

LNG: Regions on the Rise

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By: [Ronen “Ro” Lazarovitch](#) [Adam Quigley](#)

Europe (both Continental Europe and the UK) is generally characterised as a single large LNG import market, and one in which European importing countries collectively compete with the world's top importing region of Asia. Whilst Europe's importing nations do share many common characteristics (e.g. most European regasification capacity is onshore) and trends, there are nonetheless a number of regional differences within the wider European LNG regasification market. Not only does LNG play different roles and have differing strategic importance across Europe's importing countries, but market and regulatory dynamics vary across sub-regions and countries. Furthermore, the sources of gas supply (LNG vs pipeline and domestic vs import) and connectivity to other gas markets varies across the wider region and between individual countries. Overall, the European LNG market is diverse and has adapted to be fit-for-purpose in distinct sub-regions and individual countries.

The sub-regions and hubs within the European LNG market are broadly North-West Europe (including the UK), Southern Europe, and the (European) East Mediterranean, with smaller distinct markets in North-Eastern Europe and the Baltic region. Separately there is a concept of a Euro-Mediterranean region which, in addition to the EU Member States and the UK, encompasses Turkey, Israel, and the North African LNG-producing Mediterranean nations.

This article considers some of the distinct characteristics of Europe's LNG sub-regions, the role of LNG in the Mediterranean, and potential synergies across the Euro-Mediterranean region.

From North to South and In-between

North-West Europe

The North-West Europe LNG sub-region (or 'hub') loosely covers the importing countries of the UK, Belgium, the Netherlands, and northern France. Germany is poised to become the next member of the North-West Europe LNG club due to the country's phasing out of coal and lignite-fueled power production. The UK and France (after Spain) have the second and third largest regasification capacity in Europe, respectively.

North-West Europe boasts significant gas storage capacity and a highly developed and integrated pipeline network that allows regasified LNG that is imported into any of the North-West European LNG terminals to be supplied into a number of Northern and Central European countries, including landlocked Austria and Switzerland. North-West Europe has suffered the most from the rapid decline in natural gas production from the Netherlands (including the phase-out of production from Groningen, Western Europe's largest gas field, which is scheduled

to cease operations in mid-2022) and the UK North Sea. Whilst the roll out of renewable energy in North-West Europe, particularly offshore wind, is meeting some of the region's electricity demand, gas remains a key fuel for the region and the decline of domestic production increases the region's reliance on LNG and natural gas imports.

LNG demand in North-West Europe (in particular) is highly seasonal due to cold winters in the sub-region and prices typically spike over the winter months. The baskets of LNG spot prices for LNG sales into North-West Europe will typically have a Dutch (virtual) Title Transfer Facility (TTF) linked component. Whilst LNG sales into the UK's three large scale LNG terminals are still often linked to the UK's (virtual) National Balancing Point (NBP) prices, the TTF index is starting to prevail as the key price index for North-West Europe. North-West Europe's extensive storage capacity allows LNG producers to unload and store cargoes in the region during periods when demand is weak (and prices are therefore lower) in the premium Asian market. However, North-West Europe entered into winter 2021/2022 with storage levels at approximately 70% of capacity (as of the beginning of December 2021) following an unusually cold autumn – levels which some say are worryingly low – as a result of the high price of buying LNG or gas to fill them.

The US was the biggest LNG supplier to the Netherlands in 2Q21 (56%), while Russian LNG accounted for most of Belgium's imports (48%). France received approximately the same amount of LNG from the US and Russia in the same period (29% each), whilst Qatar accounted for 60% of the UK's LNG imports.

Baltic Sea Region

Further north, the Baltic Sea is an arm of the Atlantic Ocean, enclosed by Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russia, and Sweden. Poland's Świnoujście onshore LNG terminal and Lithuania's Klaipėda FSRU both sit in North-East Europe and supply regasified LNG into Eastern Europe, diversifying gas supply to an area that has historically relied on Russian pipeline gas for 100% of its gas supply. Sweden and Finland currently only have small scale LNG markets. Kaliningrad, the Russian exclave on the Baltic Sea, also has an FSRU for receipt of Russian LNG. A number of large scale and small scale stand-alone or integrated LNG import projects are either proposed or under development in the eastern Baltic countries of Estonia and Latvia. European Russia, along with Norway, are Europe's only two LNG exporting countries. Whilst Norway is a large exporter of gas generally, only 5% of its exports are in the form of LNG. Norway's LNG exports are from the Hammerfest LNG terminal, which liquefies gas produced from the Snøhvit field in the Barents Sea, within the Arctic Circle. The Hammerfest LNG terminal has been closed for repairs following a fire in September 2020 and is due to restart operations in 1Q22. In 2Q21, US LNG met the majority of Lithuania's (48%) and Poland's (41%) LNG demand.

Southern Europe

Spain and Portugal and, in some contexts, Italy, make up the Southern Europe LNG sub-region. The Spanish and Portuguese gas networks are inter-connected but are not connected to the rest of Europe, largely due to the impracticalities of building gas pipeline infrastructure across the Pyrenees Mountains which sit between France and Spain. Instead, Spain and Portugal rely heavily on LNG and natural gas imports from Algeria. Regasified LNG is Portugal's largest source of gas supply. The country purchases most of its LNG under long-term contracts, but it also

depends on the LNG spot market to meet spikes in gas demand especially during winter, which has made Portugal extremely exposed to recent high global LNG spot prices. The separation of the Spanish, Portuguese, and Italian LNG markets from the rest of continental Europe creates flexibility in LNG pricing models. The Punto di Scambio Virtuale (Virtual Trading Point) (PSV) is the main price indicator for LNG sales to Italy, and the Punto Virtual de Balance (PVB) has become the key indicator for LNG sales to Spain and Portugal, both of which have stayed higher than TTF prices throughout 2021. This enabled these Southern European countries to compete with typically higher Asian LNG spot prices over 2Q21 and 3Q21 when North-West European cargos were being redirected to Asia.

The US was the biggest supplier of LNG to Spain (22%) in 2Q21, with Nigeria meeting most of Portugal's LNG demand (42%). Qatar was the biggest supplier to Italy in that period (54%).

The other LNG importing countries in Southern Europe are Croatia, Greece, Turkey (which straddles Europe and Asia), and the island of Malta which imports LNG for power generation only and still does not have its own gas pipeline network. Croatia's Krk island FSRU is strategically located to supply gas into landlocked Eastern Europe which relies heavily on Russian pipeline gas. Cyprus will join the ranks of southern European LNG importers when its FSRU offshore Vasilikos comes into operation, scheduled for the end of 2022/early-mid 2023. The US provided the majority of LNG cargoes to Croatia (82%), Greece (55%), and Malta (50%) in 2Q21.

East Mediterranean

Situated at the nexus of Europe, Asia, and Africa, the Eastern Mediterranean region has considerable export optionality for its abundant untapped gas reserves. The East Mediterranean countries of Egypt, Israel, and Cyprus are gas-rich and determined to get their gas to market despite regional geopolitical considerations, high capital costs, and fluctuating global LNG and gas prices. The introduction of ambitious net zero policies in advanced markets has introduced a further challenge to developing major gas and LNG export projects in the region – particularly as Europe and Asia are target export markets for the Eastern Mediterranean region.

In Egypt, exports from the 5 million tpy Damietta LNG export plant resumed in 2021 after an almost nine-year shutdown. Damietta's return to operations gives Egypt an additional export outlet, particularly for gas production from the Zohr field and gas imports from Israel's Tamar and Leviathan fields which started in 2020 under the Egypt-Israel gas export agreement. Egypt's other LNG export terminal – the 7.2 million tpy Idku terminal – ramped up loading of LNG cargoes over 2021 compared to 2020 rates due to higher LNG spot prices globally. Both Damietta and Idku have excess liquefaction capacity which could be utilised by gas produced in Israel and Cyprus.

The owners of the Tamar and Leviathan fields in Israel have considered proposals for offshore liquefaction (via an FLNG facility) for LNG exports at various times, but these proposals have not become a reality. In October 2021, Israel announced that it is considering the construction of a new gas pipeline between Israel and Egypt to increase supplies of Israeli gas to Egypt by an additional 3 billion m³/y to 5 billion m³/y, some of which could be liquefied at Damietta and Idku.

When the Aphrodite gas field was discovered in the Eastern Mediterranean Sea, offshore Cyprus in 2011, Cyprus switched its plans to become an LNG importer to an LNG exporter. The estimated reserves were subsequently downgraded, making an LNG export project potentially commercially unviable. The Aphrodite partners are also considering developing a pipeline to supply gas from Aphrodite to Damietta and Idku for export as LNG, although issues of cross-border unitisation between the vast majority of the Aphrodite field located in Cyprus' exclusive economic zone and a small part located in Israel's exclusive economic zone may need to be resolved before production could commence from Aphrodite.

The actual construction of these pipelines between Israel and Cyprus on the one hand and Egypt on the other are dependent on both strategic alignment between the infrastructure owners and regional co-operation at a political level. This goes hand-in-hand with price-specific considerations. It is unlikely that East Mediterranean LNG exports would be able to compete for supply to the premium Asian LNG market due to longer voyage times compared to LNG supplies from LNG export terminals closer to Asia. Consequently, it is likely that East Mediterranean LNG would be supplied into the European LNG market where delivered prices typically lag behind Asian delivered prices, or to the growing African LNG import market where there may be higher levels of political and credit risk.

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