dunkerque LNG
fluxys

Introduction and major projects

Press kit | 2022

Dunkirk LNG terminal

On 21 June 2011, EDF and its partners Total and Fluxys launched the construction of the Dunkirk LNG terminal. The terminal has been in service since 8 July 2016, with the commercial commissioning conducted by shareholders on the 1st of January 2017.

On 30 October 2018, following a competitive auction process launched in early 2018, EDF and Total sold their interests in Dunkerque LNG. Fluxys is now the major shareholder in the Dunkirk LNG terminal, the second-largest LNG terminal in continental Europe after Barcelona.

EDF and Total remain the main customers of the Dunkirk LNG terminal through 20-year "ship or pay[1]" contracts. Of an annual regasification capacity of 13 billion m^3, 9.5 are reserved for EDF and Total in the long term, and 3.5 are put on sale through a bond issue.

1. "Ship or pay": These contracts mean that customers pay regardless of their use of the terminal, enabling the terminal's services to be used flexibly.

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1. Introduction

Structure

Shareholding

The Dunkirk LNG terminal is currently owned and operated by Dunkerque LNG, a company 61% owned by a consortium made up of gas infrastructure group Fluxys, AXA Investment Managers-Real Assets, acting as an agent for their clients, and Crédit Agricole Assurances, and 39% owned by a consortium of Korean investors led by IPM Group in cooperation with Samsung Asset Management.

Fluxys is a completely independent gas infrastructure group which operates throughout Europe. The Group's offer combines gas transport and storage with LPG terminalling. It is contributing to a sustainable energy future as its dedicated teams provide the market with reliable, affordable energy sources. Fluxys has 40 years' experience of working with LNG. Its holdings and partnerships in LNG include the Dunkirk, Zeebrugge and Revithoussa LNG terminals along with an LNG bunkering vessel. Its other holdings and partnerships include gas transport and storage facilities in Belgium, the Interconnector and BBL gas pipelines linking the United Kingdom to mainland Europe, the NEL and TENP gas pipelines and the EUGAL gas pipeline project in Germany, the Transitgas pipeline in Switzerland, the DESFA gas transport infrastructure in Greece, and the TAP pipeline under construction between Turkey and Italy.
www.fluxys.com

AXA Investment Managers - Real Assets, a world leader in investment. Real Assets is the leader in the management of property portfolios and assets in Europe, managing more than 77 billion euros in assets, including 58.6 billion euros of direct investment in real estate and infrastructure, and 14.8 billion euros in real asset financing (end of June 2018). It offers a 360° approach to Real Asset investment, including opportunities in equity and debt, in various regions and sectors, and via private or listed instruments. Its teams have been managing funds and accounts for more than 30 years and number more than 600 staff in 14 offices, operating in more than 20 countries worldwide. They provide in-depth knowledge of these countries, towns and sectors.
www.realassets.axa-im.com

Crédit Agricole Assurances, an European leader in bank insurance, brings together the insurance subsidiaries of Crédit Agricole. The group offers a range of products and services covering savings, pensions, health, life assurance and property insurance. They are marketed through the banks of the Crédit Agricole group in France and by asset management advisers and general advisers in nine other countries worldwide. The Crédit Agricole Assurances companies cater for individuals, professionals, farmers and businesses. Crédit Agricole Assurances has 4,400 employees. Its turnover at the end of 2017 amounted to 30.4 billion Euros (IFRS standards).
www.ca-assurances.com

InfraPartners Management ("IPM") is a global consultancy and fund management company, set up in 2014 by a group of experienced investment professionals. IPM has headquarters in London, Seoul and Bratislava, and operates in the United States and Turkey. IPM specialises in alternative asset funds, including infrastructure, risk capital, investment capital and raw materials. IPM's aim is to create a positive economic impact and long-term value for its clients, the companies it invests in and the communities in which it operates.
www.ipmllp.com

Samsung Asset Management, an asset management subsidiary of the Samsung group, is the largest asset manager in Korea. Founded in 1998, Samsung Asset Management has been serving investors for 20 years. In late 2017, it had more than 200 billion USD of assets under its control, managed by a team of more than 350 investment professionals spread over offices in Seoul, Hong Kong, New York, London and Beijing. Samsung Asset Management has invested in worldwide infrastructure projects covering the Asia-Pacific region, Europe, North America and Latin America.
www.eng.samsungfund.com

Owner and operator

Dunkerque LNG is the owner and legal operator of the installation.

Gaz-Opale, a subsidiary 51% owned by Dunkerque LNG and 49% by Fluxys, operates the terminal. The latter is in charge of day-to-day operations at the terminal.

A flexible solution for their customers

Dunkirk LNG terminal offers major advantages to its customers:

- one of the largest on-terminal storage capacities in Europe;
- diversification and security of supply for the French and European markets;
- a new maritime landing-point for LNG in France;
- a location at the heart of Europe, at the cross-roads of maritime routes through the English Channel and the North Sea and close to natural gas consumer markets in France and North-West Europe;
- a direct connection to two European markets (France and Belgium);
- a deep-water port making it accessible all year round;
- genuine upstream flexibility to handle all sizes of ship from 5,000 m^3 to 265,000 m^3.
- downstream flexibility feeding the network upon customer request.

The innovative design of the terminal allows optimisation of both the upstream (through gas import contracts) and downstream (output to network) markets through the allocation of firm rights:

- a number of slots (loading or reloading times);
- a storage capacity;
- a minimum and maximum output.

Dunkerque LNG has developed a flexible and competitive service with its customers at the heart of terminal operational management. Certain more specific services are also offered to meet the needs of all of its customers:

- filling gas tanker holds (gassing up);
- cooling gas tanker holds (cooling down);
- inerting gas tanker holds (inerting);
- unloading excess volumes.

Dunkirk LNG terminal jetty

Location

Dunkirk's LNG terminal is located in the Western Port on a 56-hectare site, equivalent to 80 football pitches, of which 20 hectares have been reclaimed from the sea. It is located on the Clipon site, an artificial dune created around thirty years ago when the Western Dunkirk outer port was created, on the Loon-Plage commune. Prior to construction, the contracting agent conducted all necessary consultation work at local level. The concerns expressed during the public debate held in 2007, and the decision to make this large industrial project an example of how environmental requirements can be integrated, led to a number of key technical decisions. These relate in particular to the location of the terminal. The site was therefore moved to the west to preserve sensitive areas.

Compensation measures were also taken by Dunkerque LNG:

- the construction of a habitat for migratory birds on the Gravelines commune, covering an area of 20 hectares, named the "Hems Saint - Pol sensitive natural area";
- the creation of an area located within the confines of the Gravelines nuclear power station, for the preservation of biodiversity, covering an area of 4.5 hectares.

Management of these two areas has now been handed over to the Nord departmental council.

Hems Saint-Pol sensitive natural site

Other installations, implemented by the Dunkirk Major Sea Port and managed by the Nord departmental council, are located adjacent to the site of the terminal:

- the reconstruction of wild bird habitats and dune ecosystems; the constitution of a preservation area at Clipon Est, including the creation of salt marshes used by birds as a feeding zone;
- the creation of a preservation area, which complements Dunkerque LNG's second measure and provides access arrangements for anglers.

Also, a non-CO2-producing regasification solution was adopted, using 5% of the warm water produced by the Gravelines nuclear power station. This measure gives a maximum saving of 436,000 tonnes of CO2 a year. All of the compensatory environmental measures are covered by a order of the prefect dated 31 July 2009.

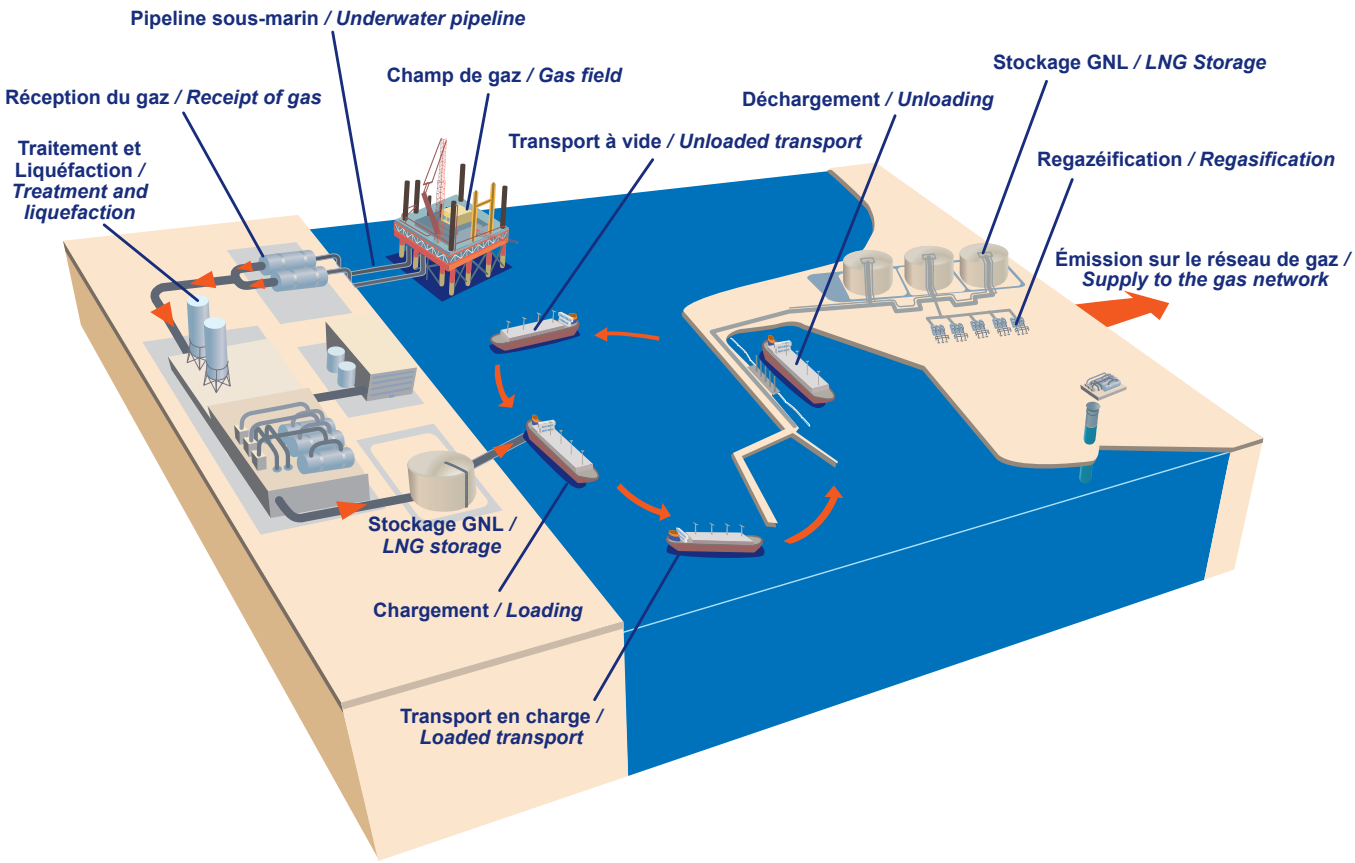
2. Operation of the terminal

Liquefaction and transport of liquefied natural gas

Natural gas is a fossil fuel, made up of a mixture of gaseous hydrocarbons found in numerous underground reserves. It has a lower CO_2 content than other hydrocarbons and is experiencing a major boom linked to increased collective awareness of environmental problems.

The gas, once it has been extracted, can be transported in two ways: in gas form through a gas pipeline or in liquid form. In the latter case, the gas is liquefied by cooling it to a very low temperature (-160°C), so that it occupies a much smaller volume. Liquefied natural gas (LNG) takes up 600 times less space than in its gaseous form. The LNG in the terminals and storage tanks is stored at close to atmospheric pressure. This liquefaction enables diversity of gas supply. LNG is clear, odourless, non-toxic and non-corrosive.

The transportation of LNG by ship gives greater flexibility of supply and improved cost for distances greater than 3,000 km. The LNG chain also means gas can be transported in complete safety when transport by pipeline is not possible or when the distance between the production site and point of consumption is too great.



There are three steps in the GNL chain:

- liquefaction of the gas;
- transport in tankers;
- receipt at LNG terminals where the LNG is stored then regasified prior to transport and distribution.

The stage before liquefaction is the most sensitive in the exploitation of the natural gas in liquid form but, as it takes place near to the production site, it does not concern activities at the Dunkirk LNG terminal.

The methane tankers, 200 to 350 metres in length, have a reinforced hull. The internal tanks are equipped with an insulating inner coating. The majority of vessels use the small proportion of the LNG which evaporates as a supplement to their propulsion fuel. The capacity of LNG tankers generally ranges between 70,000 m^3 and 155,000 m^3, while the largest LNG tankers in the world, the Qmax, have a capacity of 265,000 m^3.

An LNG terminal is a port installation which enables tankers to be taken in and unloaded. It comprises:

- unloading and reloading facilities[2] (docks and swinging arms);
- storage facilities: LNG is transferred into cryogenic tanks (kept at a temperature of -162°C and at atmospheric pressure);
- facilities for supplying the gas transport network.

Natural gas is a colourless and odourless gas. Odorisation of gas, for use as town gas for example, is an artificial process carried out outside the LNG terminal.

The Al Dafna, the first Qmax received by the teams at the Dunkirk LNG terminal
November 19, 2017

Small-scale LNG

LNG is also transported on a smaller scale. This provides for the use of LNG as a fuel and the transportation of energy over shorter distances or to areas without access to electricity, which are not connected to a transportation or gas distribution network.

Logistics is developed around activities involving the loading and unloading of GNL to and from other means of transport, such as tanker trucks or "bunkering" vessels whose function is to supply larger vessels powered by LNG.

This is because liquefied natural gas can also be used as a fuel, particularly for heavy goods vehicles (for fuelling private vehicles, natural gas tends to be used in gaseous form at a pressure higher than 200 bar). When used in this way for land vehicles, it produces 96% fewer fine particles and 70% less nitrogen oxide than a diesel engine during combustion.When used in ships, it reduces CO_2 emissions by 23%, sulphur by 99%, fine particles by 91% and nitrogen oxide by 92% compared to heavy fuel oil. Its value is demonstrated by the International Maritime Organization directive aiming to reduce sulphur emissions from ship fuels from 2020 onwards.

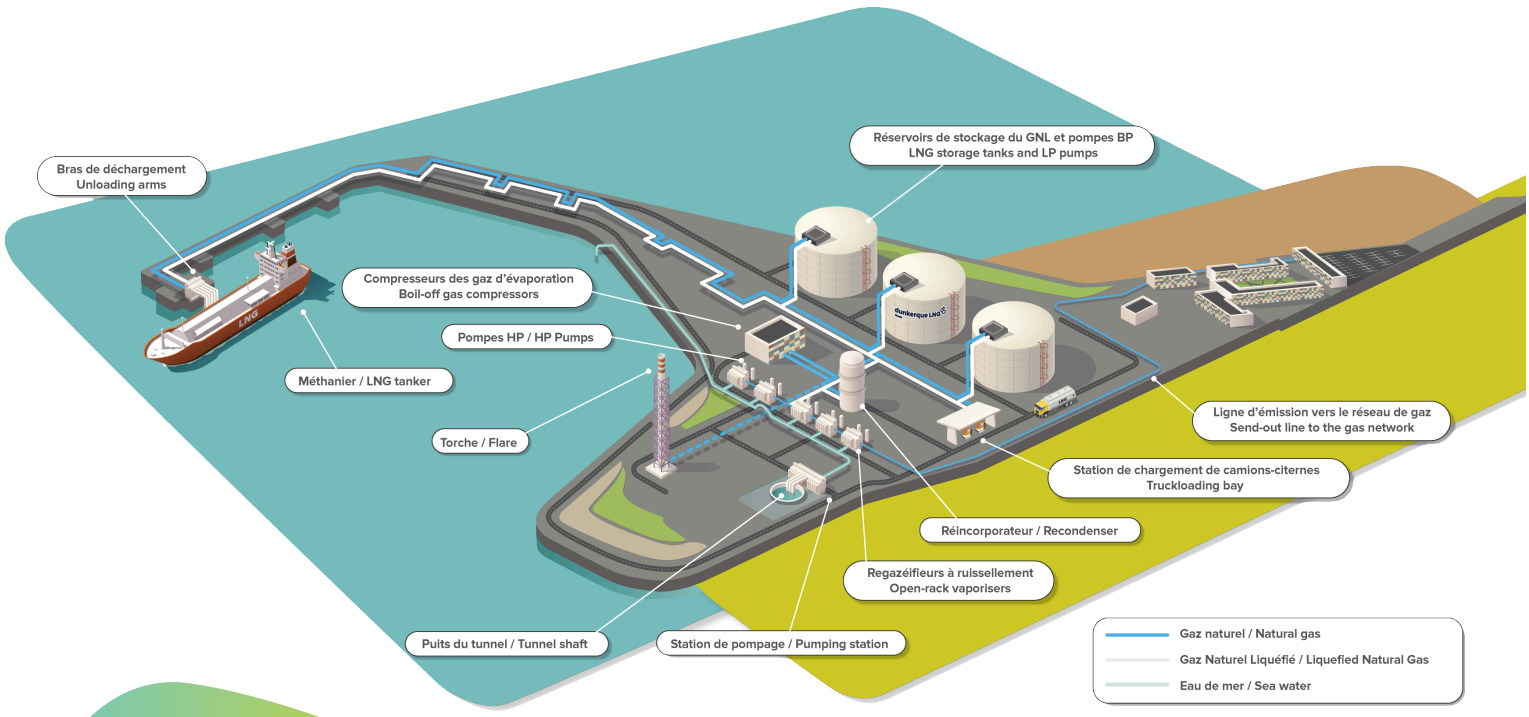
2. For an LNG terminal, unloading refers to the transfer of LNG into the terminal's tanks (unloading of an LNG carrier, for example), and reloading when LNG is transferred out of the terminal's tanks (for example, to reload an LNG carrier, tanker truck or bunkering vessel).

The Dunkirk LNG terminal installations

Equipment

The Dunkirk LNG terminal is fitted:

- with docking able to unload and reload LNG tankers at a maximum flow rate of 14,000 m^3/hr unloading and 8,800 m^3/hr reloading. This dock can accommodate up to 177 LNG tankers per year ranging from 5,000 m^3 to 265,000 m^3. The wharf platform sits on 184 piles between 30 to 50 metres in height. It is 300 metres long in total. The wharf has 5 unloading arms each measuring 33 metres high and weighing around 40 tonnes;
- with three LNG storage tanks at -162°C each holding 200,000 m^3. Each tank, at around 50 metres high and with a diameter of 90 metres, could hold an Arc de Triomphe. The inside of the tanks is at atmospheric pressure. They have no cooling system; the design and the thermal insulation of the tanks keeps the LNG at low temperatures;
- with 10 regasification units each consisting of a high-pressure pump taking the liquid gas to a pressure of around 90 bar, and a regasifier or Open Rack Vaporizer (ORV) which enables the LNG to be heated to a temperature of 2°C by heat exchange with warm water from the nuclear power plant, in order to transform it into natural gas before sending it to the carriers' high-pressure network;
- with a tunnel 5 km long and 3 metres in diameter between the Gravelines nuclear power station rejection tunnel and the terminal, used to carry some of the warm water output by the power station to heat the LNG in the ORVs. This takes the form of two figure-of-eight-shaped wells, one at the Gravelines power station 17 metres deep and 29 metres in diameter, and the other at the terminal site, 54 metres deep and 16 metres in diameter. The tunnel takes about 5% of the warm waste water produced by the Gravelines Nuclear power station at a flow-rate of between 0 and 12.5 m^3 per second. 12 traps have been installed in the power station output canal. A slope in the tunnel avoids the use of pumps to carry the water. Five sea water pumps have been installed at the terminal end and are directly controlled from the control room. This industrial synergy gives a saving of 436,000 tonnes of CO_2 per year, which equates to the CO_2 production for the annual gas consumption of the Dunkirk area.
- with a truck loading station with a capacity of 3,000 vehicles per year, operating at a maximum flow rate of 90 m3 per hour.



Capacity

The Dunkirk LNG terminal has an annual regasification capacity of 13 billion m^3 of gas, or around 20% of annual French and Belgian natural gas consumption, making it the second-largest on mainland Europe after Barcelona. It is also the only one to be directly connected to two markets, French and Belgian, thanks to two separate pipelines coming from the Pitgam compressor station.

Processes

Output flow-rate is controlled by operators in the control room, in accordance with the schedule requested by customers. To manage output from the terminal, there is a metering station on the GRTgaz network. Two pipelines have been constructed by French and Belgian network managers to allow direct delivery to these countries from the terminal. In France, a 17 km pipeline connects the terminal to the Pitgam compressor station. It is followed by a second pipeline 23 km long between Pitgam and Hondschoote, on the Belgian border. In Belgium, a 74 km pipeline has been laid between Alveringem and Maldegem, to link the Dunkirk terminal to the Zeebrugge area, and leading to the biggest markets in north-western Europe (Germany, Netherlands and the United Kingdom).

3. Economic impact on the region

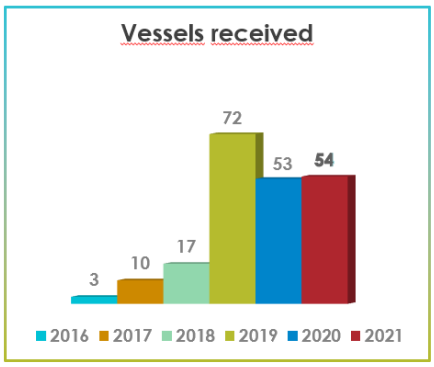
Employment

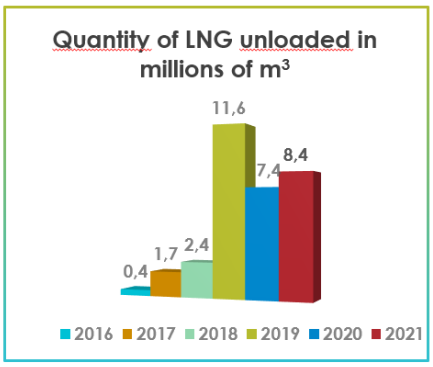
As at 1 January 2022, the Dunkerque LNG team had 32 staff and the Gaz Opale team had 66 staff. The terminal generates 73 induced jobs and a hundred indirect jobs in activities such as maintenance, port activities, tug-boats, pilotage and mooring in particular.

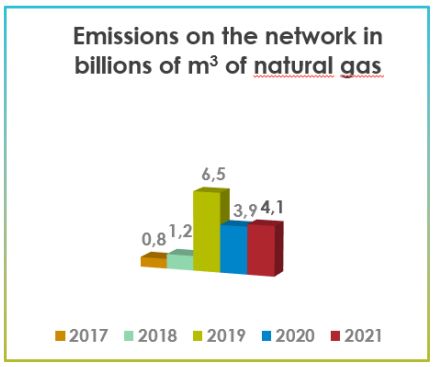
Taxes and local taxes

The total value of taxes paid by the Dunkirk LNG terminal was 18,5 million Euros in 2020, 18,3 million in 2019, 14 million Euros for 2018 and 16.7 million Euros in 2017. In 2021, this total rose to 11,5 million Euros. These taxes and rates are: land taxes, business rates, business added value contributions (CVAE) and a flat-rate tax on network businesses.

Activity of the terminal







In 2017, the Dunkirk LNG terminal received 10 ships to unload, totalling around 1.7 million m^3 of LNG, equating to 11.4 TWh. At the request of its customers, the terminal fed around 9.8 TWh into the gas transmission network.

In 2018, 15 ships were received for unloading, totalling around 2.4 million m^3 of LNG, equating to 16.3 TWh. The teams completed two reloads, giving a total of around 290,000 m^3 of LNG. At the request of customers, the terminal fed 1.2 billion m^3 of natural gas into the network, equating to around 14.3 TWh equating to 20% of the gas consumption of the Hauts-de-France region.

In its second year of operation, the LNG terminal saw a major increase in its activity: 70% more ships received in 2018 compared to the previous year and + 59% in tonnage, notwithstanding the planned shut-down in 2018.

In 2019, 71 ships unloaded LNG cargoes to the Dunkirk LNG terminal, totalling around 11.5 million m^3 of LNG, equating to 76 TWh. One vessel was reloaded with approximately 135,000 m^3 of LNG. For its customers, the terminal supplied the network with around 7 TWh, the equivalent of 17% of gas consumption in France or 105% of the consumption in the Hauts-de-France region.

In its third year of operation, the terminal beat its own records by achieving the monthly supply of 10 TWh to the gas transmission network in April and the daily supply of 443 GWh on 11 April. On 20 December, the terminal's teams welcomed their one hundredth vessel since the terminal was commissioned.

In 2020, 49 ships were received for unloading, totalling around 7.4 million m3 of LNG, the equating to 50 TWh. The teams carried out four reloadings for a total of approximately 548,000 m3 of LNG. At the request of customers, the terminal fed 3,9 billion m^3 of natural gas into the network, equating to around 46 TWh, the equivalent of 69% of the gas consumption of the Hauts-de-France region.

In 2021, 54 ships unloaded their LNG cargoes to the Dunkirk LNG terminal for approximately 8.4 million m3 of LNG, the equivalent of 56 TWh. 8 ships were received for reloading for approximately 707,707 m3 of LNG. For its customers, the terminal fed more than 4.1 billion m3 of natural gas into the network, equating to around 52 TWh, the equivalent of 78% of the gas consumption of Hauts-de-France in 2020.

GENERAL

2nd
largest LNG terminal in continental Europe

600 000 m³
LNG storage capacity at 162 °C

176
Capacity of ship / year

3 000
Loading capacity of tanker / year

PERFORMANCE

	In 2021		In total*
Vessels received	62		216
Gas supplied on network	52 TWh		198 TWh
Unloaded gas	56 TWh		211 TWh
Reloaded gas	4,7 TWh		11,7 TWh

HUMAN

88
Employees

100
Indirect employments

1 730
Training hours in 2021

47,9 %
First aid worker (SST)

10
Partnerships on the territory in favour of young people in the fields of sport and culture

*From commissioning on July 8, 2016 until Decembre

4. Strategy and major projects

Future strategy

The new shareholders in the Dunkirk LNG terminal fully support it in its intentions to increase its activity, with the aim of profiting from the growth of LNG in Europe and the development of a small-scale market (by setting up an innovative supply chain via LNG reloading service using road tankers and bunker barges). Dunkerque LNG will benefit from the full range of the Fluxys group's LNG expertise – one of its core businesses – and its long-standing commercial relationships in the LNG world.

The Dunkirk terminal is a major asset for the supply of gas to France and North-West Europe. Gas production in the Netherlands and the North Sea is falling, while European demand is seeing a slight rise: the capacity of the terminal is expected to play a key role. Germany, for example, is looking to diversify its gas supply using LNG.

The Dunkirk terminal could therefore become a real bridge thanks to its excellent interconnection with not only French and Belgian but also German gas networks, and would provide a solution to the expected growth in new gas import requirements for Germany, compensating for:

- the progressive reduction in gas exports from Groningen and domestic production (order of magnitude 250 TWh/year);
- the announced closure in Germany of coal-fired electrical power stations (representing an additional natural gas requirement of up to 300 TWh/year).

Facilities undergoing changes

Truck Loading

An LNG road-tanker filling station has been completed. It is expected to open commercially before summer 2020. This station can take up to 3,000 vehicles a year, which equates to 60,000 tonnes of LNG, or 133,000 m^3.

Since then, more than 760 trucks have benefited from this service in 2021.

Unique services in Europe are associated with it : online reservation and driver training accessible 24/7 and loading independently or assisted.

In June 2017, Dunkerque LNG and the Dunkirk Major Sea Port signed a partnership agreement for the development of this LNG road-tanker filling station. Under the terms of this agreement, the Dunkirk Major Sea Port will partner with Dunkerque LNG in its commitment to construct and then operate the filling station. It forms part of a more general project to implement an LNG refuelling service by land and sea in the port of Dunkirk, bringing an LNG refuelling offering to the market.

The terminal also has room to build two new reloading bays depending on customer requirements.

3,000 slots per year

Loading flow **50 m³/h**

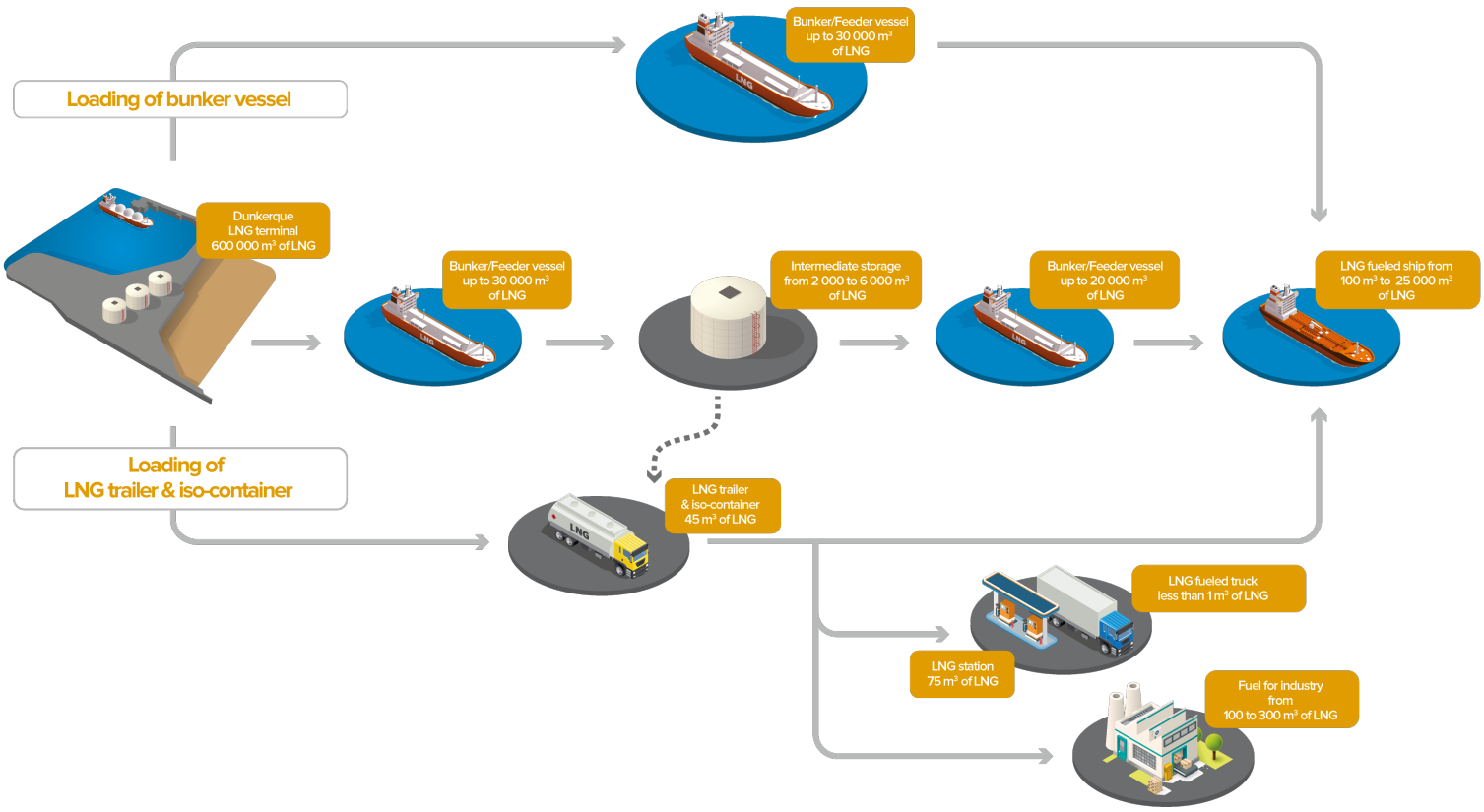
LNG road-tanker filling station *at the Dunkirk LNG terminal*

Small-scale LNG activities

Since June 2020, the replacement of the central docking shields on the jetty of the Dunkirk LNG terminal allow the reception of bunker or refueling vessels from 5,000 m3. These vessels are tasked with supplying LNG-powered commercial vessels, such as container ships or ferries.

The terminal teams are considering, depending on the development of the market, the creation of a jetty dedicated to refueling.

Small Scale LNG from Dunkirk: a closer look



Gas Agility : first LNG bunkering vessel loaded

In April 2021, after loading at the Dunkirk LNG terminal, the Gas Agility bunkered CMA CGM's flagship container ship, the Jacques Saadé, with LNG at the Flandres terminal.

This is the first refueling of marine LNG for a container ship in France.

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Report on construction

Press kit | 2022

Dunkirk LNG terminal

Since starting commercial operations on the 1st of January 2017, Dunkirk's LNG terminal has been generating profitable economic activity for the region. With around 70 direct jobs, around a hundred indirect jobs, and already more than 49 million paid in taxes and local taxes, the terminal is contributing to the success of the region.

We take a closer look at its construction – a ground-breaking project of key importance to the region, and a remarkable achievement in terms of environmental integration.

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1. The project

On 27 June 2011, EDF along with its partners Fluxys and Total gave approval for the construction of Dunkirk's LNG terminal. All permits and authorisations having being obtained, port works carried out and contractors chosen, construction started in 2012. Commercial commissioning by the shareholders took place the 1st of January 2017.

The construction represented an investment of 1.2 billion Euros for the terminal alone, plus a further 150 million euros for the port works and 80 million Euros to connect the terminal to the Pitgam compressor station.

Operating licences under Facilities Classified for Environmental Protection (ICPE), and for Public Utility Services were obtained by Dunkerque LNG on 9 April 2010, along with the Water Legislation Decree-Law by the Dunkirk Major Sea Port. The latter also obtained an Order on Dispensation from article L411-2 of the French Environment Code on 31 July 2009. The Construction permit was granted to Dunkerque LNG in July 2009.

For this major project, three contract managers came together:

- the Dunkirk Major Sea Port completed the port infrastructure, comprising a harbour basin and a platform to accommodate the industrial installations (partly reclaimed from the Western outer port), with a surface area around 56 hectares, the equivalent of 80 football pitches;
- Dunkerque LNG, for the industrial unloading and reloading[1], LNG storage and regasification facilities, pipework and arrangements required to operate the terminal;
- GRTgaz, who laid the pipework required to transport the gas from the terminal and connected it to the distribution network. In mid-May 2012, GRTgaz and Fluxys Belgium agreed on the installation of a connection to the gas network in Belgium and went on to obtain the administrative authorisations. The LNG terminal is thus connected to two gas distribution networks, confirming its status as a European LNG terminal.

Throughout its construction, the Dunkirk LNG terminal was the second largest industrial project in France, both in terms of investment and the number of hours worked.

1. For an LNG terminal, unloading refers to the transfer of LNG to the terminal's tanks (unloading of an LNG carrier, for example), and reloading when LNG is transferred from the terminal's tanks (for example, to reload an LNG carrier, tanker truck or bunkering vessel)

A defining project for the Dunkirk region

The main contractors for Dunkerque LNG were:

- Techint Sener for the terminal construction process;
- Entrepose Projets / Bouygues for creating the three tanks;
- CSM-Bessac Razel-Bec Soletanche-Bachy France constructed the tunnel bringing warm water from the Gravelines nuclear power station to the terminal.

In addition to the construction of the LNG terminal making an estimated contribution of more than 7% to an increase in port traffic tonnage, further economic benefits were also expected for the Dunkirk region:

- the creation of jobs, with a forecast under normal operation, after the project phase, of 60 jobs directly relating to the operation of the terminal plus around a hundred indirect jobs (port activities, including tug work, pilotage and mooring);
- the development of new economic activities connected with the "cooling" sector (use of cooling units), including a research centre as part of a cluster philosophy and the development of maintenance activities;
- Substantial and regular revenue for regional governments: the Hauts-de-France region, the Nord Department, the Dunkirk urban community and the Loon-Plage commune.

The LNG terminal project has brought 640 million Euros of direct, indirect and induced benefits to the Dunkirk region. In total, the project has resulted in the creation of 1,100 jobs in the hotel and catering trade, and 4,500 induced jobs in businesses. Out of 1,600 businesses which worked for the project, 1,300 businesses were French, 340 of which were from the Dunkirk area, whilst the others came from 17 different nationalities. All in all, the indirect and induced effects helped generate 240 million Euros turnover for the local economy, or the equivalent of 5,600 salaried positions.

A remarkable environmental integration

The terminal is located in the Loon Plage commune at the Clipon site, an artificial dune created around thirty years ago when the Western Dunkirk outer port was created.

The project developers made all the necessary consultations at the local level. The concerns expressed during the public debate held in 2007, and the decision to make this large industrial project an example of how environmental requirements can be integrated, led to a number of key technical decisions. These related in particular to the location of the terminal. The site was moved to the west to completely protect areas of sensitive biodiversity. In addition, compensatory measures were implemented for the construction of the terminal.

In addition, a non-CO_2-producing regasification solution was selected, while using some of the warm waste water from the Gravelines nuclear power plant. This amounts to a saving of nearly 436,000 tonnes of CO_2 a year.

A construction site on a national and European level

Dunkirk's LNG terminal was created against a backdrop of growing dependence in Europe, and in France in particular, on natural gas imports from outside the European Union, as conventional gas production in the North Sea draws to a close. The installation of this LNG terminal is therefore a strategic one, and should create a flexible raw energy supply source, close to an area of high consumption, against a backdrop of tensions on the energy market.

Specifically, the Dunkirk terminal:

- is unique in that it is connected to 2 markets: French and Belgian;
- brings significantly increased competition to the gas supply market;
- offers customers real flexibility.

2. The support programme

Following the public debate of 2007, a programme of support and compensatory measures accompanying the LNG terminal project was publicly unveiled. On this basis, Dunkerque LNG undertook a consultation process with the parties concerned so that all of the programme's measures were ready to be launched when the investment decision was made on 27 June 2011. Dunkerque LNG took particular care that all these measures coherently addressed the impact of the project – not only regarding the environment but also its utility and its integration into the environment, ensuring that the infrastructure would bring benefits to the whole of the region. The financial budget allocated by Dunkerque LNG for this programme was significant: more than 11.5 million Euros.

Compensatory environmental measures

Two environmental compensation measures, designed to compensate for the impact of the project on fauna and flora, were organised by Dunkerque LNG:

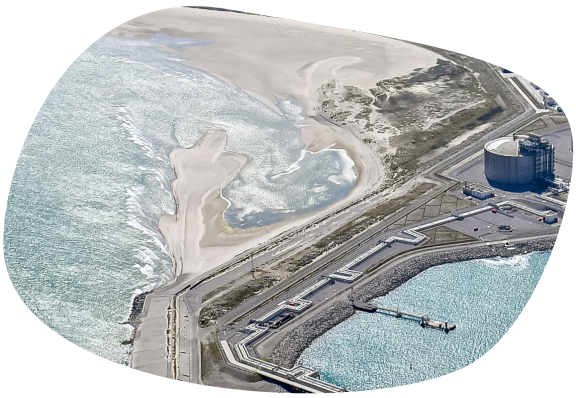
- the construction of a habitat for migratory birds on the Gravelines commune, covering an area of 20 hectares, named the "Hems Saint-Pol sensitive natural site";
- the creation of a biodiversity preservation zone located within the confines of the Gravelines nuclear power station, covering an area of 4.5 hectares.

The Nord region departmental council is now responsible for managing these two zones.

Other measures, for which the Nord region departmental council is also responsible, have been undertaken by the Dunkirk Major Sea Port. They involve:

- the reconstruction of wild bird habitats and the dune ecosystem on the edges of the site;
- the establishment of a preservation area at Clipon Est, including the creation of salt marshes used by birds as a feeding area;
- the creation of a preservation area, which complements Dunkerque LNG's second measure and provides access arrangements for anglers.

A prefectoral decree dated 31 July 2009 governs all of the compensatory environmental measures.



Clipon dune

Hems Saint-Pol sensitive natural site

Economic support measures

Dunkerque LNG is adopting a local approach in this respect, involving other industries affected by the issue.

- Effects of the project on the region, in conjunction with the Dunkirk Chamber of Commerce and Industry: the Dunkirk CCI organised information meetings and an extranet site to provide them with the necessary information to enable them to give the best possible responses to any Requests For Tenders. An information and business support officer worked for three years on this project;
- Accommodation: a consultation process run by the Dunkirk Urban Community (CUD) and the Dunkirk CCI to identify requirements relating to the construction site resulted in the creation of an Internet site for businesses seeking accommodation solutions for their personnel;
- Research and development: an agreement signed with the Université du Littoral Côte d'Opale enabled the financing of two thesis subjects relating to refrigeration;
- INNOCOLD: also in the research and development field, the CUD ran a feasibility study relating to the creation of an R&D activity relating to refrigeration in the Dunkirk area. The private component of its public-private financing is supported by Dunkerque LNG and several regional businesses (including Europipe, Arcelor, Dalkia Nord, Ponticelli). It gave rise to the creation of the INNOCOLD association in 2011;
- Employment and training: work conducted by the government's Pôle Emploi employment agency, the Regional Council and the "Entreprendre Ensemble" association has identified the necessary training programmes for implementing this initiative, with an emphasis on sourcing local workers. A discussion on the anticipation of these training schemes was launched, taking into account the learning periods required for some jobs. To address the labour needs of companies working on the terminal project, Pôle Emploi and Entreprendre Ensemble set up an employment point at the terminal site;
- The anchorage agreement: Dunkerque LNG anticipated the completion of the construction project by signing an anchorage agreement with the Government on 19 February 2014. This agreement also demonstrates the commitment to jobs shown by Dunkerque LNG from the very start of construction in December 2011.

Society and community support measures

Leisure activity compensation: although access is prohibited, the Le Clipon site was frequented by anglers, hunters, kitesurfers and windsurfers, ramblers and birdwatchers. Measures have been put in place to take the location's community aspects into account:

- the installation of safety equipment for the kitesurfing association of Dunkirk;
- participation in the creation of a leisure lake nearby the terminal at the PAarc (the Parc Paysager des Rives de l'Aa in Gravelines);
- permission for bird watchers to access the terminal under certain conditions;
- the creation of a nature centre and a natural bathing area, "Aqualamé", built in close cooperation with Loon-Plage town hall, on a site set aside for public use: the Parc Galamé.

3. Dunkerque LNG: committed to employment

With more than 7,200 people having worked on the construction site, more than 12 million hours work were required to build Dunkirk's LNG terminal. 1,326 people were recruited for this purpose through Pôle Emploi. Since the start of the project in December 2011, Dunkerque LNG has been actively involved in promoting employment. Since the end of 2013, the company has also been planning for the end of the construction project. This initiative saw the signature of an anchorage agreement with the Government on 19 February 2014. This agreement covers three systems.

The "50 contracts for young people" scheme

Under this scheme, 50 young people under 26 were brought to work on the site as apprentices to be trained by a business working on the site (9-month contracts) then, once trained and qualified, recruited by a local business. 51 placements were identified (HSE technicians, quality technicians, mechanics, welders, work progress engineers, documentation officers, handling, welders, pipefitters, scaffolding erectors, boilermakers, accounts assistants, administrative assistants, ordering technicians) in businesses on the construction site or working for the construction project: CMP, Entrepose Projets, ETMI, Eurovia, IREM, Prezioso, Razel-Bec, Rouvroy, Schoonberg, TS LNG and Techint. The contract was managed by the Metallurgy, Industry and Construction GEIQ (inclusive employers' association). For some posts, training under the contract was provided by the Dunkirk CCI's CETR on-site training initiative.

Dunkerque LNG financed the entire arrangement (around 1.5 million Euros) with the aim of raising skill levels in the region. Dunkerque LNG teamed up with several partners to carry out this plan: Entreprendre Ensemble, Pôle emploi, the Metallurgy, Industry and Construction GEIQ, the Regional council, DIRECCTE, the Rives de l'Aa and Colme Local Mission, the Loon-Plage branch of Dunkirk's Maison de l'emploi, UIMM Flandre Maritime and MEDEF. All have been working to follow up on these training contracts by seeking companies for future employment: companies involved in the work site, companies working at the Gravelines CNPE (prospects for post-Fukushima and major overhaul worksites) and local companies.

A procedure to plan for the end of contracts (GTEC)

The partners Pôle emploi, Entreprendre Ensemble, the Region, Dunkirk CCI, local SMEs, construction site businesses, employers federations in Civil Engineering and metallurgy and EDF worked in partnership with the construction site contract managers (Dunkerque LNG, Dunkirk Major Sea Port and GRT Gaz) in a Local Employment and Skills Management plan (GTEC). Starting in early 2013, it helped anyone who had worked on the LNG terminal construction site to capitalise on their professional experience and skills acquired on the construction site with other local businesses.

The GTEC approach has three components:

- the creation of a worksite skills map by conducting a survey of the contracting and sub-contracting companies;
- identification of local skill needs and prospective analysis of the evolution of the labour pool, in particular by studying employment opportunities related to future major projects to be conducted locally (Calais 2015, major overhaul of CNPE, port development projects, etc.). This data is combined with the identified worksite skills;
- awarding of an "LNG terminal construction site abilities and skills passport" summarising the know-how, soft skills and experience gained with one of the contractors or sub-contractors after three months' experience. By June 2016, 349 people had received one of these passports.

This forward-looking strategy by Dunkerque LNG is enshrined in a charter. It provides a reminder of the efforts and commitments made in partnership with companies working on the project and local companies. The strategy has helped to build up a network capable of identifying trades where there were shortages and to ensure construction site skills were aimed at these trades.

The "SME/SMI support" mechanism

This mechanism provided a means of working with the region, in particular Dunkirk CCI, to analyse what lessons could be learned from the construction project in terms of sub-contracting. It is in several parts:

- determine the key factors for success for French businesses working on the construction project;
- determine what difficulties SMEs and SMIs faced in responding to requests for tenders from the project;
- offer support to SMEs/SMIs wishing to develop into the oil & gas sector and the refrigeration sector (with INNOCOLD);
- conduct a study on the overall implications of the LNG terminal project.

The conclusions drawn from this analysis, carried out in conjunction with all partners, have been of benefit to the region's involvement in the large projects that have followed the construction of Dunkirk's LNG terminal, such as the Calais Port construction project.

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