento, Spain, it was built with 90,000 m<sup>3</sup> of cement and 30,000 tonnes of steel reinforcement. It is 180 m long, 88 m wide and 47 m high.
2. The **two modular tanks** of 125,000 m<sup>3</sup> each for LNG storage were designed with ExxonMobil technology and manufactured in South Korea.
3. **The regasification plant** is located on the top of the GBS, and includes:
  - a) four LNG vaporisers (using heat naturally contained in sea water)
  - b) a heat recovery LNG vaporiser (which reuses heat from gas turbines)
  - c) two cryogenic compressors
  - d) four pumps for the transfer of LNG from tanks
  - e) five pumps to send the gas into vaporisers and the pipeline.

The terminal also houses auxiliary equipment (for generating electricity with gas turbines and an electrical and instrumentation substation).
4. The **mooring facilities**, known as "Mooring Dolphins", were constructed in the Arsenale shipyard in Venice, and can accommodate LNG carriers of varying tonnage. Special output arms transfer the LNG from the ship to pipelines that send it to the terminal storage tanks.

5. **The terminal can accommodate up to 60 people on board** in living quarters that have been designed to include housing, offices, a fully equipped kitchen, medical facilities, a laundry room, a heliport, and communal areas for meals and leisure. The structure also includes a modern control room, from which operators monitor every aspect of the terminal, pipeline and gas metering station.
6. The **LNG pipeline** consists of an initial 30-inch, 40-km-long **pipeline** that runs for 15 km under the seabed and continues for 25 km inland to the Cavarzere (Ve) measuring station, and a second pipeline, owned by Infrastrutture Trasporto Gas, which transports the gas for 84 km to the national grid junction near Minerbio (Bo).

#### Ground operations base in Terra di Porto Viro

The ground operations base in Terra di Porto Viro (Ro) coordinates support activities for the movement of vehicles and technical and operational personnel to and from the terminal. The ground operations base consists of a 50,000 m<sup>2</sup> complex, a mooring dock for the shuttle boat to and from the terminal, offices and telecommunication systems that are in constant connection with the platform, and a warehouse for supplies and replacement material.

A heliport in operation 24 hours a day, 7 days a week, allows the terminal to be reached with a travel time of 8 minutes. The take-off and landing area is available to the community for any potential health emergencies or relief interventions. As an ENAC-certified private air-structure in the province of Rovigo, the heliport represents an important resource for the entire local community.

The base plays an important role as an interface between the Adriatic LNG and the local community.

#### Integrity and reliability of operations at sea and on land

The integrity and reliability of Adriatic LNG equipment, both that located on the terminal and land, are subject to maintenance, inspection and monitoring programs that ensure high levels of efficiency.