

Year VII n°20 - July 2022 LNG and Natural Gas Market Outlook

REF  **OSSERVATORIO
ENERGIA**

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Despite the recent interruption of Nord Stream 1 combined with a higher than average thermoelectric demand, which led to a further tightening of the European gas market in the very short-term, our Reference scenario still assumes the fulfilment of existing Russian long-term contracts and that demand is in line with seasonal average temperatures. In this scenario, over the next winter season, prices would remain under strong upward pressure, supported by the European gas demand competing with Asian on the LNG world market, but would move on to a slow normalization path starting from the next summer.

Under the key assumptions on which the Reference scenario is based (normal winter temperatures, healthy Algerian flows and LNG arrivals, long term Russian contracts flows at least partially guaranteed and minimum flows towards Passo Gries), supply security issues would be limited to the highest 5% historical winter peak demand. However, with geopolitical tensions far from easing and an unprecedented, progressive and evident worsening of the gas market conditions since the conflict begun, a complete curtailment of Russian gas and flows cannot be ruled out, with flows from Tarvisio and Passo Gries consequently reduced to zero. This would push the risk for demand not being satisfied over the winter season to 34%.

The assumptions on which our scenarios are based do not include the triggering of gas price cap. Such a mechanism, significantly affecting the wholesale prices (and not the downstream subsidies as proposed in some cases) is expected to be implemented only in the event of rationing being needed/required. Rationing impact on the market would depend on its operational characteristics, which will be most likely decided at European level.

FRAME OF REFERENCE AND METHODOLOGY

REF-E Energy Outlooks are elaborated by MBS Consulting experts on the base of proprietary suites and market knowledge. Econometric and structural models, as well as our expert sensitiveness, detailed knowledge of regulation, and accurate monitoring of market outcomes underlie our elaborations.

Gas and electricity forecasts take into account the diverse geopolitical and economic hypothesis deriving from the potential war duration and outcome. The European Union and each single nation reaction to the disruption generated from the deterioration of both diplomatic and commercial relations with Russia are seen as key determinants of the future equilibrium of the energy markets.

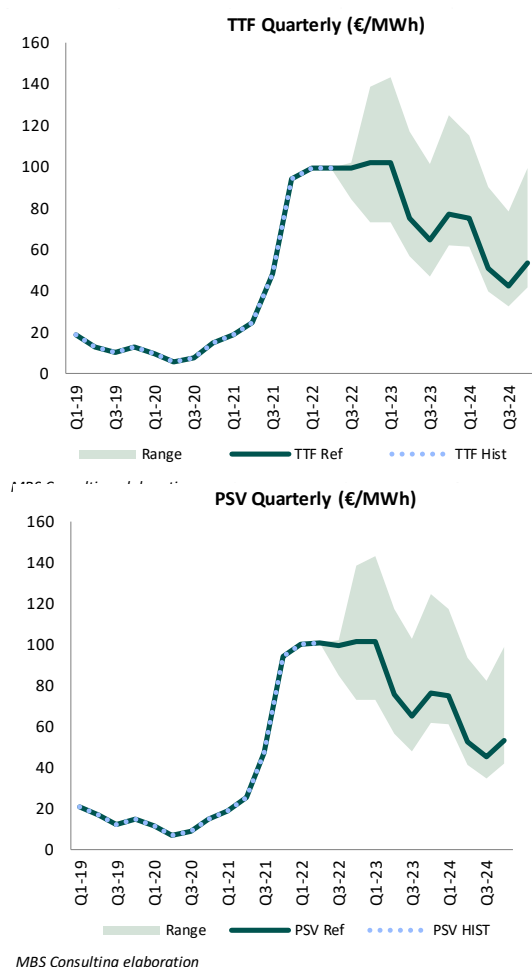
In this perspective, we defined three scenarios. The **Worst Case** is characterized by permanently high prices amid a long lasting conflict which would lead to import-export bans and economic retaliation, trade flows interruption, commodities supply sharp reduction, negative or zero economic growth and the energy transition process failure. In the **Reference scenario**, prices will remain high in the short-term amid diplomatic and commercial tensions, while the energy transition process will continue and dependence on Russian commodities will be reduced. Gas and other fossil fuels supplies from alternative routes will increase initially limiting prices upward potential and successively leading to a normalization path. The economic growth suffers a contraction over the next two years, followed by recovery. The **Best Case** scenario would materialize in the event of favourable weather conditions and a fast energy transition, supported by low inflation and a faster economic recovery, reducing demand over the next few years. This would limit prices upside potential and then fuel a downward acceleration.

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GAS MARKET OUTLOOK



Gas prices sharply increased worldwide amid persisting geopolitical tensions and a major readjustment of the market in progress; since January, with the TTF and the PSV are averaging close to 100 €/MWh, where they are expected to stabilize till the end of this year (this is a more than 10 €/MWh upward revision compared to our previous update release of Mar-22). Should tightness conditions in Europe and Italy ease, following an increase in Algerian and LNG imports and under the assumption that the Norwegian flows would be regular, both the TTF and the PSV References would return below 90 €/MWh in 2023. In the worst case scenario, should a further reduction of Russian flows combine with lower than average winter temperatures and/or LNG discontinuous production, due to accidents and/or unscheduled outages, maintain this year market tightness conditions, 2022 and 2023 prices would stabilize above 110 €/MWh and eventually ease below 100 €/MWh in 2024. A high reliance on LNG supplies would support the PSV-TTF spread, with regasification costs adding to transport costs. Overall, the spread dynamics would be characterized by high volatility, coherently with irregular Russian supplies and a consequently high degree of uncertainty on import flows variations. Only above average winter temperatures would push the TTF and PSV 2022 averages below 90 €/MWh. A combination of mild winters and fast renewables growth may lead prices on a

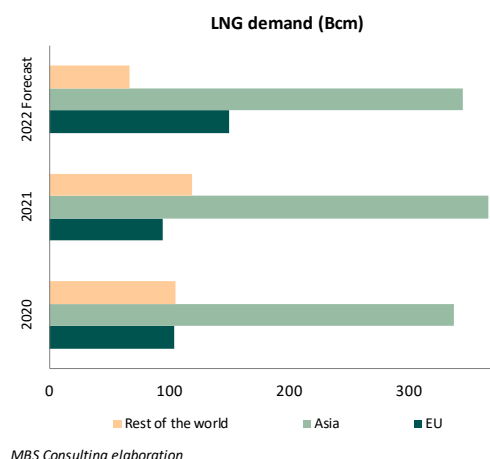
downward path. A tightening of the PSV-TTF spread would follow abundant Algerian flows, securing the majority of the volumes needed to meet the Italian national demand.

The World LNG Market: the European LNG Demand Growth Leads To Higher Competition

The need to reduce Europe dependence on Russian gas is defining a new import mix, with a shift towards more LNG supplies. Chinese economic growth slow-down and consequent demand contraction facilitated this shift. However, an eventual acceleration of Chinese growth in the second semester of 2022 would lead to higher fossil-fuels demand, such as coal, natural gas and LNG. China is in fact increasing imports of Russian gas through the Power of Siberia pipeline by 50%, or 5 billion cubic meters, this year, aiming at the full capacity of 38 billion cubic meters by 2025. Coal production resumed and will increase by the end of the year, but the LNG role is key to the Chinese economy and competition on the world market is expected to increase.

WORLD LNG DEMAND ON A GROWING PATH

Between Jan-2022 and Jun-2022, LNG import flows worldwide were 7% higher than in the same period last year. The European market weight was close to 30% of the total LNG demand, with 80 Bcm received since January (25 Bcm more than last year in the same period). Volumes were diverted from Asia, especially China, where during February's Beijing Olympics companies reduced output through environment control to limit air pollution and reduced output amid pandemic related lock downs. This led imports 10 Bcm lower (-20% y/y), Japan (-2% y/y), India and Pakistan (-17% and -2% y/y respectively), where high gas prices favoured thermal coal. A milder winter also weighed on demand. Volumes were reduced in Central and South America too, where Brazil gas demand for power generation was displaced by hydro power. Should the first six months LNG demand dynamics be replicated over the second half of this year, this would lead to the EU reaching the 150 Bcm import target, while Asian demand would decline 6% overall while the rest of the world demand, especially Central and South America, would have to be limited to pre-pandemic levels.

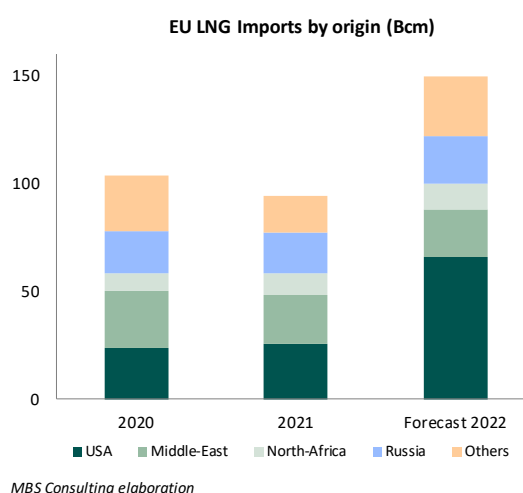


The combination of European surging demand and China's economic growth resumption would lead to a growing LNG demand over the coming years. Global LNG demand is expected to grow 7% in 2022, driven by Europe, which is looking for 150 Bcm to replace 50 Bcm of Russian gas. LNG demand for both 2023 and 2024 was revised at 4% higher, in line with the global regasification capacity growth rate (see below an in depth analysis of the regasification capacity growth).

2022 LNG demand in China is foreseen at 14% lower year on year; since restrictions are still in place, it could take months for demand to return to pre-lockdown levels. Overall NE Asia storages are healthy compared to the same period last year. However, as new regasification capacity should be deployed and the industrial sector should return to pre-lockdown levels, in 2023 demand is expected to recover the full 14% loss and continue to grow in 2024, close at 10% y/y.

However, South-Asia and South America LNG demand growth is assumed to remain subdued over the same period, with high gas prices still favouring thermal coal use. India LNG demand would in fact keep decreasing in 2023 (-4% y/y) and just recover 4% in 2024.

Europe LNG demand growth should persist in 2023 (+7% y/y) and slow to +1% y/y in 2024, coherently with liquefaction capacity growth and a partnering strategy with Qatar and the US, supported by the REPowerEU plan key decarbonization and independence from Russian supplies targets. More than 30 Bcm of US LNG were actually delivered over the first six months of this year and long-term contracts are expected to be negotiated for the next few years).



Therefore, in 2021, a decrease in the overall Asian demand, favored by China economic growth slowdown is assumed to free LNG supplies for the EU. However China and Europe LNG demand will compete for supplies from 2023, leading to an overall 4% demand growth both in 2023 and 2024.

The regasification capacity increase path supports LNG demand growth worldwide. In 2021 the global regasification capacity was 1330 Bcm, mainly concentrated in Asia (a total of 55%, of which 80% located in Japan, 40% in South Korea, and 17% in China). Based on the regasification projects underway around the world, global regasification capacity will grow by 4% in 2023. In China, 56 Bcm/y of additional capacity will be available by the end of 2023, +30% compared to 2022 and a further 15 Bcm/y will be added in 2024 (+8%), amounting to 24% of all Asian regasification capacity.

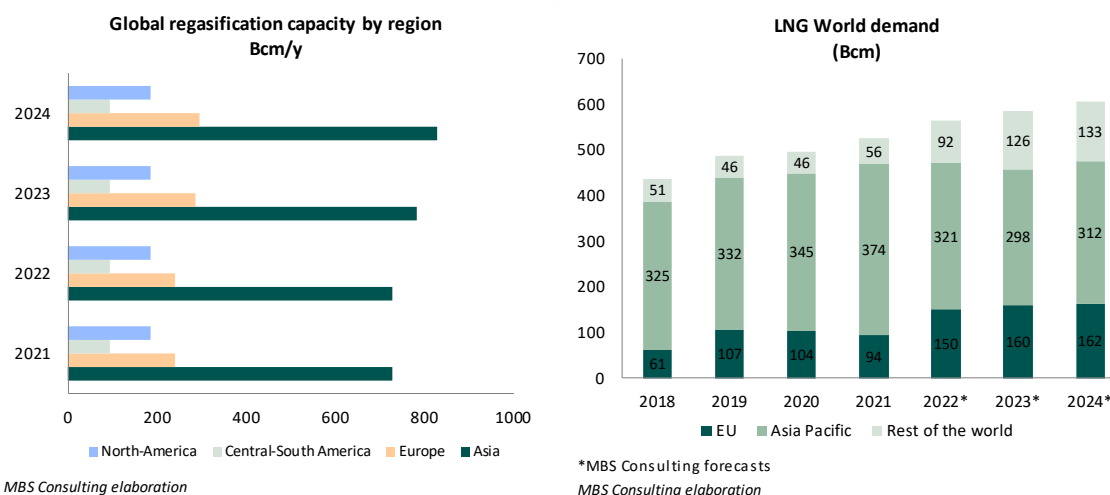


Table 1. Upcoming Regasification capacity

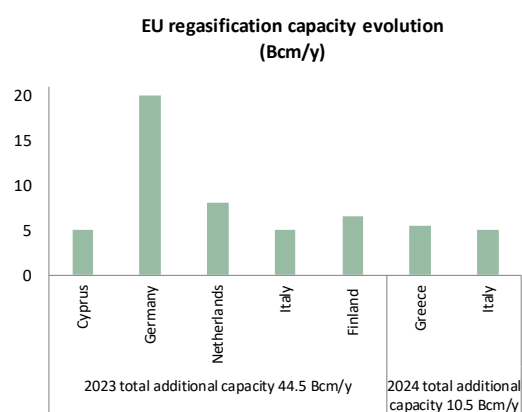
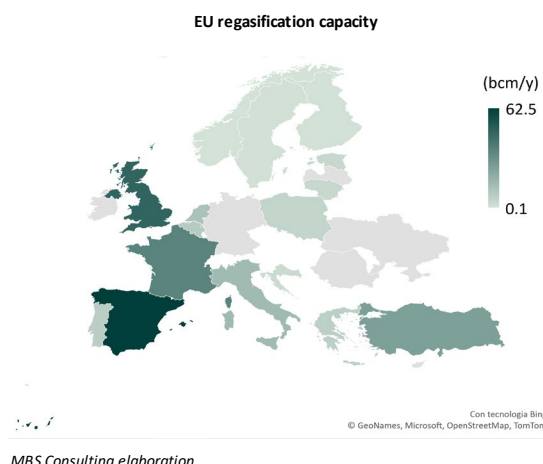
Region	Country	Plant	Expected Start Year	Capacity (Bcm/y)
Asia Pacific	India	Dhamra	2022	6.8
Asia Pacific	India	Jafrabad (Vasant 1 FSRU)	2022	6.8
Asia Pacific	India	Jaigarh (Hoegh Giant FSRU)	2022	6.8
Asia Pacific	India	Karaikal Port	2022	1.4
Asia Pacific	Indonesia	Jawa	2022	2.9
Asia Pacific	Indonesia	Teluk Lamong	2022	0.3
Asia Pacific	Philippines	Philippines LNG	2022	4.1
Asia Pacific	Philippines	Pagbilao LNG	2024	4.1
Asia Pacific	Thailand	Nong Fab, Rayong Province	2022	10.2
Asia Pacific	Vietnam	Hai Linh's LNG terminal	2022	4.1
Asia Pacific	Vietnam	Thi Vai I phase	2022	1.4
Asia Pacific	Taiwan	Datan Borough Taoyuan	2023	4.1
Asia Pacific	China	Tianjin Phase II, Tianjin province	2023	6.8
Asia Pacific	China	Yantai , Yantai port, Shandong province	2022	6.8
Asia Pacific	China	Tianjin Onshore Expansion II, Tianjin province	2023	6.5
Asia Pacific	China	Qingdao expansion III, Shandong province	2023	9.5
Asia Pacific	China	Longkou , Yantai port, Shandong province	2023	8.8
Asia Pacific	China	Nanshan LNG Phase I, Shandong province	2023	6.8
Asia Pacific	China	Binhai, Yancheng city, Jiangsu province	2023	4.1
Asia Pacific	China	Binhai, Yancheng city, Jiangsu province (Expansion I)	2023	4.1
Asia Pacific	China	Yangjiang, Guangdong province	2023	2.7
Asia Pacific	China	Huizhou LNG terminal, Guangdong	2024	8.4
Asia Pacific	China	Zhoushan expansion, Zhejiang province	2024	6.8
Asia Pacific	China	Putian LNG terminal	2025	7.7
Central-America	El Salvador	Acajutla	2022	0.7
Europe	Cyprus	Vasilikos	2023	2.4
Europe	Finland	Hamina	2022	0.1
Europe	Finland	FSRU Exemplar	Late 2022	6.5
Europe	Germany	To be defined	2023	5.0
Europe	Germany	To be defined	2023	5.0
Europe	Germany	Transgas Force	2023	5.0
Europe	Germany	Transgas Power	2023	5.0
Europe	Italy	Golar Tundra	2023	5.0
Europe	Italy	BW Singapore	2024	5.0
Europe	Greece	Alexandroupolis FSRU Terminal	Late 2023	5.5
Europe	Netherlands	S188	Late 2022	6.2
Europe	Netherlands	To be defined	Late 2022	1.8
Europe	Poland	To be defined	2027-2028	6.1
Total				191

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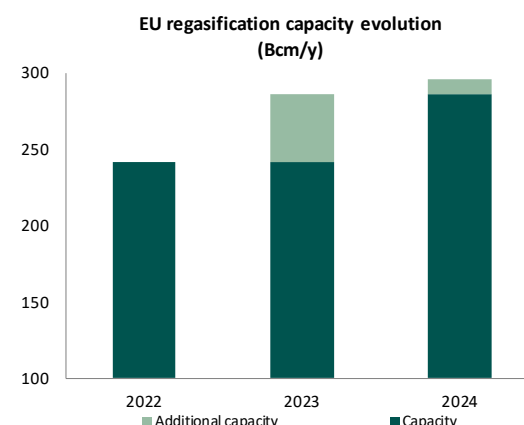
Europe has a regasification capacity of 241 Bcm/year, most of which is concentrated in Spain (26%), the UK (20%) and France (15%). Given the need of gaining independence from Russian gas supplies, Europe is adding regasification capacity at a very fast pace mainly by the acquisition of new Floating Storage and Regasification Units (FSRUs), which **will increase the regasification capacity by at least 44 Bcm/year by the end of 2023 (+18%), and further 10.5 Bcm/y (+4%) in 2024.**

To optimize the LNG import capacity growth, the interconnection capacity between market areas must be reinforced too. This would facilitate the LNG delivery to countries, such as Germany and Italy, where regasification capacity is still relatively low.

The acquisition of FSRUs (Floating Storage and Regasification Units) has significant advantages in terms of costs and timing compared to developing onshore regasification terminals, but could have drawbacks in the medium terms, since FSRUs have limited storage and modulation capacity.



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Over the last few months, the following European countries have chartered or bought new vessels, mainly as a reaction to the gas crisis:

- the Netherlands chartered two FSRUs for a total regasification capacity of 8 Bcm/year, expected to become operational in autumn 2022
- Germany chartered four FSRUs for at least 5 Bcm/year each, two owned by Höegh LNG, expected to be operational by early 2023, and two owned by Dynagas, possibly starting in 2023 as well and expected to be fully operational in 2024.
- Finland chartered the FSRU Exemplar (6.5 Bcm) owned by Excelerate, scheduled to become operational during next winter
- Italy approved a fast-track authorization designed specifically for FSRUs and SNAM purchased the Golar Tundra vessel (5 Bcm) owned by Golar LNG, expected to be operational in spring 2023, and the BW Singapore vessel (5 Bcm) that should be operational by the third quarter of 2024; two smaller FSRUs are planned in Sardinia, one in Porto Torres and the other in Portovesme (where the LNG carrier Golar Artic owned by Golar LNG will be converted into an FSRU). Moreover, the Ravenna Knutsen tank, originally employed in the small scale market, is now serving the LNG Reloading from Spain to Panigaglia.
- Cyprus converted a LNG carrier into a FSRU, expected to be operational by the first half of 2023.

- Greece will install an FSRU of 5.5 Bcm/year 17.5 Km from Alexandroupolis, scheduled to go into operation by late 2023
- Poland plans to install an FSRU of 6.1 Bcm/year in the Gulf of Gdansk, scheduled go into operation in 2027/2028

LNG LIQUEFACTION CAPACITY GROWTH SUPPORTED BY PRICE SIGNALS

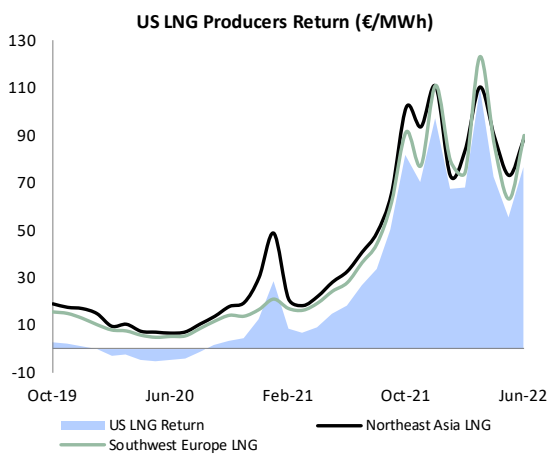
High prices incentivizing an acceleration in FIDs liquefaction plants projects and to make plants operational as soon as possible hardly compensate for the European LNG demand growth acceleration which puts pressure on the world demand growth, in a scenario with a high degree of uncertainty amid a likely war-led economic slow-down and investors constraints on the decarbonization process displacing gas, adding to pandemic related delays and logistic constraints.

North-American liquefaction projects are ramping up, with returns for LNG producers having significantly increased since Sep-2021, supported by high gas prices.

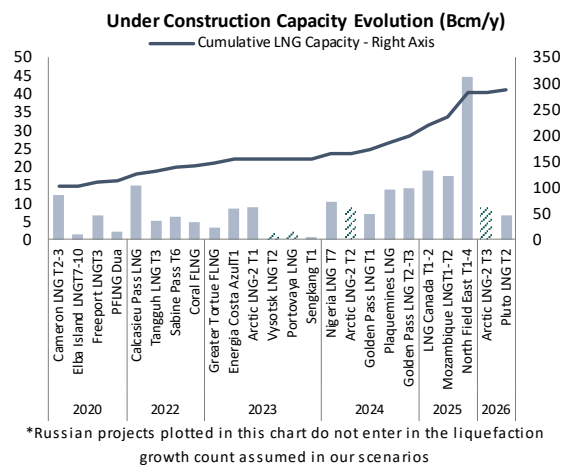
Since the beginning of this year, world liquefaction capacity increased by nearly 21 Bcm/year, since the Calcasieu Pass Plant and the sixth train of the Sabine Pass facility went into operation (both in the US).

The Magnolia LNG Plant and Export project inside the Lake Charles Harbor (Louisiana) is likely to receive a FID by the end of 2022, earlier than the scheduled 2023 deadline, and, still in Louisiana, Venture Global LNG recently announced a FID for the Plaquemines LNG Phase-1 export project (13.5 Bcm/year), which is expected to go into operation by 2024. Moreover, on June 2022, Cheniere announced a FID for the Corpus Christi Stage 3 LNG export project (13.5 Bcm/year) in US, where operation are scheduled to gradually start from 2025.

Overall, North America leads LNG supply growth, with almost 67 Bcm/year under construction and 245 Bcm/year in the pre-FID stage, most of which is expected to be approved by the end of this year. Further two new LNG projects are in pre-FID stage: the Commonwealth LNG Plant in the US and the Cedar FLNG facility in Canada (for additional 16 Bcm/year). Both should receive the FID by 2023.



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*Russian projects plotted in this chart do not enter in the liquefaction growth count assumed in our scenarios

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Table 2. Liquefaction Projects in Pre-FID Stage

Country	Plant	Expected FID	Expected Start Year	Capacity (Bcm/y)
Australia	Pluto LNG T2 (Scarborough)	FID Nov. 2021	2026	7
Cameroon	Cameroon FLNG Expansion	Not Defined	2026	1
Canada	Woodfibre LNG	2022	2025	3
Canada	LNG Canada Expansion T3-4	Not Defined	2026	18
Canada	Kitimat LNG	Shelved	2027	14
Canada	Goldboro LNG T1-2	Shelved	2025	13
Canada	Bear Head LNG T1-2	Not Defined	2023	3
Canada	Cedar FLNG	2023	2027	5
Indonesia	Sengkang Expansion T2-4	Not Defined	2026	2
Indonesia	Abadi LNG	Not Defined	2027	13
Mauritania	Greater Tortue FLNG T2	2023	2026	3
Mexico	MPL Puerto Libertad T1-2	2022	2024	16
Mexico	Vista Pacifico	Not Defined	2025	5
Tanzania	Tanzania LNG	2022	2026	14
Mozambique	Rovuma LNG T1-T2	2023	2026	21
PNG	Papua LNG T1-2	2023	2026	12
Qatar	North Field South Expansion T5-6	2022	2027	22
Russia	Baltic LNG T1-2	Shelved	2024	14
Russia	Obssky LNG T1	Shelved	2024	7
USA	Texas LNG Brownsville T1	2022	2025	3
USA	Texas LNG Brownsville T2	2022	2024	3
USA	Rio Grande T1-2	2022	2026	15
USA	Port Arthur LNG T1-2	2022	2024	15
USA	Plaquemines LNG Phase-1	FID May 2022	2024	14
USA	Magnolia LNG	2022	2026	12
USA	Lake Charles	2021	2025	20
USA	Jordan Cove	Shelved	2025	5
USA	Gulf LNG Pascagoula T1-2	Not Defined	2025	15
USA	Freeport LNG T4	2022	2026	7
USA	Corpus Christi LNG T4-7	FID June 2022	2025	14
USA	Driftwood LNG T1-2	2022	2025	22
USA	Delfin FLNG	2022	2025	18
USA	Cameron LNG T4	2022	2026	9
USA	Alaska LNG T1-3	Not Defined	2025	27
USA	CP2 LNG	2023	2026	27
USA	Delta LNG T1-T2	2022	2025	14
USA	Commonwealth LNG	2023	2026	11
Total				354

*Green highlighted lines indicate projects expected deadlines variations compared to our previous update

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Liquefaction capacity around the world is also growing, with Coral FLNG's floating facility in Mozambique and the third train of the Tangguh LNG plant expected to become operational by the end of this year, adding nearly 10 Bcm/year to global Indonesia LNG production.

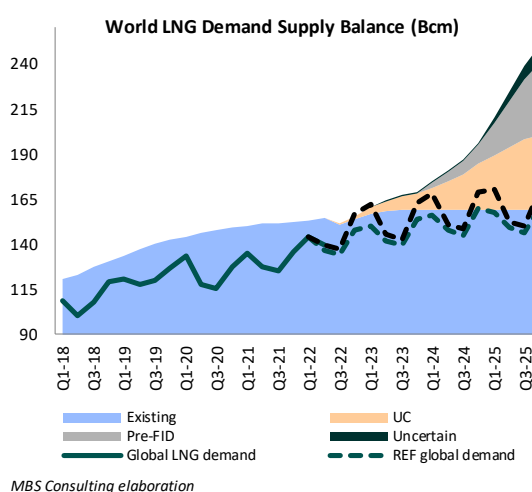
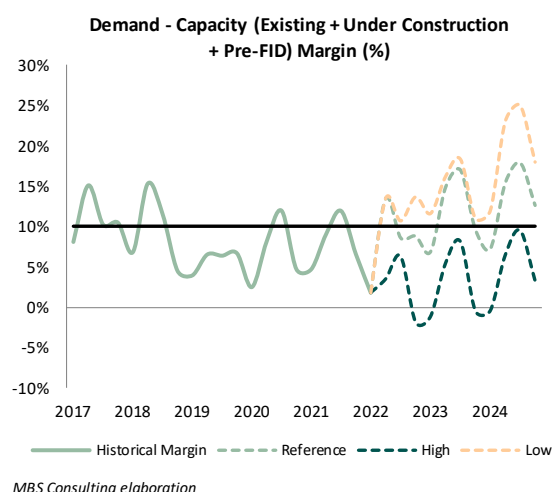
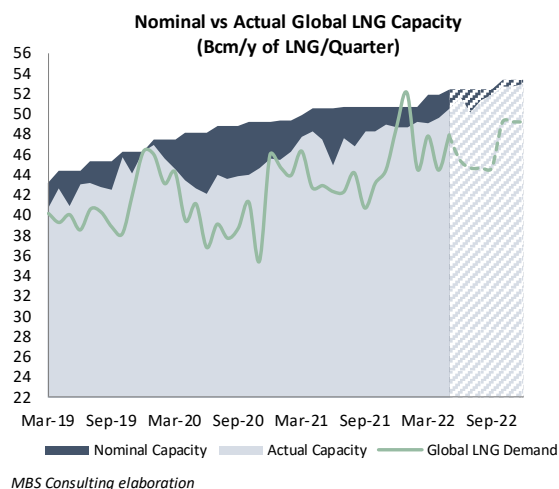
Both Australian and Middle Eastern LNG export volumes are expected to be relatively stable over the next few years: the Darwin LNG (Barossa) facility should start operations by 2025 and the first LNG cargo from Pluto LNG Train 2 should be shipped in 2026, while the Qatari North Field East mega project is not expected to start operations before 2025.

North Europe LNG export volumes will recover after Norway's Hammerfest LNG plant resumes production after a 20-month outage, with the LNG tankers Artic Voyager, Artic Princess and Artic Lady ready to receive cargoes from the plant.

Russian liquefaction projects are surrounded by uncertainty since sanctions block access to foreign technologies. The Arctic LNG three trains project was under contract with the German contractor Linde and suspended new Russian projects, in compliance with the EU policy. Therefore Arctic LNG 2 is presently considered not active. Instead the first 9 Bcm/y train is almost complete and can start operating in 2023, with Russia intensifying efforts to scale up its own liquefaction process to support the projects under construction.

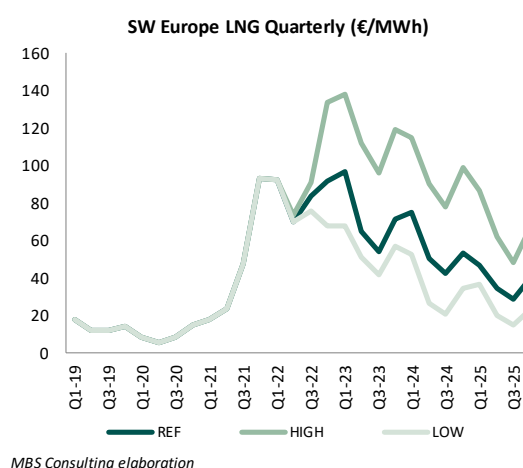
However, in the short-term, outages in the US Freeport plant enhance the risk of market tightness. Freeport LNG plant (20 Bcm/y) processes close to 20% of the US LNG. The plant will stay shut for at least three months because of a fire accident, reducing the US liquefaction capacity by more than 5 Bcm of LNG and affecting supplies to Europe.

Despite an encouraging perspective in terms of LNG supply growth, next winter the risk for market tightness is high, especially during the last quarter of 2022. In fact, any further unscheduled outage in some of the major liquefaction plants, or a higher than average demand amid low temperatures and/or a strong Chinese economic growth acceleration may lead the LNG market to severe imbalances. In fact, the actual demand-supply margin is lower than 10%, foreseen at the threshold to reasonably guarantee adequate coverage in less favorable than normal market conditions.



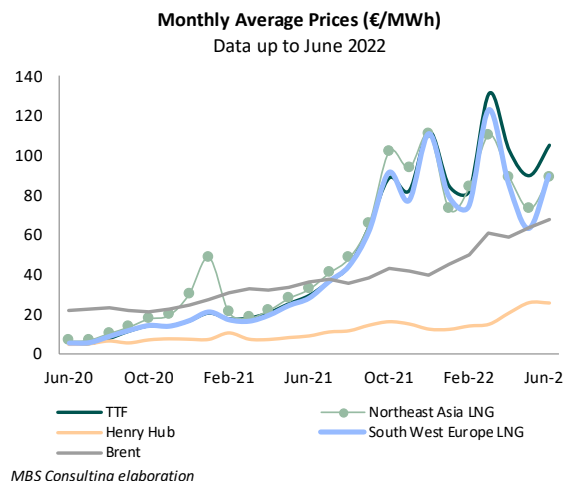
World LNG prices are therefore expected to remain high over the next winter season, with the South West Europe price averaging above 85 €/MWh in 2022, above 70 €/MWh in 2023 and supposed to decrease towards normalization only in 2024, when it should average 55 €/MWh. In the Worst Case Scenario, such as a colder than average winter and/or liquefaction plants significant unscheduled outages, the SWE benchmark could average above 115 €/MWh this year and close to 95 €/MWh in 2023.

The C-Oil market impact on the gas price trends has progressively diminished since 2010, leaving room for the LNG spot prices.



However, these remained linked to the Oil market, with long-term contracts pegged to the C-Oil price and, till 2020, the tighter the spot market became, the closer the LNG price was to the Brent indexed

formulas. Over the last year, the extreme spot market tightness (initially led by the Asian energy crises, followed by the European one) pushed both the Asian and the European LNG reference prices well above the Brent indexed formulas, with the world Gas market supply-demand dynamics not only decoupled from Brent, but now leading the fossil fuels sector itself. The Russian invasion of Ukraine and its dramatic impact on supplies and spot prices is now strongly incentivizing European buyers to stipulate long-term LNG contracts with US and Middle Eastern producers at significant premiums, either on the Henry Hub or on the Brent.



The European Gas Market: Russian Flows Disruption Pushes Prices Higher

Since the Ukraine conflict began, tensions on gas supplies mounts week after week.

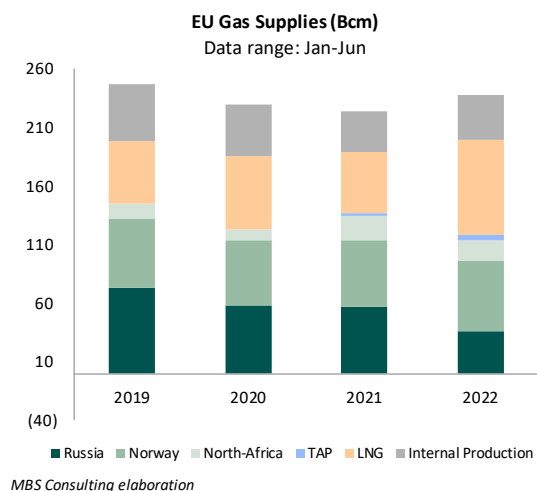
Gazprom stopped shipments to European companies which refused to comply with Kremlin's order to pay in rubles, forcing Europe to replace about 22 Bcm/year of Russian gas. Supplies to Poland and Bulgaria were cut in late April, while shipments to Finland were suspended on 21-May. Bulgaria and Finland import relatively little Russian gas (nearly 3 and 2 Bcm/year each), but the volumes under contract between the Polish PGNIG and Gazprom are much higher (10 Bcm/year). On 31-May, Gazprom suspended shipments to the Dutch gas trader GasTerra (the 4 Bcm/year contract expires in October and the supply cut means that about 2 Bcm of gas under that contract will not be delivered, the company claims that they have already found alternative suppliers). On 1-Jun, Gazprom also cut supply to Denmark's Orsted under a 1.8 Bcm/year contract and to Shell Energy Power under a 1.2 Bcm/year contract to supply Germany.

Since mid-June flows from the Nord Stream 1 pipeline connecting Russia to Germany have also decreased, with Gazprom claiming that the German engineering company Siemens failed to provide the equipment and the tools required for repairs, just weeks before the pipeline was scheduled to undergo its annual maintenance work. At the end of June, Nord Stream 1 monthly flows were almost 40% lower. This is forcing both Germany and Italy to replace Russian imports with other sources to fill storages, at higher prices.

EUROPEAN ALTERNATIVES TO RUSSIAN SUPPLIES

Since the beginning of the war, Europe had to consider different alternatives to reduce Russian gas dependence. Based on the latest months evidence and technical constraints analysis, options to replace Russian supplies are identified as follows:

- **Norway:** over the first six months of 2022 more than 60 Bcm were exported to Europe, a pace leading to 120 Bcm at the end of the year, which is in line with the volumes imported in 2021
- **Algeria:** between Jan and Jun-2021 imports from Algeria to Spain and Italy were 8Bcm and 11Bcm respectively. This year Italy has received 11.5 Bcm so far, but Spain only got 5Bcm. Algeria may shift part of its gas exports from



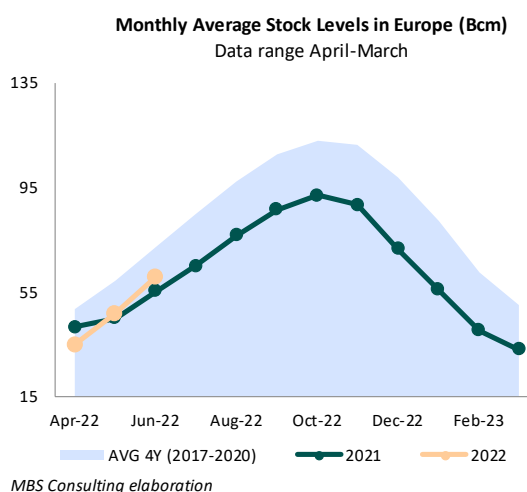
Spain to Italy, following Sonatrach and Italy's Eni agreement to accelerate the development of gas projects in Algeria, in line with Eni's strategy of diversifying energy sources. The agreement would raise gas flows in the Transmed pipeline starting from this year, reaching 9 Bcm/y of additional gas by the end of 2023, leading to an overall volume of 30 Bcm/y to be sent Italy

- **Libya:** yearly gas imports through the Greenstream pipeline (connecting the African country to Italy) have gradually decreased from 5.7 Bcm in 2019 to 3.2 Bcm in 2021. Since the beginning of this year, Libya sent to Italy only 1 Bcm, a volume more than 50% lower compared to 2019. The African country represents a supply option that could provide flexibility, but so far, it is underperforming.
- **TAP:** since January-22, 5 Bcm of natural gas were delivered, in line with its maximum capacity of 10 Bcm per year
- **Internal production:** Since the beginning of 2022, Europe has increased gas internal production by 7% compared to the same period in 2021, despite Dutch government decision against Groningen production resumption, which was under consideration as a way to replace Russian gas imports and to refill natural gas storages. The Netherlands will rely on LNG imports and, excluding Groningen gas field, the European internal production does not represent an alternative to Russian gas supplies
- **LNG:** so far, 80 Bcm were imported through LNG cargoes. With the regasification capacity in Europe being above 240 Bcm/y, the 150 Bcm targeted by the European Union by the end of 2022 to replace Russian supplies remain the most reliable perspective, leading to high competition in the world LNG market and a to high risk due to commercial, logistics and price tensions.

EUROPEAN STORAGES

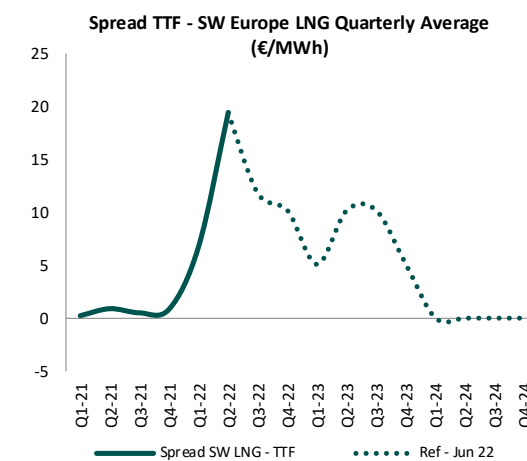
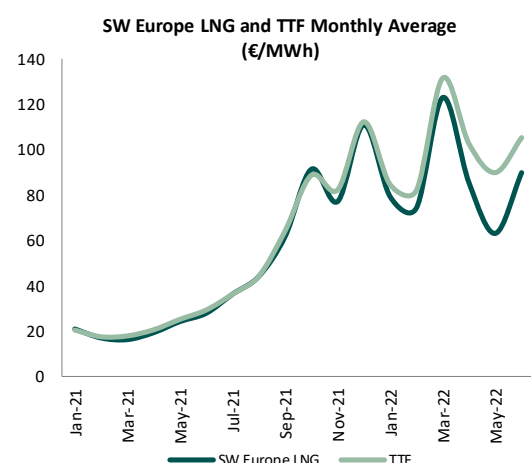
In June European stock levels were at 60 Bcm (50% full on average), which is higher than the previous year, but still 16% below average.

The latest gas prices increase, following the reduction of Russian gas flows, is keeping the time-spread close to zero (with short-term dips in negative territory), which adds to the Russian flows scarcity in limiting injections. Should storages refilling continue at the current path, the European stocks could end the injection season 90% full, 18% above last year, but still 3% below average.



EUROPEAN GAS PRICES: TTF-SWE SPREAD STAYING IN POSITIVE TERRITORY IN THE SHORT-TERM

The more independence from Russian gas imports is gained, the higher the European market correlation to the world LNG market is expected to become, now it is weighting 34% in the import mix (56% more LNG imports than in 2021, partially compensating for a 38% reduction of Russian supplies, combined to a 8% increase of Norwegian imports and also with 2 additional Bcm from TAP).



The European gas market is therefore seen/expected to remain LNG driven, with a stable and significative/meaningful correlation between the TTF and the SWE LNG price. Consequently, the expectation of the LNG market remaining under pressure over the next two years leads to high TTF prices. In the Reference Scenario, the TTF premium over the LNG averages above 10 €/MWh in 2022, given that the scarce flows increase from alternative routes is not in competition with the LNG, but would close to just above 7.5 €/MWh in 2023 and move back to zero in 2024, following a gradual increase of arrivals from Nord Africa and Azerbaijan.

The Italian Gas Market: Persistently High Prices Weigh on Demand

High LNG and TTF references till 2023 keep the PSV under upward pressure too. This is impacting negatively on residential demand, with price elasticity already evident over the past winter months. Algerian flows combined with LNG arrivals are key in meeting a sustainable supplies diversification target, while storages struggle to reach the 90% target by the end of the injection season.

ITALIAN GAS DEMAND

Over the first six months of this year the Italian gas demand was 2% below that of the same period in 2021, amid an industrial and retail demand reduction (-8% and -6% respectively between Jan-Jun). The distribution network's demand reduction was mainly driven by price effect since temperatures during winter months were similar to those of 2021. Residential demand statistics from last September onward show an almost 2 Bcm reduction correlated to the parallel strong price increase. The observed demand is in fact still lower than that expected, when considering temperatures impact.

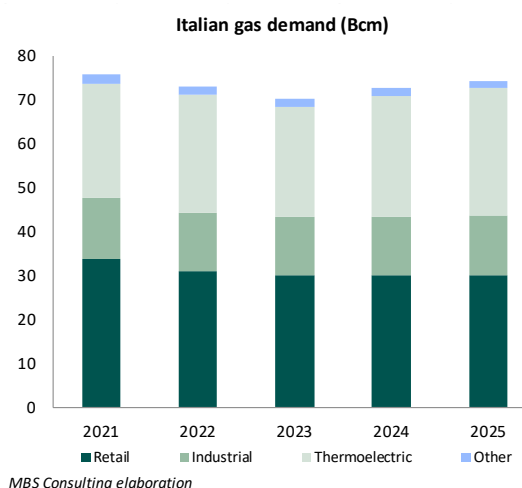
Instead, the thermoelectric demand rose by 6% amid lower renewable production, especially hydro.

Italian gas demand is expected to stabilize below

2021 levels, under the weight of the retail and industrial sectors. Retail is expected to be still suffering from high gas prices, while for the industrial demand negative impact of the slowing economic growth is expected to add to that of inflated prices.

In our Reference Scenario, the 2022 Italian demand is expected to be lower than that of 2021 (-4%), due to the sharp reduction of both the retail and the industrial demand (-8% and -5% respectively). On the contrary, the thermoelectric sector demand is expected to be 4% higher this year, as gas will be needed to compensate low hydro generation levels amid severe droughts.

In 2023 the Italian demand is expected to further decrease by 4%, driven by the thermoelectric sector (-6%) under the assumption that hydro generation will recover to average values and coal plants production will be resumed. Retail demand is anticipated to be lower than that of the previous year. Such reduction is based on the hypothesis that temperatures will be in line with the last 5 years average (and thus above those of 2021 and 2022). In 2024-2025 demand is expected to recover, driven by the thermoelectric sector, amid the gradual coal plants phasing-out.

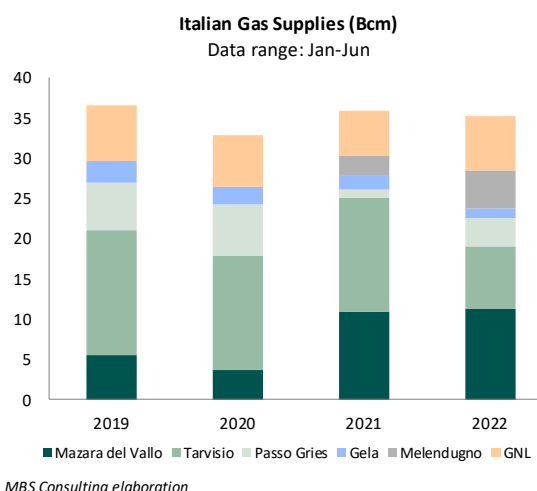


ITALIAN IMPORTS: ALGERIA PLAYS A KEY ROLE IN REDUCING DEPENDENCE ON RUSSIA

During the first semester of this year, the Italian gas imports were 2% lower than those of the same period in 2021, with Russian flows having diminished by -45% (more than 6 Bcm) compared to 2021.

The missing gas volumes from Russia have been so far replaced by:

- Northern Europe imports at Passo Gries (+2.5 Bcm), which tripled compared to the first semester of 2021
- TAP flows (+2.3 Bcm more than between Jan-Jun 2021)
- LNG arrivals, 17% higher than in the first semester of 2021, equal to 1 additional Bcm



North African gas imports, especially from Algeria, will be key to reduce dependence on Russian gas, with the recent reduction of Russian flows at Tarvisio adding concerns on supply security. For Italy, Algerian gas imports and LNG arrivals are the most relevant options to compensate for Russian gas imports.

Algerian gas imports are expected to reach 30 Bcm/y starting from Oct-23, with 9 Bcm/y recently put under contract and delivered through the Transmed pipeline. A gradual increase in volumes is assumed in the Reference Scenario, with 5 Bcm/y added to the 21 Bcm/y received over thermal in 2021/2022.

In the very short term (2022 and 2023), LNG arrivals play a central role in compensating the Russian flows reduction. The new FSRU put under contract put under contract by SNAM, starting during 2023 second semester, will provide an additional 5 Bcm/y, bringing the total regasification capacity to 21 Bcm/y, covering 30% of the 2023 demand.

However to push gas imports from Russia below 10 Bcm/y, it would also take an increase in imports from Norway through Passo Gries. This would only be guaranteed in the event of abundant LNG arriving in northern Europe, which would reduce the risk of tensions in the market and lead to a closing of the TTF-SWE price spread. Should flows from Northern Europe remain unchanged or decline (in the event that Russian flows to Germany through the Nord Stream 1 would not resume), reliance on LNG would increase further in thermal years 2022/2023 and 2023/2024 when new liquefaction capacity could be fully exploited.

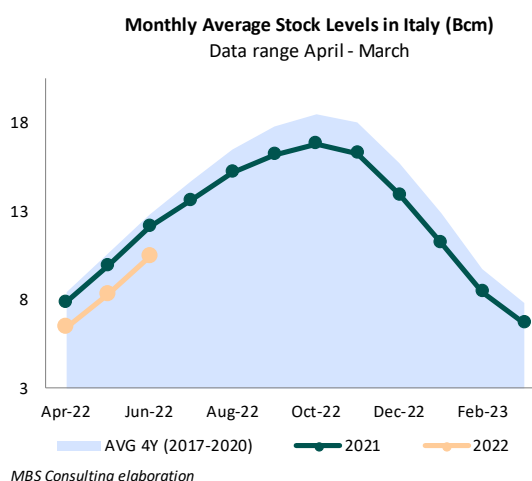
ITALIAN STORAGES AIMING AT A 90% FILLING TARGET

Despite several interventions to incentivize injections (see [Newsletter 265](#)), Jun-22 Italian storages were 54% full (compared to an almost 70% historical average), making it necessary to inject almost 7155 Mcm by the end of October to reach the 90% refilling target in the context of supply security regulation driven by EU guidelines and the Italian Government operational rules.

Based on the past years reaching the above target this is still technically possible, but it is necessary to fill the storage at a sustained rate, which is not in line with the latter months injection rate.

Significantly uncertain market conditions, with extremely high spot prices and almost null time-spreads adding to the difficulty for the operators to secure supplies, are in fact disincentivizing injection operations.

The Italian Government with a series of regulatory intervention provisions is therefore forcing injection activity by public operators. Snam injected nearly 800 Mcm in April (equalling to the volumes guaranteeing system security over the next winter) following the 165/2022 ARERA resolution, obliging the TSO to inject the volumes needed to the safe operational security of the system by the end of April. The Italian TSO was then appointed as the last resort buyer to reach June refilling target of 5.4 Bcm, leading to a refilling rate of 50 Mcm/d on average during the last week of June. To assure that the overall 90% refilling target is reached, the MITE issued another resolution in June asking the GME to support the storages injections as a last resort buyer, until a maximum of 4 billion€.



KEY RISKS TO THE ITALIAN SECURITY OF SUPPLY

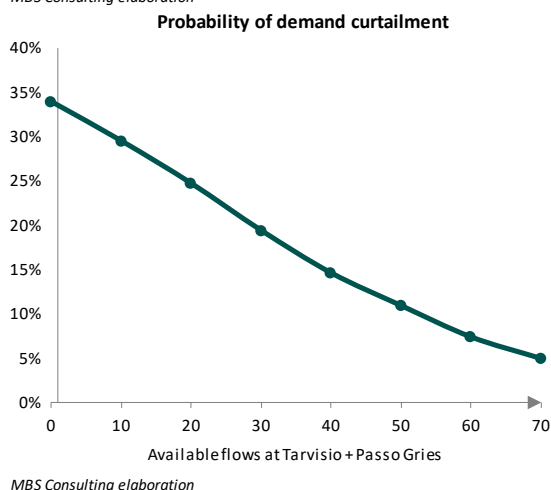
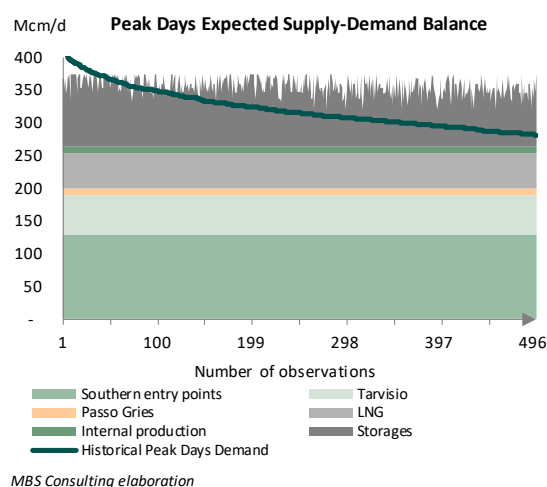
Under the key assumptions on which the Reference scenario is based (normal winter temperatures, healthy Algerian flows and LNG arrivals, long term Russian contracts flows at least partially guaranteed and minimum flows towards Passo Gries), supply security issues would be limited to the highest 5% historical winter peak demand.

Under the assumptions of:

- record levels imports from the Southern entry points,
- storages reaching the overall 90% refilling target,
- import flows from North averaging at 70 Mmc/d (that is assuming volumes from Russia still arriving and Northern Europe not facing scarcity issues at the same time as Italy and therefore flows arriving to Passo Gries),

demand exceeding 375 Mmc/d (representing in fact the highest 5% historical daily winter demand) would risk not to be covered. In this event, strategic storage volumes or a demand cut may become necessary.

Any additional supply curtailment would increase the probability for demand not being covered. The event of a complete curtailment of Russian gas and consequently flows from Tarvisio and Passo Gries reduced to zero would push the risk for demand not being satisfied over the winter season to 34%.



NORTH EUROPE FLOWS PIVOTAL ROLE KEEP THE PSV-TTF SPREAD POSITIVE IN THE SHORT-TERM

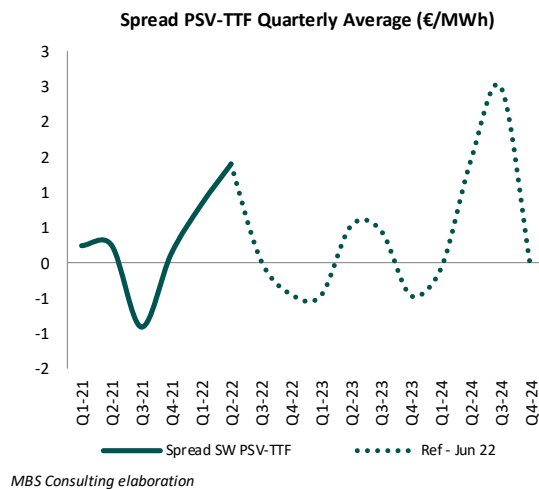
In our Reference Scenario, the combination of the assumed increases of gas imports from Algeria, LNG liquefaction capacity and Norwegian flows described above is key to reduce dependence on Russia and to preserve the Italian gas market equilibrium.

Assuming also Algerian gas prices still being oil linked, therefore cheaper than spot European gas hubs linked prices, and the TTF-SWE spread remaining positive till winter 2023/2024, this would result into a PSV-TTF seasonal pattern of compression towards zero in winter and widening in summer, when the imports from Passo Gries weight on the Italian import mix increase. A positive correlation between the PSV-TTF spread and inbound flows from Passo Gries is in fact in

evidence. Therefore, as long as spot volumes from Norway are needed to compensate for the expected gradual reduction of imports from Tarvisio, the PSV maintains a premium on the TTF. The price averages just below 101 €/MWh in 2022, close to 80 €/MWh in 2023 and still above 55 €/MWh in 2024.

The Worst Case Scenario would realize if a slower increase of the Algerian flows and tensions on gas supplies in Northern Europe (which would reduce the availability of imports from Passo Gries) combine to higher LNG prices. In this event, the 2022 PSV would average close to 110 €/MWh and the 2023 one above to 120 €/MWh, while in 2024 the price would move just below 100 €/MWh.

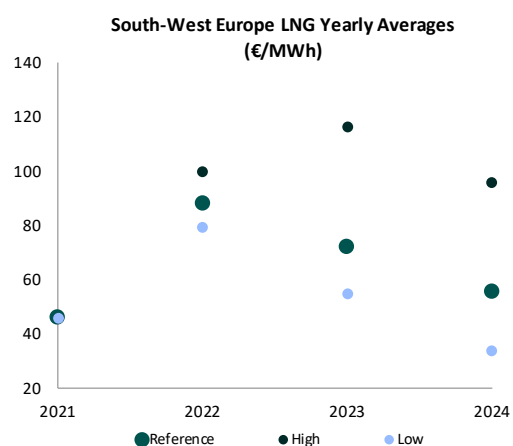
It would take a demand reduction worldwide and in Europe (amid higher than average winter temperatures), emphasized by a further reduction led by a fast development of renewables lowering the thermoelectric sector consumptions to shape the Best Case Scenario, where the upward trend in place would reverse more sharply and faster than in the Reference. In this event both the TTF-SWE and PSV-TTF spreads would close since the LNG would lose its pivotal role in compensating for the Russian flows reduction and the increased imports from Algeria would be enough to cover the Italian demand.



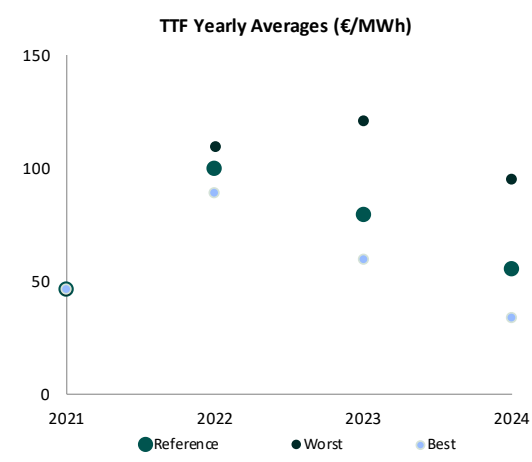
GAS YEARLY PROJECTIONS SUMMARY

Scenario		South-West Europe LNG (€/MWh)	TTF (€/MWh)	PSV (€/MWh)	PSV-TTF Spread (€/MWh)
Reference	2022	88	100	100	0.5
	2023	72	80	80	0.0
	2024	55	55	56	0.9
Worst	2022	100	110	110	0.6
	2023	116	121	122	0.3
	2024	96	96	98	2.2
Best	2022	79	89	90	0.6
	2023	55	60	59	-0.3
	2024	34	34	35	0.8

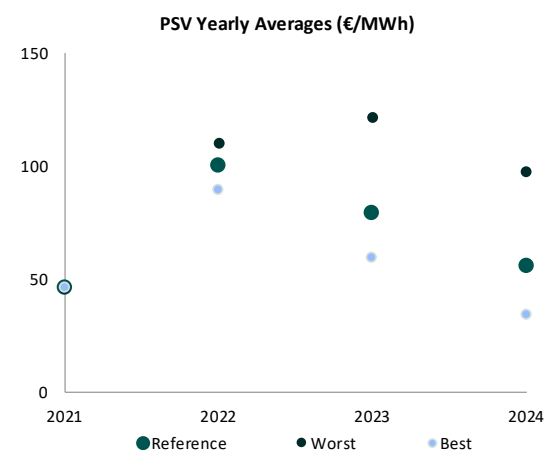
MBS Consulting elaboration



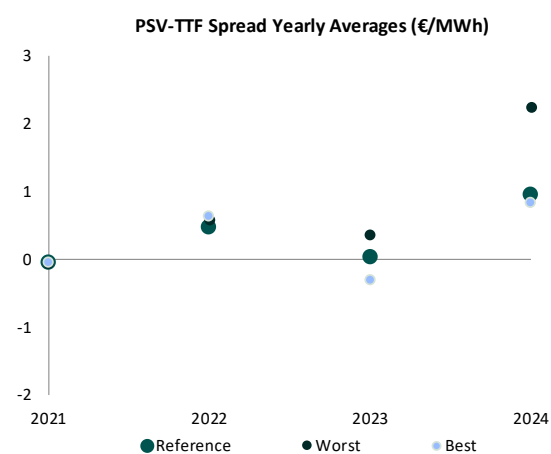
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