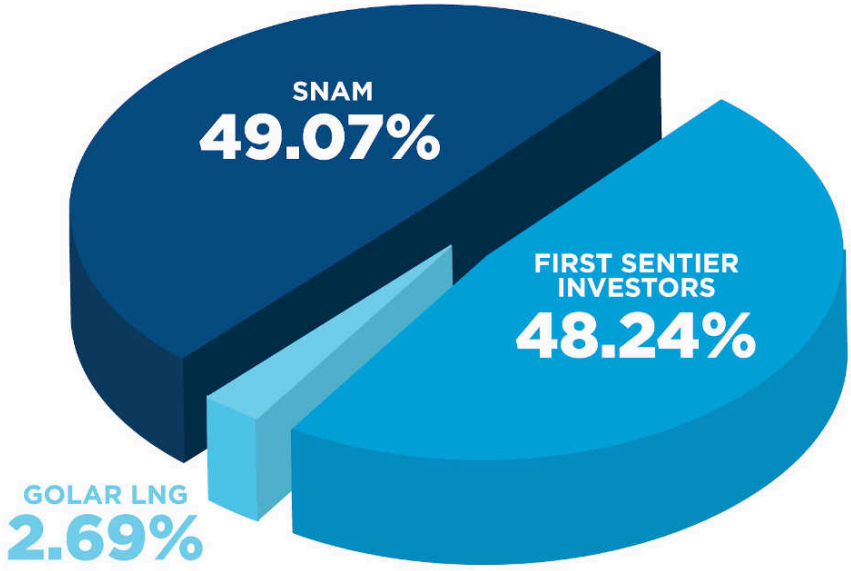
In Europe, another step forward for the development of the SSLNG market was achieved in the last quarter of 2020. OLT Offshore LNG Toscana – the company controlled by Snam and First Sentier Investors that manages the Terminal “FSRU Toscana” off the Tuscan coast between Livorno and Pisa – received the greenlight from the Italian Ministry of Economic Development, in agreement with the Ministry of Infrastructures and Transport and the Tuscany Region, to provide the discharge of liquefied natural gas (LNG) on Small Scale LNG carriers. This is an important milestone for Italy, since “FSRU Toscana” could probably become, soon, the first Italian terminal able to provide this service, currently not available in Italy.

LNG as a fuel plays a fundamental role for the energy transition that will lead to the abandonment of fossil fuels in 2050 and it can play a key role in global efforts to reduce the environmental footprint of the transport sector in place of traditional fuels, in particular in the maritime transport sector and heavy road transport. To date, 34% of energy consumption is dependent on petroleum products, 34.5% on natural gas and 20.5% on renewable sources.

According to the NECP (National Integrated Energy and Climate Plan), the targets for 2030 is a coverage of energy consumption from renewable sources at 30%, providing for a dependence on natural gas of 36% and on petroleum products of 31%.

LNG is a solution that makes it possible to increase the security and diversification of energy supply and to significantly reduce emissions from maritime transport, almost eliminating emissions of sulphur oxides. The use of LNG is therefore an integral part of a broader European Union energy-environmental policy plan.



OLT Offshore LNG Toscana Shareholders.

The LNG needed for the Italian SSLNG logistic chain is totally supplied from abroad. The availability of this new service will add a fundamental element to the further development of the SSLNG market, allowing the completion of the supply chain of LNG as a fuel, not only for land transport but also for sea transport, as well as for industrial and civil uses in areas not served by the national gas grid. Italy with almost 8,000 km of coastline, located exactly in the center of the Mediterranean, has the challenge to play a fundamental role for the development of this emerging market.

OLT's SSLNG project will enable the country to be competitive in one of the markets with the highest growth rate despite Covid 19 crisis.

In Europe countries such as Spain, France, Belgium, the Netherlands and Scandinavia have been providing SSLNG services from their LNG terminals for many years, enabling the ship industry to build hybrid or exclusively LNG fueled ships to

be bunkered by LNG in the main ports, thus complying with the stringent International Maritime Organization (IMO) limits on nitrogen and sulfur emissions that have already come into force since 1st January 2020. The sulphur emissions limit has been reduced worldwide. Now the allowed sulphur content in marine fuels is 0.5% max from the previous 3.5%. LNG is compliant with this limit at affordable way. Furthermore, the current discussion about the inclusion of the Mediterranean Sea in the Sulphur Emission Controlled Area “SECA” – where the limit is at 0.1%. – could additionally enforce this process in converting the obsolete fleets into new environmentally sustainable ones. The North Sea, the Channel and the Baltic Sea are already “SECA”.

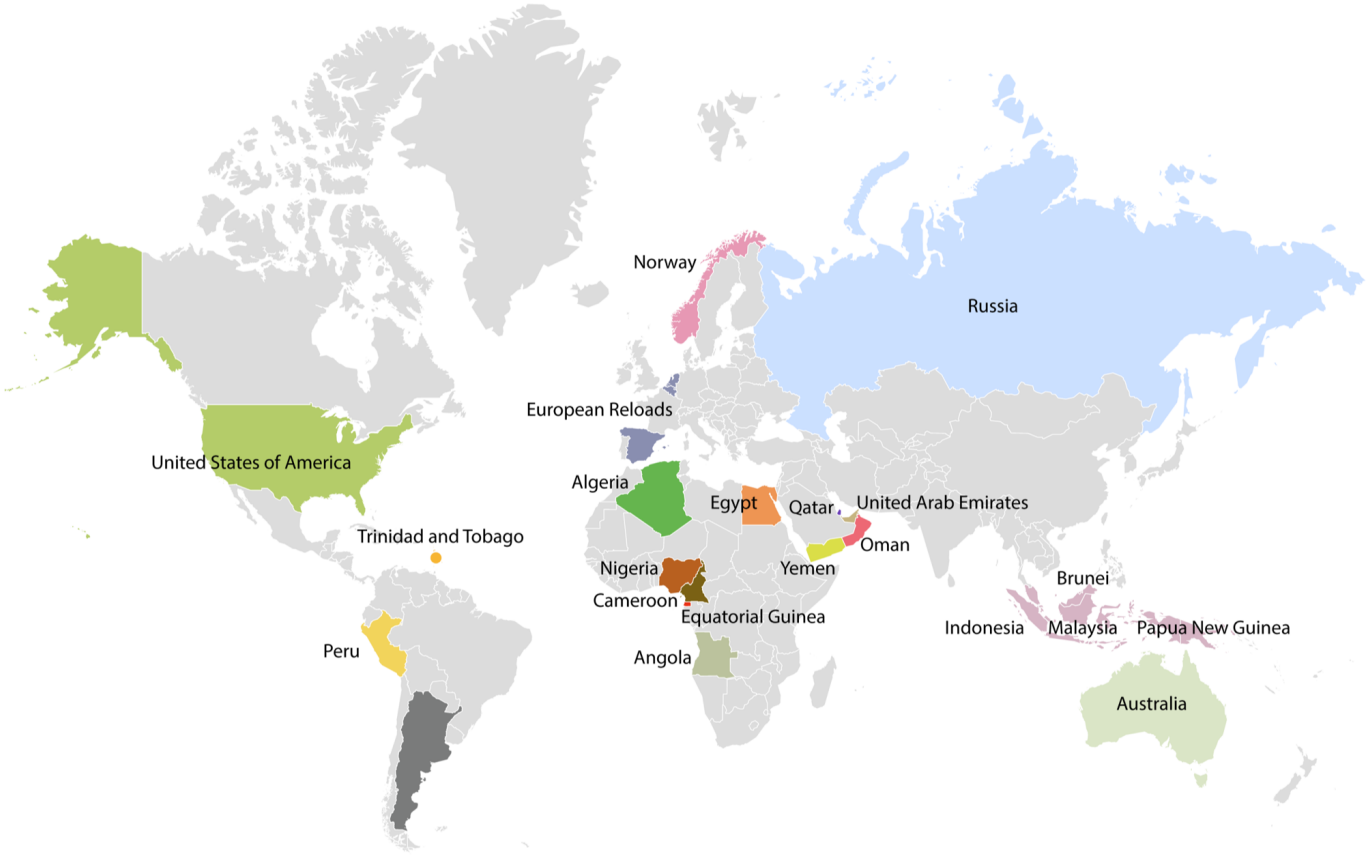


Some pictures of the Terminal FSRU Toscana.

LNG propulsion is spreading particularly in the Ro/Ro sector, supporting port activities, and in the cruise sector that, with 12 new orders and 2 cruise ships already operating in the North Sea and the Mediterranean, leads the revolution of the entire sector in terms of volumes of LNG needed. Livorno, one of the busiest Italian port for number of cruise ships mooring during each year, would benefit from the reduced emission of these type of ships, especially in terms of air quality, because the harbour is exactly in the heart of the city, close to the old town. This scenario also includes the spread of small LNG carriers, which can bunker directly

other ships, that in two years increased by more than 400%, going from 6 ships in 2019 to 21, operational, by the end of 2021. LNG is also playing a central role in heavy road transport; in fact, it is the only alternative fuel that can guarantee the same performance as traditional fuels, with a lower environmental impact, lower noises and allowing compliance with the short-term objectives of the European Green Deal. In Italy, the number of LNG distributors has gone from 6 in 2016 to 83 at the end of 2020, confirming the country as one of the first European leaders, in terms of number of LNG gas stations.

Since the beginning of the operations, in 2013, OLT Offshore LNG Toscana has worked to maximize the use of the Terminal. In the last two years, the capacity allocated reached almost the 100%, as a sign from the users that the Terminal with its flexibility can take profit from the favorable condition of the LNG market; in addition, in these last two years, long term regasification capacity contracts were signed up to the gas year 2022/2023. The Terminal can receive almost the 90% of the LNG carrier fleet currently in operation starting from 65,000 liqcm up to the New Panamax Class; thanks to the Wobbe Index Corrector installed on board, the terminal can receive LNG from almost all continents. The contribution of “FSRU Toscana” to the diversification of supplies is confirmed by the receipt of LNG cargoes from: Algeria, Cameroon, Egypt, Equatorial Guinea, Nigeria, Norway, Peru, Qatar, Trinidad and Tobago and the United States (following image).



OLT LNG CARGO ORIGINS*	
1. USA	44%
2. Algeria	12%
3. Qatar	10%
4. Egypt	7%
5. Norway	7%
6. Nigeria	6%
7. Trinidad & Tobago	5%
8. Equatorial Guinea	4%
9. European Reload	3%
10. Peru	1%
11. Cameroon	1%

*Since the start of operation YTD IQ 2021

LNG cargoes origin.

The current high availability of LNG at the Terminal means potential LNG availability for other scopes. In fact, following the high interest expressed by many users of the Terminal to receive the LNG for the SSLNG market, OLT started to verify the

feasibility of this new service already in 2015. Following the good results obtained by the pre-feasibility study, that verified the technical feasibility, in 2020, OLT completed the detailed engineering studies, ready for procurement and construction. Finally, in the last quarter of 2020, The Ministry of Economic Development, in agreement with the Ministry of Infrastructures and Transport and the Tuscany Region, issued the decree authorizing OLT Offshore LNG Toscana to modify the Terminal to provide the discharge of LNG into Small Scale LNG carriers.

As result of the detailed design, that was developed in parallel with the authorization process, the purchase orders for the components and the necessary works were started and the launch of the SSLNG service is expected starting from January 2022. According to the schedule in twelve months OLT will be able to load small LNG carriers up to 120 meters in length correspondent, on average, to a SSLNGc of around 7,500 liqcm (following image).

Parameter	Range (Min – Max) or Value
General Particulars	
LNGc Capacity (typical)	7500 m^3
Maximum Operating pressure	3,5 barg
Length overall	90 m -120 m
Breadth	15.0 m - 20.0 m
Loaded Draught	5.5 m - 8.0 m
LNG tank Type	Pressurized horizontal cylindrical, Membrane
LNG Manifolds	
Manifold dimensions and positions, heights and allowable loads	According to Category B1 and B2 of SIGTTO (Height of manifolds above swl min 6 m max 18 m)
Mooring	
Minimum freeboard to mooring deck at Fully Loaded Draught	4,5 m
Number of winches	Sufficient number in order to comply with minimum number of mooring lines requested by terminal
Number of Mooring Lines	8 (2 head lines, 2 fwd spring, 2aft spring, 2 stern lines)
Ship design minimum breaking load	No less than 45 t
Mooring Tails	Only Nylon

SSLNGc main features.

The side-by-side mooring analysis of a 7,500 liqcm, considered in terms of mooring verification, the berthing lines tensions and fender deflections, the relative motions at LNG cryogenic hoses flanged connections in connected configuration and checked the clash between the FSRU and SSLNGc structures and set the unmooring limit. Two berthing layouts have been assessed in this mooring analysis: the two systems differ only in the number and layout of the berthing lines, keeping the other parameters, such as fenders number and type, spotting line location, etc. unchanged. The two berthing layouts assessed are one with 8 lines equipped with 11m nylon tails and the other one with 10 lines equipped with 11m nylon tails.

Also, a full-mission bridge simulation for SSLNGc, FSRU has already been assessed.

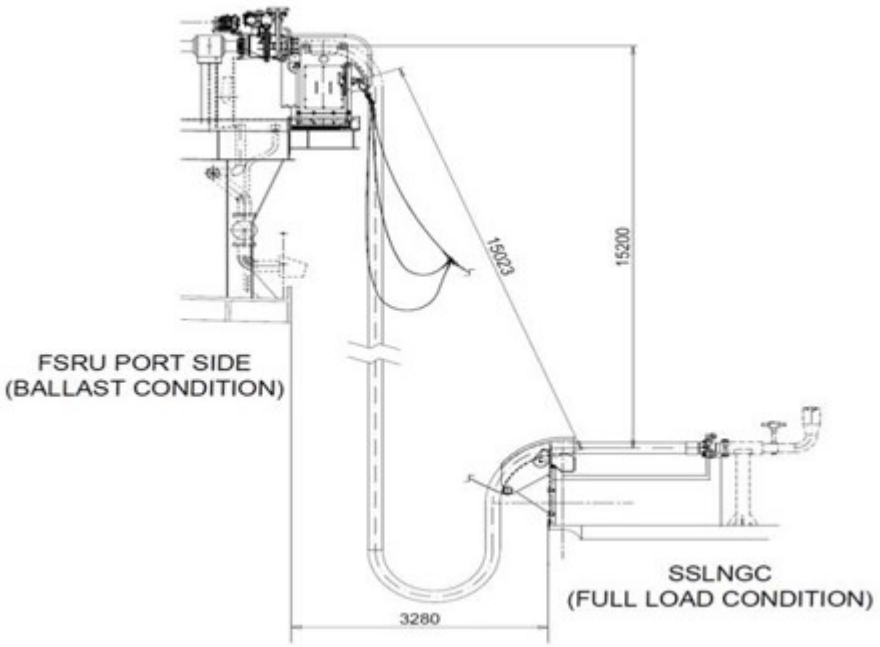
The maneuvering studies have been carried on with a model of a SSLNGc of about 120 m length to identify the metocean conditions for the mooring limits and to point out the criticalities of the mooring and unmooring maneuver (following image).



Mooring/unmooring maneuvering study.

The Terminal modifications that will be carried on during these months are related to the port side of the Terminal which is the opposite side of the one currently used to unload the LNG carriers for regasification purposes. The port side of the Terminal will need the installation of new mooring equipment, such as new fairleads and quick release hooks, to berth alongside SSLNGc between 90 m and 120 m. The existing port manifolds lines will also be modified to connect 6-inch cryogenic hoses with an emergency release system in a configuration L-V-L including an upgrade of

ship shore link (following image). All the above modifications will be done in accordance with class and SIGTTO and OCIMF recommendations.



Terminal portside LNG transfer system after modification.

Head Image: Terminal FSRU Toscana.