GECF

MONTHLY GAS MARKET REPORT

March 2023

Contents

List of Figures

List of Tables

Highlights

Global economy: Global GDP growth for 2023 is expected to slow to 2.9% y-o-y, an upward revision of 0.2 percentage points compared to the IMF's previous forecast. Global inflation is expected to gradually decline to 6.6% in 2023, as major central banks are persistent with the policy of increasing their benchmark interest rates.

Gas consumption: EU gas consumption dropped by 0.1% y-o-y to reach 38.5 bcm in February 2023, driven by the mild weather, which affected demand for heating in the residential sector, as well as by the implementation of the EU regulation on coordinated gas demand-reduction measures. The UK industrial sector recorded its first increase in gas consumption in over a year, with a y-o-y rise of 8%. The growth is a result of lower short-term hub gas prices. US gas consumption declined by 5.9% y-o-y driven by warmer temperatures and a slowdown in the industrial activity.

Gas production: Europe's gas production in January 2023 remained steady at 17.4 bcm compared to January 2022. However, it decreased by 1% m-o-m. In February 2023, the US lower 48 dry gas production totaled 77.8 bcm, indicating a 5.5% y-o-y growth. The number of global gas rigs increased by 5 units in February 2023 compared to the preceding month, reaching 417 units.

Gas trade: In February 2023, pipeline gas imports into the EU recorded a 5% decline m-o-m to reach 12.0 bcm. Global LNG imports expanded by 7.5% y-o-y to 34.2 Mt. The stronger import volumes were supported by an increase in in Asia Pacific, Europe and North America, which was offset by lower imports in LAC and MENA regions. Asia Pacific recorded the first monthly y-o-y increase in LNG imports since October 2021, driven by higher imports in China, Malaysia and South Korea. In Europe, LNG imports continue to expand amidst lower pipeline gas imports.

Gas storage: In February 2023, underground gas storage levels in the EU reached a record February level of 68.5 bcm, representing 66% of the region's capacity. In the US, underground gas storage declined to 63.3 bcm, or just 47% of capacity. The amount of LNG estimated in storage in Japan and South Korea reached 9.4 bcm. Storage withdrawals have been lower this winter due to milder than expected weather conditions.

Energy prices: Gas and LNG spot prices in Europe and Asia declined for the second consecutive month. In February 2023, TTF and NEA LNG spot prices averaged $16.73/MMBtu and $15.96/MMBtu decreasing by 16% and 23% m-o-m respectively. Soft market fundamentals including tepid demand due to mild weather, ample supply and robust cargo availability across both regions weighed on spot prices. Buying interest from northeast Asia remained muted. However, there was some emerging demand in price-sensitive markets in southeast Asia.

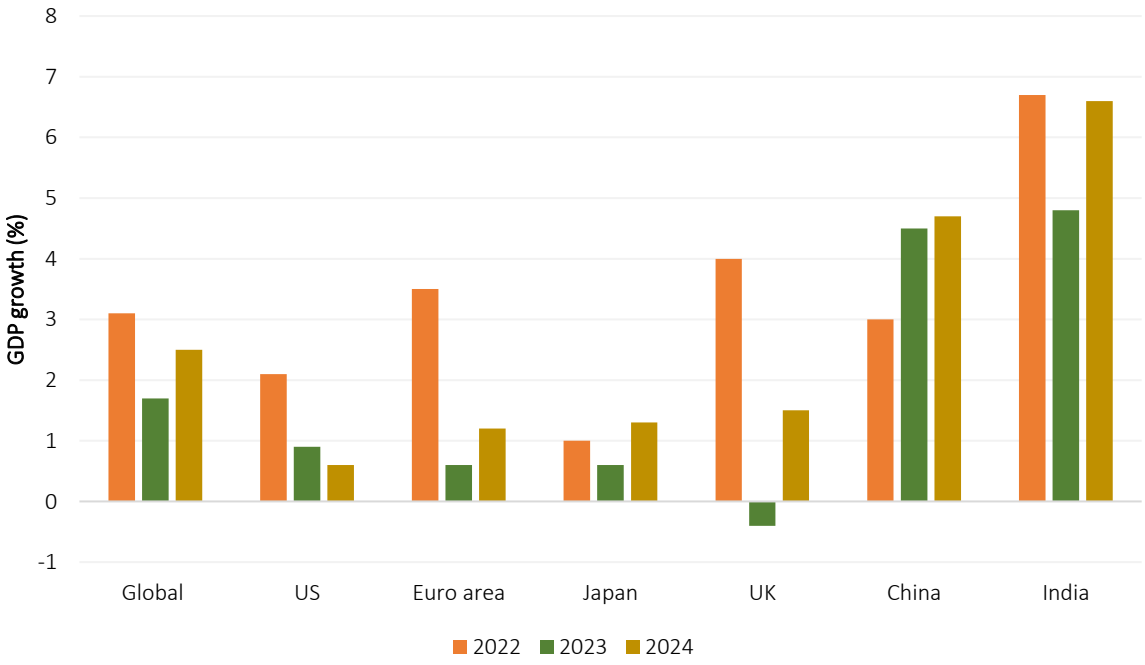
1 Global Economy

The outlook for global economic growth in 2023 seems to be slightly more optimistic than initially expected a few months ago. Oxford Economics has raised its global GDP growth forecast for 2023 to 1.8% in its World Economic Prospects March 2023 report, compared to 1.5% just one month ago. Furthermore, it estimated global GDP to rebound slightly to 2.5% in 2024. Some advanced economies including the US and euro area, performed better-than-expected in the first two months of the year however, downside risks remain prevalent (Figure 1).

GDP growth in advanced economies (AEs) is expected to slow significantly from 2.6% in 2022 to 0.7% in 2023. However, GDP growth in AEs is expected to rebound to 1.2% in 2024. In the US, GDP growth is forecast to slow from 2.1% in 2022 to 0.9% in 2023. The US labour market remains robust and consumer spending remains strong. In the euro area, GDP growth is expected to slow significantly from 3.5% in 2022 to 0.6% in 2023. While economic conditions are steadily improving, GDP growth in the region is expected to remain relatively flat in Q1 2023.

GDP growth in emerging markets and developing economies (EMDEs) is forecast to decline slightly from 3.7% in 2022 to 3.2% in 2023. Furthermore, GDP growth in EMDEs is expected to rebound to 4.2% in 2024. In China, GDP growth is projected to accelerate from 3% in 2022 to 4.5% in 2023, and further to 4.7% in 2024. In its recent Government Work Report (GWR), the Chinese government set a GDP growth target of around 5% in 2023, and intends to prioritize economic stability and domestic consumption growth, with hydrocarbons expected to play a key role in meeting this target.

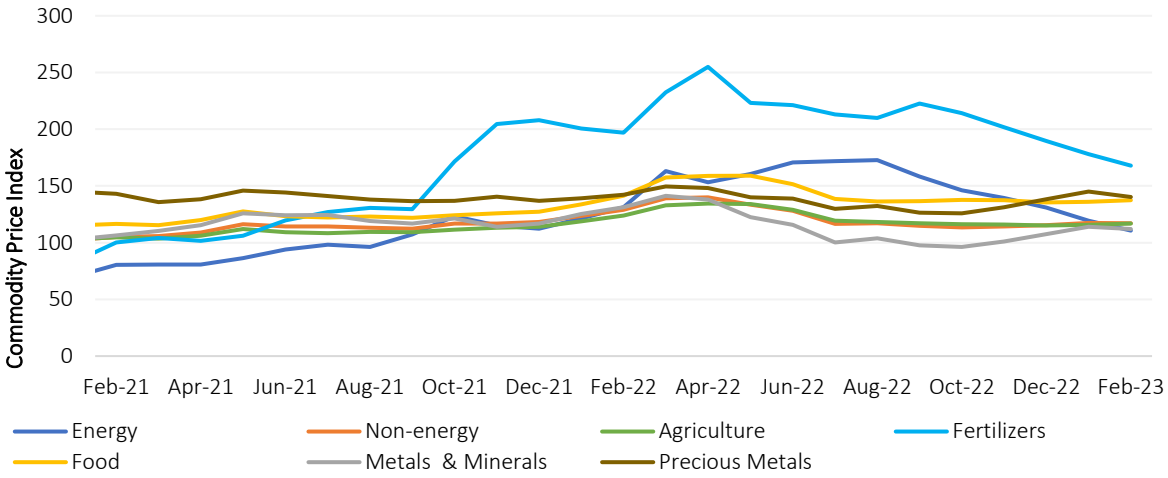
Figure 1: GDP growth forecast



Source: GECF Secretariat based on data from Oxford Economics

With regard to commodity prices in February 2023, the energy price index declined by 7% m-o-m, and was 16% lower y-o-y, as oil, gas and coal prices continued to decline on weak market fundamentals. Meanwhile, the non-energy price index was relatively stable compared to the previous month. However, it was 9% lower y-o-y. With regard to the non-energy sectors, the agriculture price index increased slightly by 1% m-o-m and the metals and minerals price index was 2% lower m-o-m. Meanwhile, the fertilizer price index continued to decline, sliding by 6% m-o-m and was 15% lower y-o-y (Figure 2).

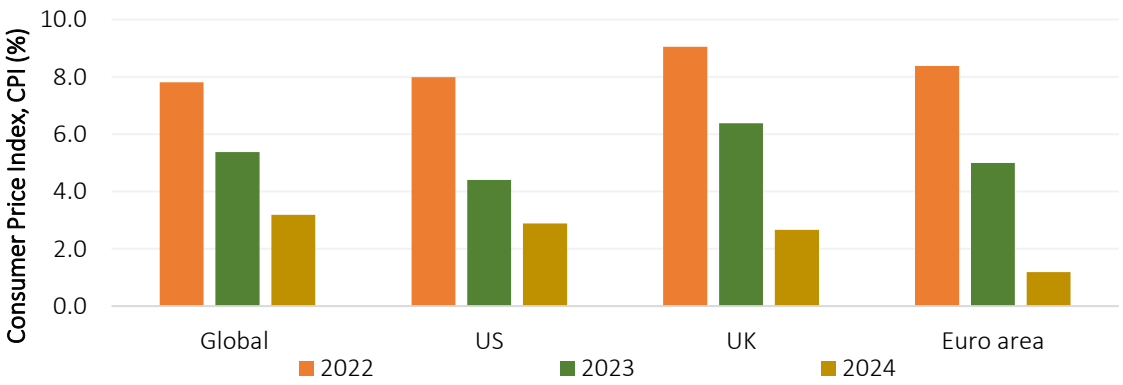
Figure 2: Monthly commodity price indices



Source: GECF Secretariat based on data from World Bank Commodity Price Data
Note: Monthly price indices based on nominal US dollars, 2010=100, 1960 to present. The energy price index is calculated using a weighted average of global crude oil (84.6%), gas (10.8%) and coal (4.7%) prices. The non-energy price index is calculated using a weighted average of agriculture (64.9%), metals & minerals (31.6%) and fertilizers (3.6%).

Global inflation is anticipated to gradually weaken to 5.4% in 2023, after which it declines further to 3.2% in 2024, according to the latest data from Oxford Economics. In the US, a tight labour market and high consumer spending has kept inflation elevated. Inflation in the US is forecast to average 4.4% in 2023 and then decline to 2.9% in 2024. In the UK, inflation is anticipated to average 6.4% in 2023, after which it drops to 2.7% in 2024. Meanwhile, in the euro area, inflation is forecast to average 5% in 2023, after which it drops to 1.2% in 2024 (Figure 3).

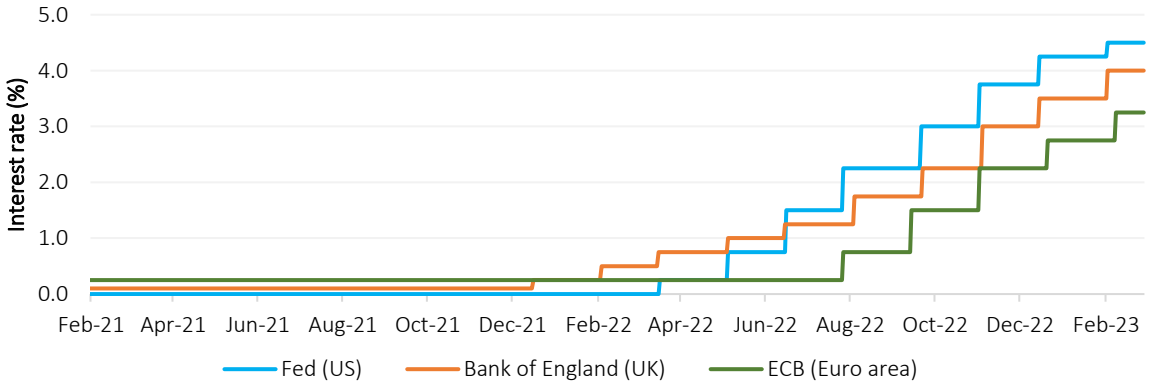
Figure 3: Inflation rates



Source: GECF Secretariat based on data from Oxford Economics

The US Federal Reserve, the Bank of England (BOE) and European Central Bank (ECB) increased their interest rates in early February 2023. The US Fed's benchmark lending rate at the end of February 2023 stood in the range of 4.5 – 4.75%. Meanwhile, in the UK, the BOE benchmark interest rate was 4%. The ECB's key interest rates on the main refinancing operations, marginal lending facility and deposit facility was 3%, 3.25% and 2.5% respectively as shown in (Figure 4). US Fed policymakers have indicated that further hikes are expected in the upcoming months in order to bring inflation down to its targeted 2%. Furthermore, the collapse of Silicon Valley Bank (SVB) in early March has raised some concerns about the resilience of global banking systems to rising interest rates. In response to this, the Fed has set up an emergency lending program to buffer other US banks.

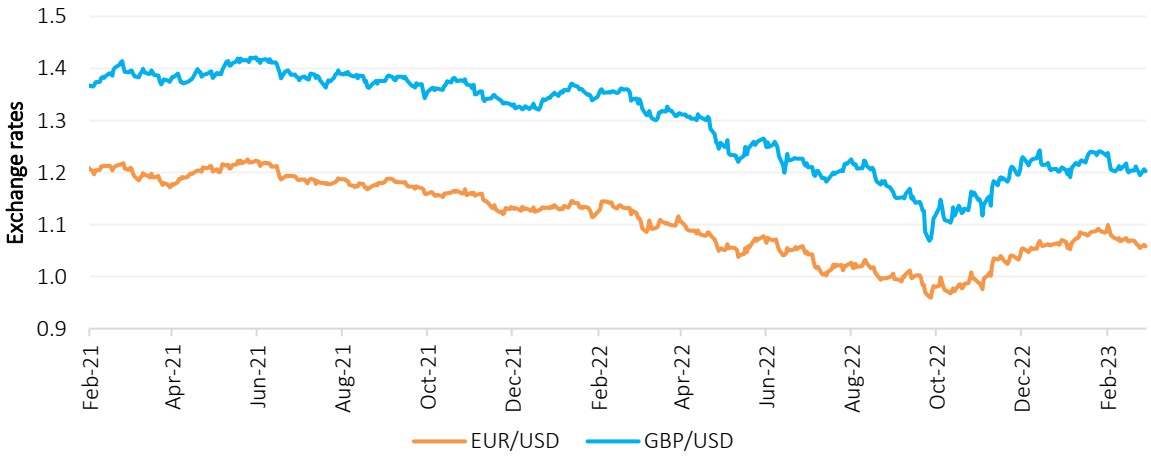
Figure 4: Interest rates in major central banks



Source: GECF Secretariat based on data from US Federal Reserve, European Central Bank and Bank of England

In February 2023, the euro and British pound weakened slightly against the dollar. The euro was valued at an average of $1.0705, decreasing 1% m-o-m and was 6% lower y-o-y. Meanwhile, the British pound was valued at an average of $1.2082, decreasing 1% m-o-m and was 11% lower y-o-y (Figure 5). Inflation in the euro area was slightly lower compared to the previous month, averaging an estimated 8.5% compared to 8.6% in January 2023.

Figure 5: Exchange rates



Source: GECF Secretariat based on data from Refinitiv Eikon

2 Gas Consumption

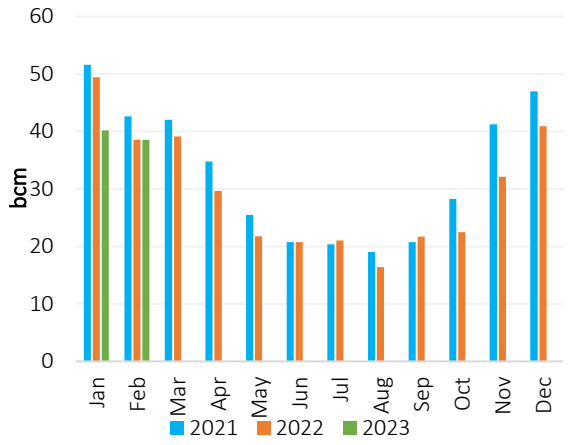
2.1 Europe

2.1.1 European Union

In February 2023, total European Union (EU) gas consumption recorded a drop of 0.1% y-o-y to reach 38.5 bcm (Figure 6). The continuance of the implementation of the EU regulation 2022/1369 of 5 August 2022 to reduce gas consumption combined with the mild weather during the month, which decreased the gas demand for heating in the residential sector, were the main drivers of the drop. Temperatures during the month were 1.3 degree above seasonal norm. The drop in spot gas prices in Europe also resulted in a slight recovery in the gas consumption in the industrial sector. Moreover, lower wind output during the month enhanced the use of gas in the EU power generation mix.

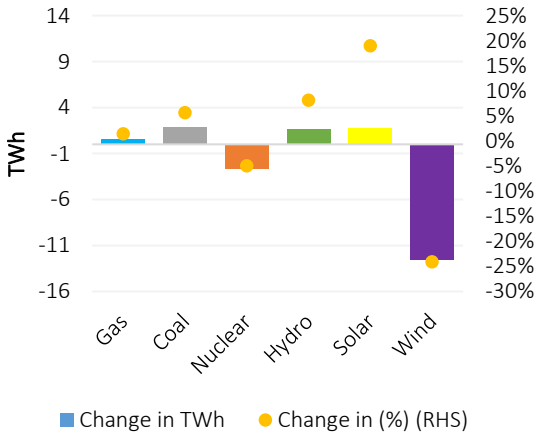
Electricity production from gas grew by 1% y-o-y, while total electricity production in the EU decreased by 4% y-o-y to reach 212 TWh. The rise in gas-fired power generation sector was driven by lower wind and nuclear output during the month by 24% and 5% y-o-y respectively as well as lower spot gas prices. Furthermore, higher generation from coal (6% y-o-y) (1.85 TWh) was recorded (Figure 7). Nuclear was the dominant fuel in the power mix with a share of 24%, followed by renewables (23%), gas (20%), coal (16%) and hydro (10%).

Figure 6: Gas consumption in the EU



Source: GECF Secretariat based on data from Entsog and McKinsey

Figure 7: Trend in electricity production in the EU in February 2023 (y-o-y change)

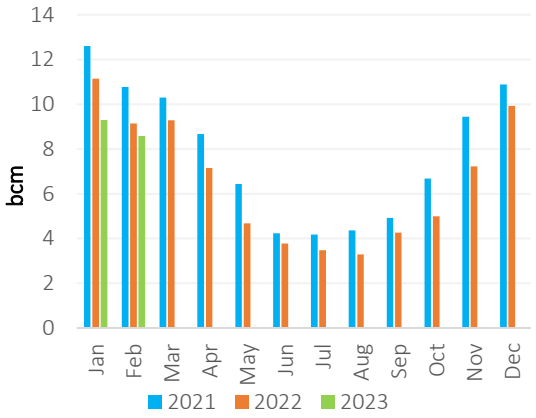


Source: GECF Secretariat based on data from Ember

2.1.1.1 Germany

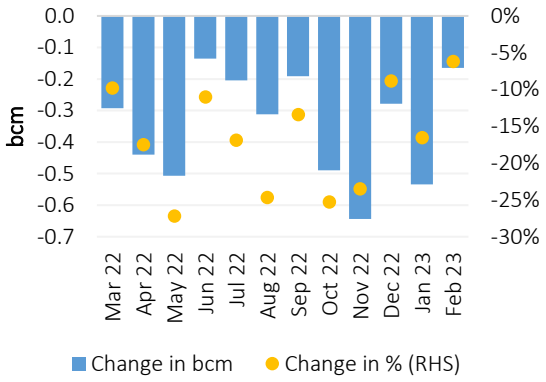
In February 2023, Germany's gas consumption decreased by 6.2% y-o-y to 8.6 bcm, driven by the strict execution of the EU policies to reduce gas consumption by 15% between August 2022 and March 2023, and above norm temperatures during the month. Despite a decline in wind output, gas consumption carries on its declining trend (Figure 8). In the industrial sector, gas consumption is still impacted by relatively high gas prices (Figure 9). For example, BASF ceased ammonia and associated fertiliser production due to high energy prices as the company incurred €3.2 billion in additional energy costs in 2022. Consumption in the residential/commercial and industrial/power generation sectors was down by 3.3% and 9.1% y-o-y, respectively.

Figure 8: Gas consumption in Germany



Source: GECF Secretariat based on data from Refinitiv

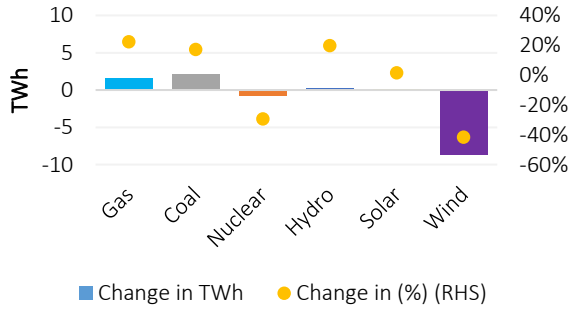
Figure 9: Trend in gas consumption in the industrial sector Mar 22 – Feb 23 (y-o-y change)



Source: GECF Secretariat based on data from

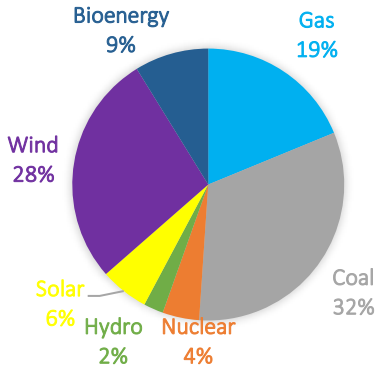
Electricity production from gas increased by 23% y-o-y, while total electricity production in Germany decreased by 10% y-o-y to reach 44 TWh. Higher generation from coal (17%), hydro (20%) and solar (2%) was recorded during the month. However, electricity production from nuclear and wind declined by 29% and 42% respectively (Figure 10). Renewables were the dominant energy source in the power mix with a share of 34% followed by coal (32%), gas (19%), nuclear (4%) and hydro (2%) (Figure 11).

Figure 10: Trend in electricity production in Germany in February 2022 (y-o-y change)



Source: GECF Secretariat based on data from Refinitiv and Ember

Figure 11: German electricity mix in February 2023



Source: GECF Secretariat based on data from Refinitiv and Ember

For the period Jan/Feb 2023, total natural gas consumption in Germany decreased by 10% y-o-y to reach 18 bcm.

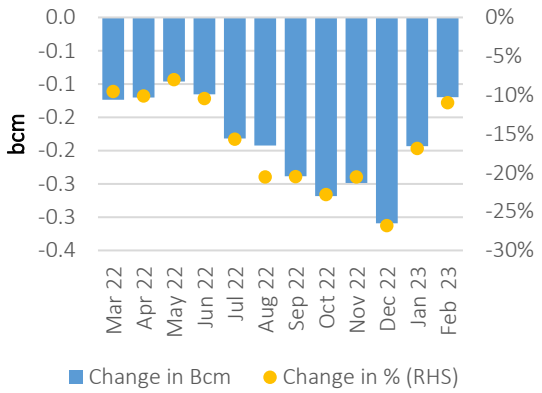
2.1.1.2 Italy

In February 2023, Italy's gas consumption decreased by 8.5% y-o-y to 7.1 bcm (Figure 12). The power generation, industrial and residential sectors were down by 18%, 3% and 11% to 1.8 bcm, 0.9 bcm and 4.1 bcm, respectively. The decline in gas consumption was driven by average temperatures being higher than the seasonal normal by 1.1°C. For the 14th month in a row, gas consumption in the industrial sector declined on a monthly basis compared to the previous year as a consequence of the high gas prices (Figure 13).

Figure 12: Gas consumption in Italy

Source: GECF Secretariat based on data from Snam

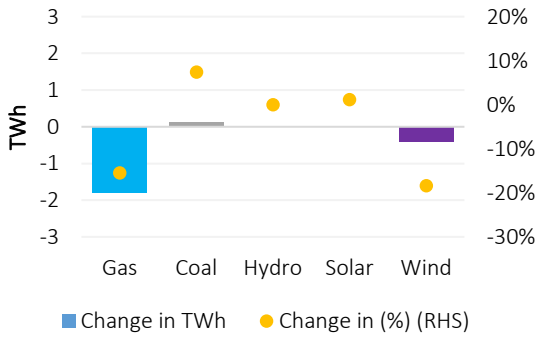
Figure 13: Trend in gas consumption in the industrial sector Mar 22 – Feb 23 (y-o-y change)



Source: GECF Secretariat based on data from Snam

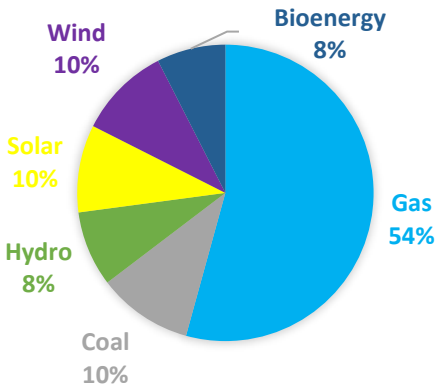
Electricity production from gas declined by 16% y-o-y, while total electricity production in Italy decreased by 10% y-o-y to reach 18 TWh. Lower generation from wind (18%) was recorded during the month. However, electricity production from coal and solar increased by 7% and 1% y-o-y (Figure 14). Gas was the dominant fuel in the power mix with a share of 54% followed by renewables (20%), coal (10%) and hydro (8%)(Figure 15). It is worth mentioning that Italy is facing a severe drought, Italy's National Research Council (CNR) said that the lack of precipitation since the commencement of 2023 was considerable compared to the yearly average. If the situation lasts into the coming weeks, Italy's hydro output in the power generation sector will shrink considerably.

Figure 14: Trend in electricity production in Italy in February 2023 (y-o-y change)



Source: GECF Secretariat based on data from Refinitiv and Ember

Figure 15: Italian electricity mix in February 2023

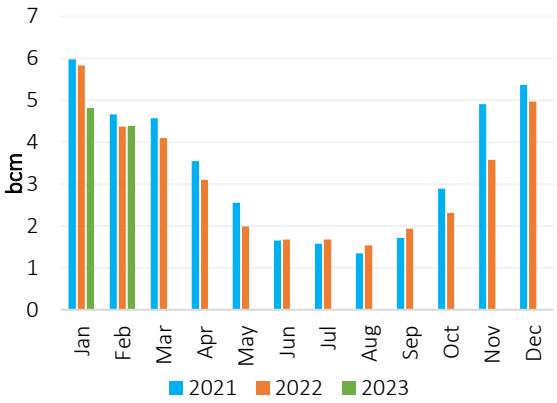


Source: GECF Secretariat based on data from Refinitiv and Ember

2.1.1.3 France

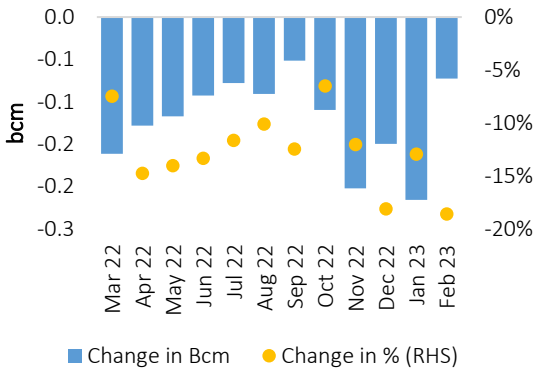
In February 2023, France's gas consumption increased by 0.3% y-o-y to reach 4.4 bcm after four consecutive months of decline (Figure 16). The rise of gas consumption was driven by higher gas use in the power generation sector, as a result of lower nuclear and wind output. The residential sector recorded a decline of 5% y-o-y as above normal temperatures were recorded during the month, which reduced the heating demand. Gas consumption in the industrial sector recorded a decline of 7.5% y-o-y (Figure 17). The drop in the industrial sector was due to high gas prices leading to a shutdown or reduction of output in some energy intensive industries, such as fertilizer and cement.

Figure 16: Gas consumption in France



Source: GECF Secretariat based on data from GRTgaz

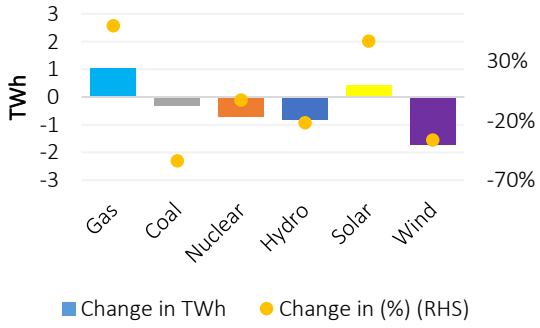
Figure 17: Trend in gas consumption in the industrial sector in France (y-o-y change)



Source: GECF Secretariat based on data from GRTgas

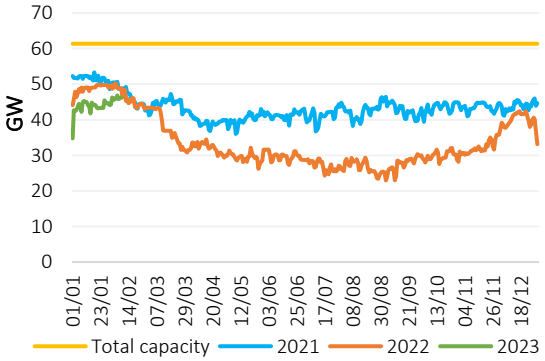
Electricity production from gas rose by 60% y-o-y, while total electricity production in France decreased by 5% y-o-y to reach 41 TWh. Higher generation from solar (+47% y-o-y) was recorded during the month. However, electricity production from nuclear, coal, hydro and wind declined by 2%, 54%, 21% and 36% y-o-y respectively (Figure 18). The nuclear capacity availability during the month declined by 6% m-o-m and 5% y-o-y (Figure 19). Nuclear remained the dominant fuel in the power mix with a share of 70% followed by gas (12%), renewables (10%) and hydro (7%).

Figure 18: Trend in electricity production in France in February 2023 (y-o-y change)



Source: GECF Secretariat based on data from Ember

Figure 19: French nuclear capacity availability



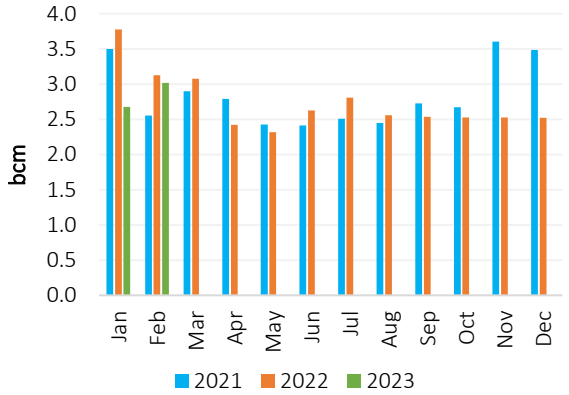
Source: GECF Secretariat based on data from Refinitiv and RTE

For the period Jan/Feb 2023, total natural gas consumption in France decreased by 10% y-o-y to reach 9.2 bcm.

2.1.1.4 Spain

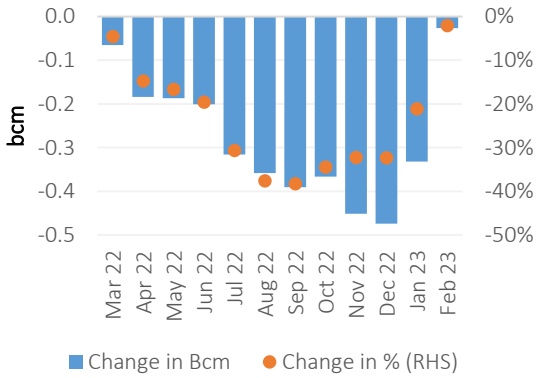
In February 2023, Spain's gas consumption decreased by 3.5% y-o-y to reach 3 bcm, driven by a decline of 3.2% and 3.8% in the industrial/residential and power generation sectors respectively, due to warmer-than-normal weather during the month, lower electricity exports to France and relatively high gas prices (Figure 20). Gas consumption in the industrial sector recorded a 12th month consecutive decline, with a decrease of 2% y-o-y. However, the decline of the industrial sector has slowed down in a context of bearish gas prices (Figure 21).

Figure 20: Gas consumption in Spain



Source: GECF Secretariat based on data from Enagas

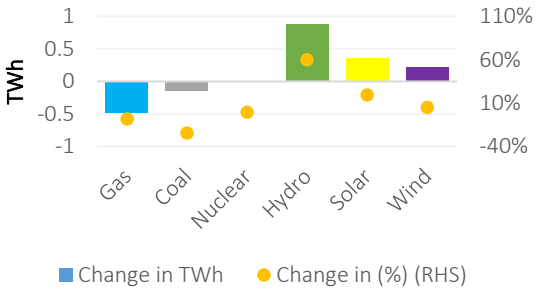
Figure 21: Trend in gas consumption in the industrial sector in Spain (y-o-y change)



Source: GECF Secretariat based on data from Enagas

Electricity production from gas declined by 8% y-o-y, while total electricity production increased by 4.3% y-o-y to reach 20 TWh. Higher generation from wind (+5% y-o-y), solar (20%) and hydro (60%) was recorded during the month and electricity production from coal declined by 25% (Figure 22). Renewables are the dominant energy source in the power mix with a share of 34% followed by nuclear (23%), gas (27%), hydro (12%) and coal (2%) (Figure 23).

Figure 22: Trend in electricity production in Spain in January 2023 (y-o-y change)



Source: GECF Secretariat based on data from Ember and Ree

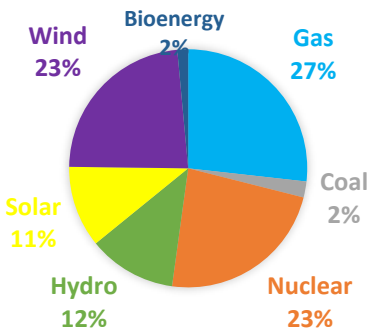


Figure 23: Spanish electricity mix February 2023

Source: GECF Secretariat based on data from Ember and Ree

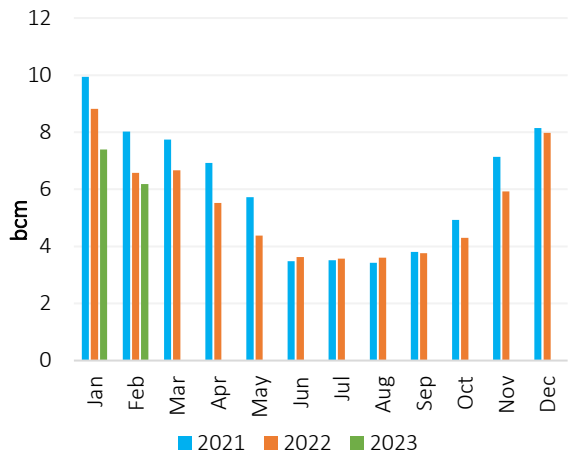
As per the forecast established by the Spanish TSO (Enagas), gas consumption in March and April 2023 are forecast to reach 2.5 bcm and 2.1 bcm which represents a decline of 18% and 13% y-o-y respectively.

For the period January and February 2023, gas consumption in Spain recorded a decline of 18% y-o-y.

2.1.2 United Kingdom

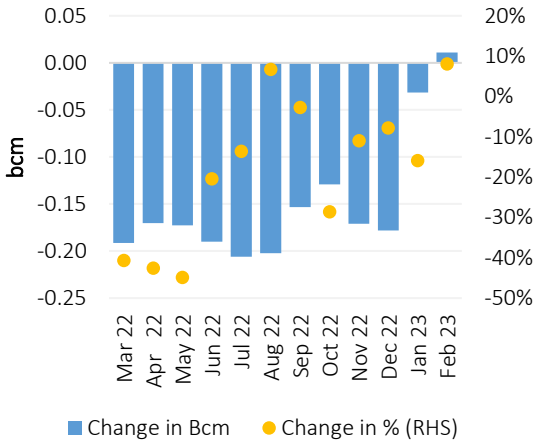
In February 2023, the UK gas consumption decreased by 6% y-o-y to reach 6.2 bcm (Figure 24), driven by mild weather that impacted the heating demand in the residential sector, which declined by 15% y-o-y to reach 4.7 bcm. In contrast, the industrial sector recorded the growth (+8% y-o-y) for the first time after more than a year of monthly declines, driven by a recovery as result of lower short-term gas prices in the UK. In addition, gas in the power generation sector increased significantly driven by some coal to gas switching and reduced wind speeds, which played in favour of gas in the power generation mix (Figure 25).

Figure 24: Gas consumption in the UK



Source: GECF Secretariat based on data from Refinitiv

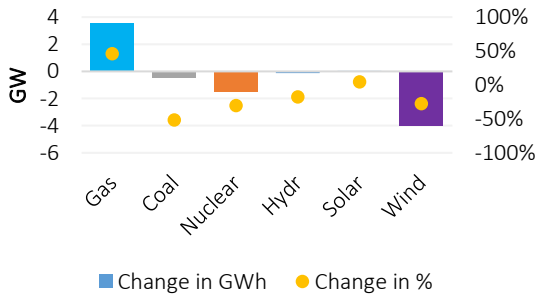
Figure 25: Trend in gas consumption in the industrial sector in the UK (y-o-y change)



Source: GECF Secretariat based on data from Refinitiv

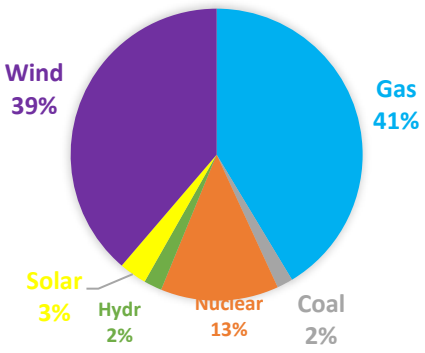
Electricity production from gas increased by 46% y-o-y, while total electricity production decreased by 9% y-o-y to reach 27 TWh. Higher generation from solar (+5% y-o-y) was recorded during the month. However, electricity production from coal, nuclear, hydro and wind declined by 51%, 30%, 18% and 27% y-o-y respectively (Figure 26). Renewables became the dominant energy source in the power mix with a share of 42% followed by gas (41%) and nuclear (13%) (Figure 27).

Figure 26: Trend in electricity production in UK in February 2023 (y-o-y change)



Source: GECF Secretariat based on data from Refinitiv

Figure 27: Spanish electricity mix February 2023



Source: GECF Secretariat based on data from Refinitiv

For the period January and February 2023, gas consumption in the UK declined by 1.8 bcm, or 12% y-o-y.

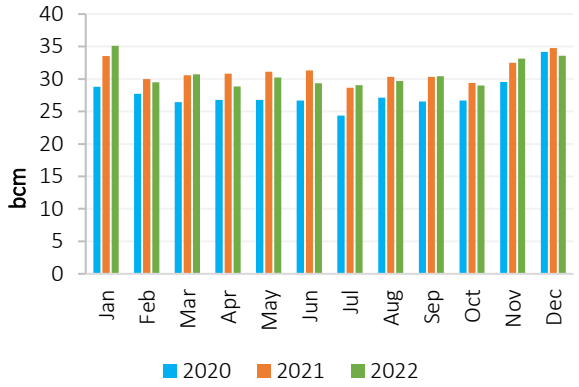
2.2 Asia

2.2.1 China

In December 2022, apparent Chinese gas demand (pipeline imports + LNG imports + national production) decreased by 3.3% y-o-y to 34 bcm, despite the easing of COVID-19 lockdown measures and cold weather during the month (Figure 28).

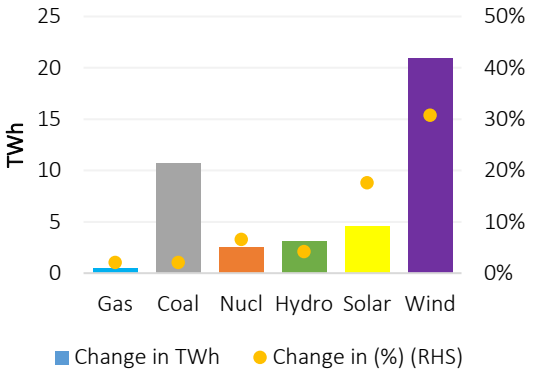
Electricity production from gas rose by 2% y-o-y, while total electricity production increased by 6% y-o-y to reach 791 TWh. Higher generation from coal (2%), nuclear (7%), hydro (4%), solar (18%) and wind (31%) was recorded during the month (Figure 29). Coal remained the dominant fuel in the power mix with a share of 66% followed by renewables (15%), hydro (9%), nuclear (5%) and gas (3%).

Figure 28: Gas consumption in China



Source: GECF Secretariat based on data from Refinitiv

Figure 29: Trend in electricity production in China in in December 2022 (y-o-y change)

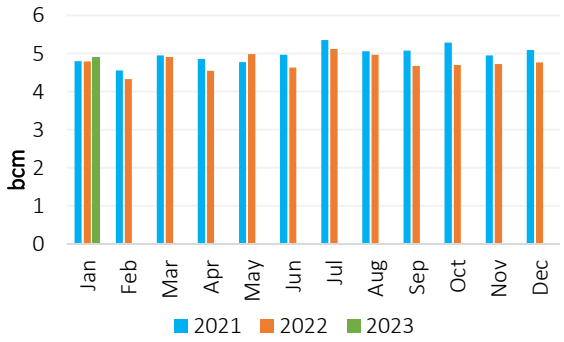


Source: GECF Secretariat based on data from Ember

2.2.2 India

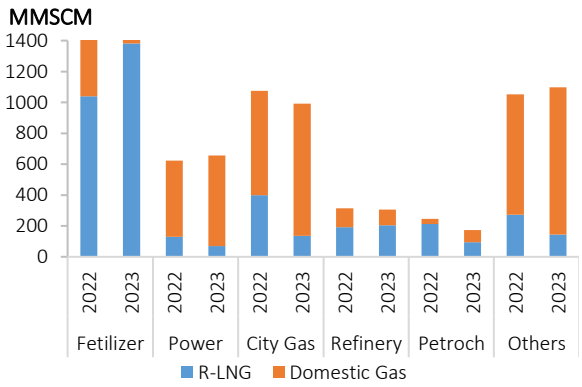
In January 2023, India's gas consumption increased by 2.2% y-o-y to reach 4.9 bcm (Figure 30). The share of regasified LNG in India's gas supply dropped to 41%. In terms of the share of gas consumption by sector, the fertilizer sector maintained its dominant share of 34%, followed by city gas, power generation, refining and petrochemical sectors with the shares of 20%, 13%, 6% and 3.5%, respectively (Figure 31).

Figure 30: Gas consumption in India



Source: GECF Secretariat based on data from India's PPAC

Figure 31: India's gas consumption by sector

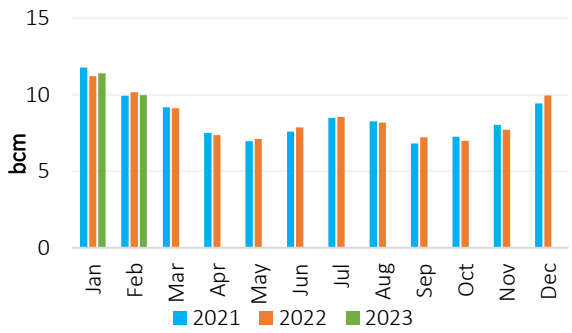


Source: GECF Secretariat based on data from India's PPAC

2.2.3 Japan

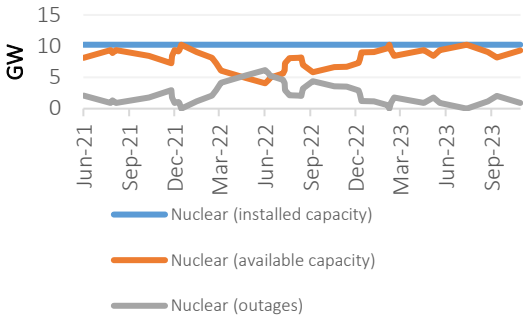
In February 2023, gas consumption in Japan declined by 1.9% y-o-y to reach 10 bcm (Figure 32) which was driven by mild weather that muted the gas consumption in the city gas sector by 1.4% y-o-y. Natural gas in the Power generation declined by 2.3% y-o-y driven by higher coal and nuclear output in the power mix. Nuclear availability during the month was higher by 18% compared to the same period of last year. Japan's Heating Degree Days (HDD) during the month averaged 9.6, down by 15% y-o-y (Figure 33).

Figure 32: Gas consumption in Japan



Source: GECF Secretariat based on data from Refinitiv

Figure 33: Nuclear availability in Japan

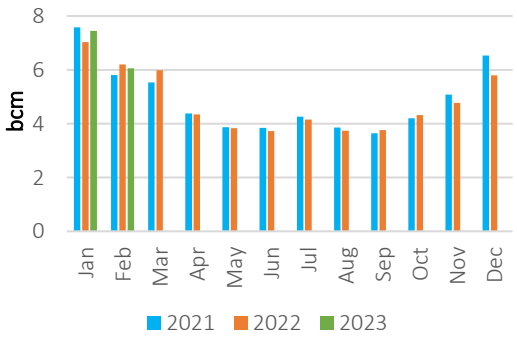


Source: GECF Secretariat based on data from Refinitiv

2.2.4 South Korea

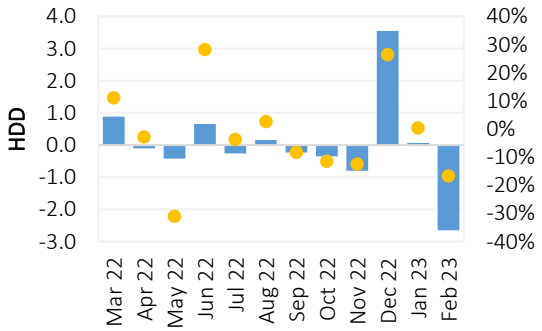
In February 2023, gas consumption in South Korea declined by 2% y-o-y to 6.1 bcm, driven mainly by lower gas utilization in the residential sector as above norm temperatures were recorded during the month. The residential sector alone declined by 9.2% y-o-y to 4 bcm. However, gas consumption in the power generation mix increased by 4.1% y-o-y due to lower nuclear and coal based output during the month (Figure 34). South Korea's nuclear power availability has declined drastically by 17 GW in February 2023 compared to the same period of last year, representing a decline of 70% of the total Korean nuclear capacity, due to the delay to restart the reactors by Korea Hydro and Nuclear Power (KHNP) company. According to KHNP, only 17 out of 25 reactors were running during the month. Korea's HDD during the month averaged 13, down by 17% y-o-y, which strongly affects the gas consumption in the country (Figure 35).

Figure 34: Gas consumption in South Korea



Source: GECF Secretariat based on data from Refinitiv

Figure 35: HDD in South Korea (y-o-y change)



Source: GECF Secretariat based on data from Refinitiv

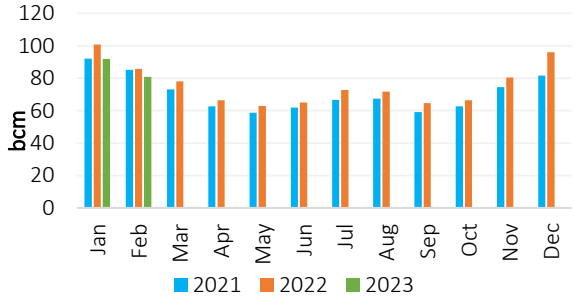
2.3 North America

2.3.1 US

In February 2023, gas consumption in the U.S. is estimated to have declined by 5.9% y-o-y to 81 bcm (Figure 36). The residential, industrial and commercial sectors were the main drivers of the decline with a decrease of 21% (4.8 bcm), 5% (1 bcm) and 10% (1.4 bcm) y-o-y respectively. The drop is due to warmer temperatures in the majority of the regions during the month versus 2022 and a slowdown in the industrial activity.

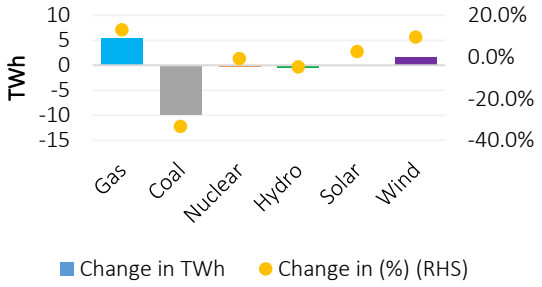
Electricity production from gas rose by 13% y-o-y, while total electricity production decreased by 3.4%. Higher y-o-y generation from wind (10%) and solar (3%) was offset by a decline in generation from coal, nuclear and hydro by 33%, 1% and 5% respectively (Figure 37). Gas remained the dominant fuel in the power mix with a share of 38% followed by nuclear (20%), renewable (17%), coal (16%) and hydro (7%).

Figure 36: Gas consumption in the US



Source: GECF Secretariat based on data from EIA and Refinitiv

Figure 37: Electricity production in the US in February 2023 (y-o-y change)

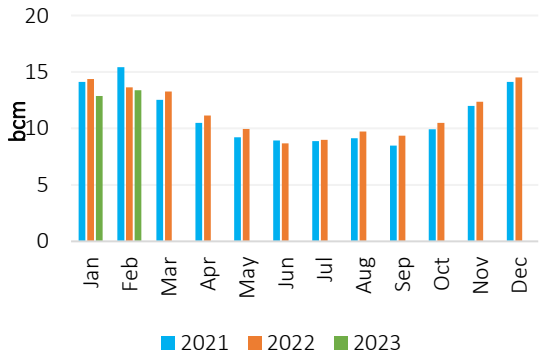


Source: GECF Secretariat based on data from Ember and Refinitiv

2.3.2 Canada

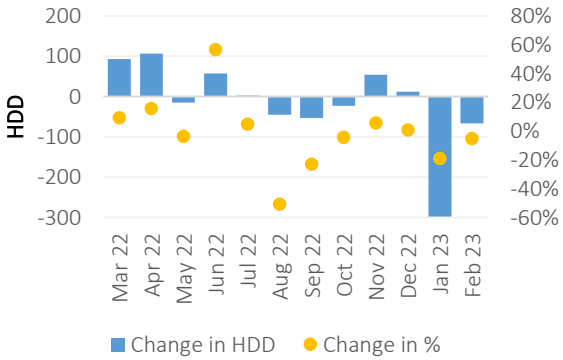
In February 2023, Canada's gas consumption declined by 2% y-o-y, driven by a fall in the industrial/power generation and commercial sectors by 2.4% and 17% y-o-y respectively (Figure 38). By contrast, the residential sector recorded a growth of 7.4% y-o-y driven by colder than last year during the month. February 2023 was colder on average across Canada compared to February 2022, with HDD averaging 1227, up by 5% y-o-y (Figure 39).

Figure 38: Gas consumption in Canada



Source: GECF Secretariat based on data from Refinitiv

Figure 39: HDD in Canada (y-o-y change)



Source: GECF Secretariat based on data from Refinitiv

2.4 Weather Forecast

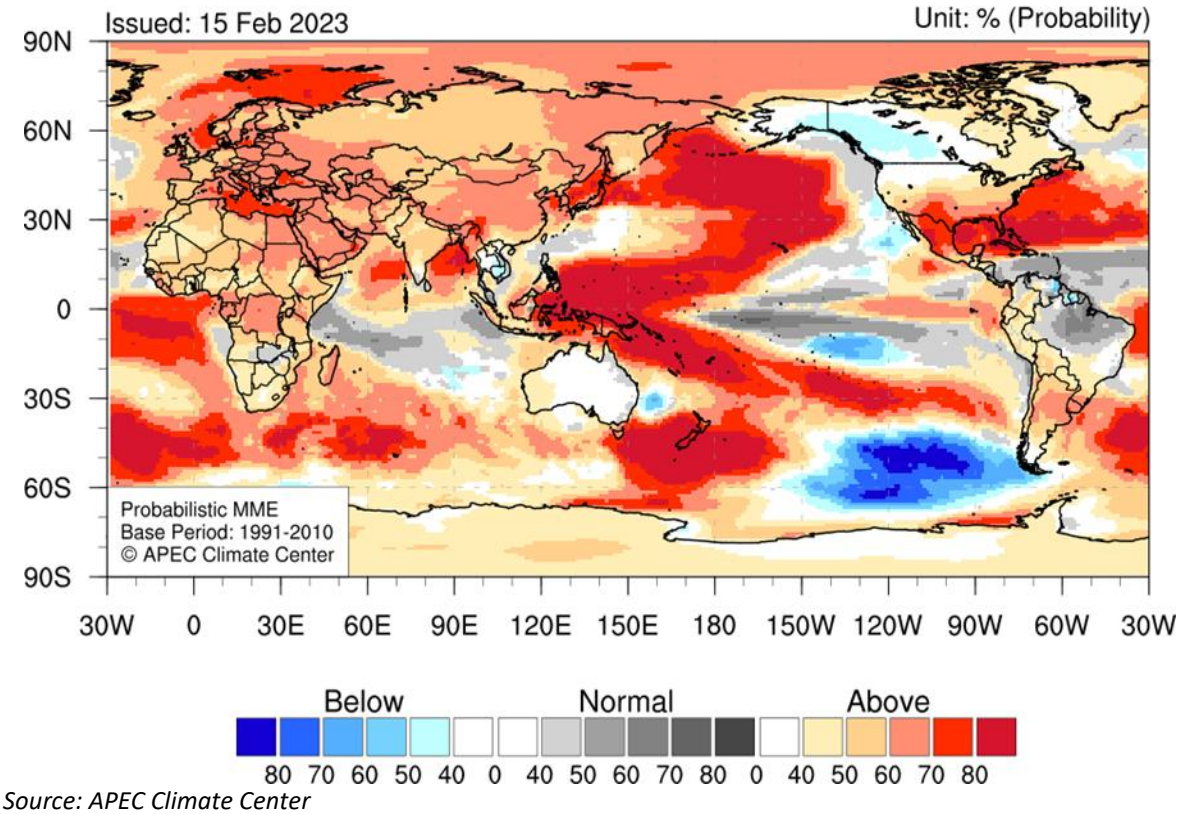
Weather and precipitation conditions have significant impact on gas consumption. Below normal temperatures in winter and above normal temperatures in summer boost heating and cooling demand respectively, while below normal precipitation leads to lower hydro output, which may trigger higher gas demand in the power generation sector.

2.4.1 Temperature Forecast for March to May 2023

According to the APEC Climate Center climate outlook published on February 15, 2023 (Figure 40), the weather for the period March to May 2023 is forecast as follows:

- Above normal temperatures are expected for most of the globe (excluding central and eastern tropical regions and the southern South Pacific),
- Below normal temperatures are expected for the southern South Pacific region,
- Near normal temperatures are predicted for the central equatorial Pacific, some regions of the western and eastern Indian Ocean, off-equatorial North Atlantic and northern Brazil.

Figure 40: Temperature forecast March to May 2023



Source: APEC Climate Center

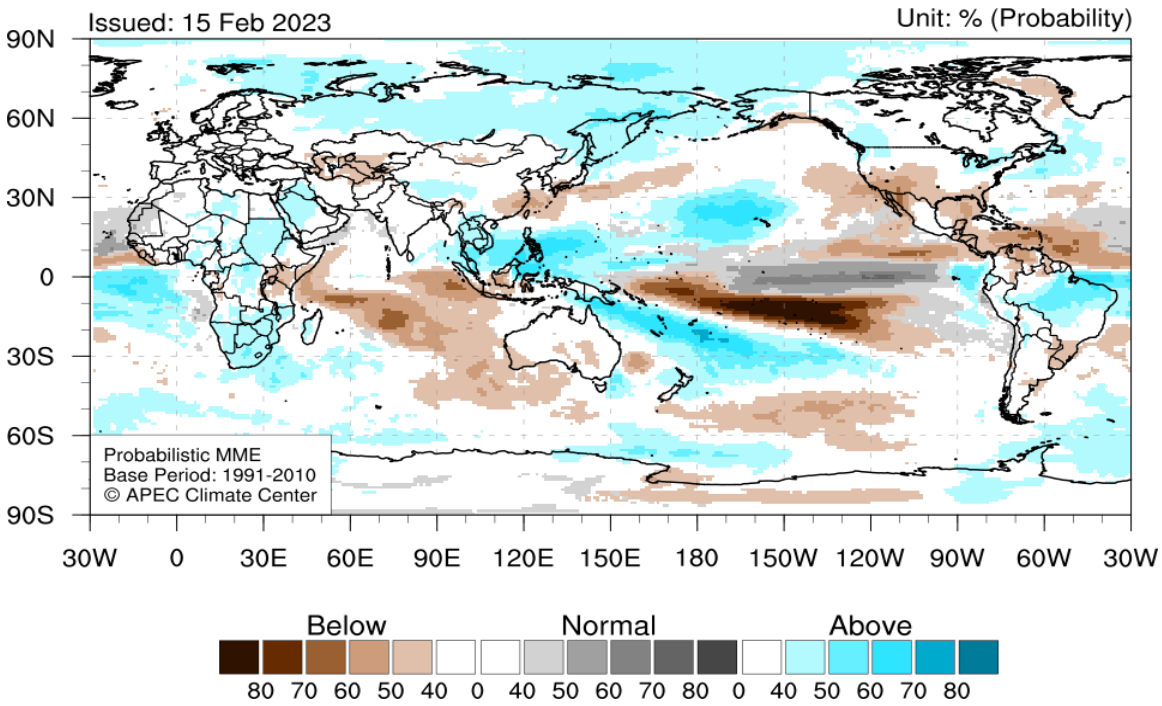
2.4.2 Precipitation Forecast for March to May 2023

According to the APEC Climate Center climate outlook published on January 16, 2023 (Figure 41), the precipitation prediction for the period March to May 2023 is as follows:

- Above normal precipitation is expected for the southern region of the western subtropical Pacific, South China Sea, Philippine Sea, Philippines, northern regions of central tropical and subtropical Pacific, equatorial Atlantic, northern Brazil and some regions of central and southern Africa.

- Near normal precipitation is predicted for the central and eastern equatorial Pacific.
- Below normal precipitation is expected for the eastern and western Indian Ocean, the Caribbean Sea and the central off-equatorial South Pacific.

Figure 41: Precipitation forecast March to May 2023



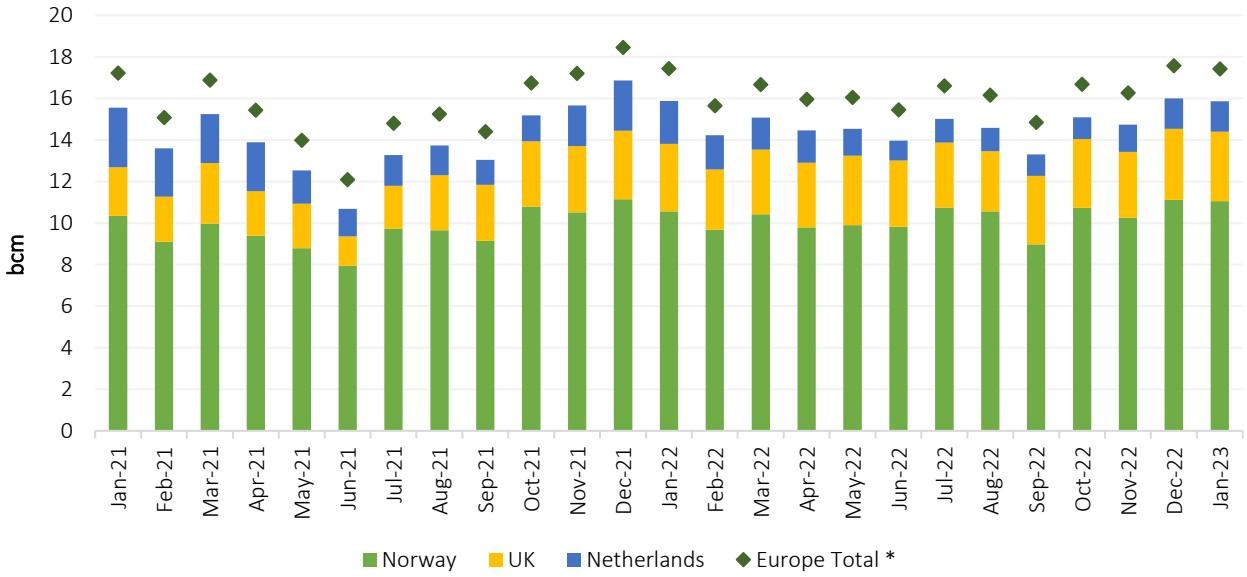
Source: APEC Climate Centre

3 Gas Production

3.1 Europe

In January 2023, Europe's gas production remained unchanged at 17.4 bcm compared to last year's January production. However, gas production declined by 1% m-o-m mainly due to a drop in output by Norway. Norway's production stood at 11.1 bcm, recording a 1% m-o-m decrease, which was primarily caused by an unplanned outage at the Kollsnes gas processing plant. Norway's annual gas production in 2023 is anticipated to remain steady at approximately 129 bcm, similar to the levels observed in 2022. The UK's and Netherlands' production stood at 3.3 bcm and 1.5 bcm, respectively (Figure 42).

Figure 42: Europe's monthly gas production



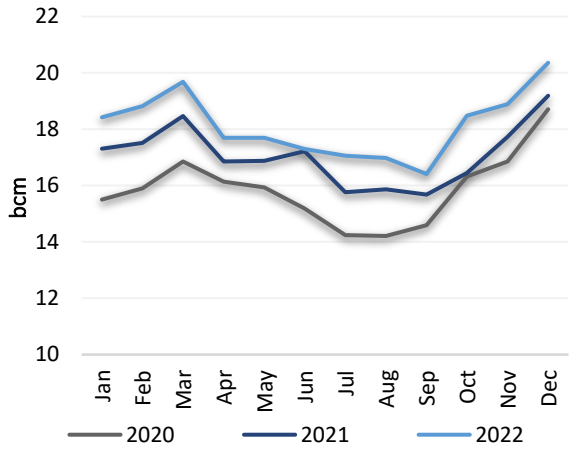
Source: GECF Secretariat based on data from Refinitiv, JODI Gas, Norwegian Petroleum Directorate
*Europe's production: UK, Netherlands, Norway, Germany, Italy, Poland, Denmark, Austria, and Romania

3.2 Asia

China's annual gas production increased by 4% y-o-y to reach 212.5 bcm in 2022. In addition, the country's gas production showed an increase of 6% y-o-y in December 2022, recording an all-time high (Figure 43). Due to the delay in data publication by the National Bureau of Statistics of China, gas production figures for January and February 2023 will be included in the next issue of the Monthly Gas Market Report.

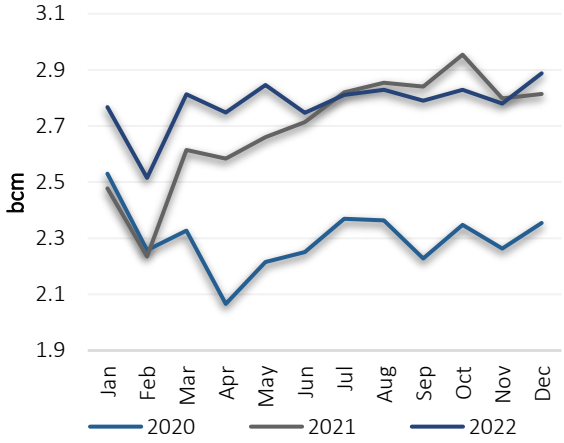
Gas output from another major producer in the region, India, increased by 5% y-o-y and 1% m-o-m to stand at 2.9 bcm in December 2022 (Figure 44). India's annual gas production in 2022 stood at 33.4 bcm, 3% higher y-o-y.

Figure 43: Trend in gas production in China



Sources: GECF Secretariat based on data from the National Bureau of Statistics of China

Figure 44: Trend in gas production in India



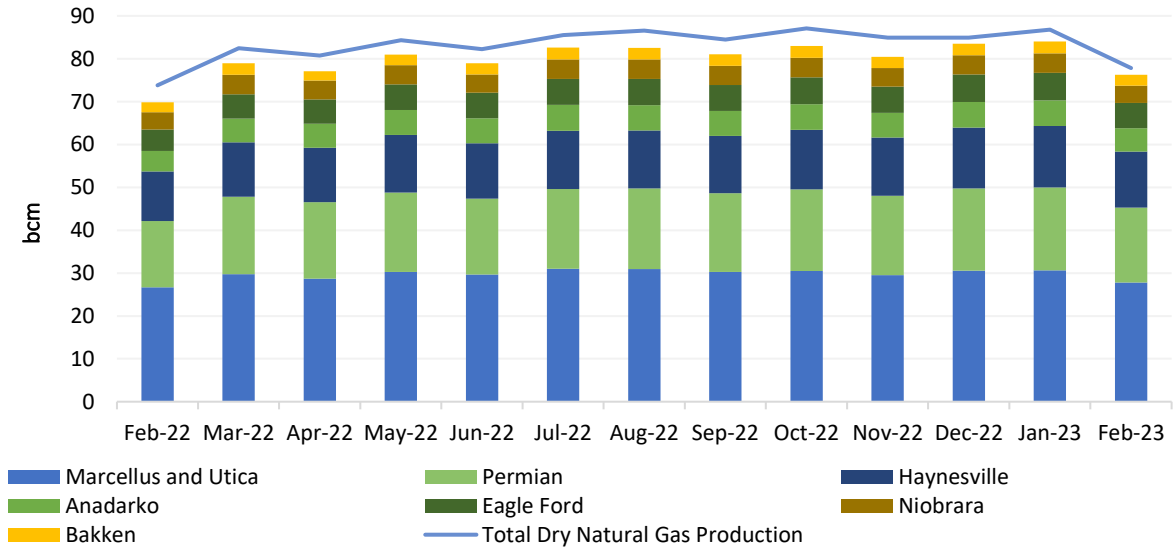
Sources: GECF Secretariat based on data from Refinitiv, Ministry of Petroleum (India)

3.3 North America

Shale gas production from seven key shale gas/oil regions (Anadarko, Appalachian, Bakken, Eagle Ford, Haynesville, Niobrara and Permian) increased by 9% y-o-y (6.4 bcm) to reach 76.2 bcm in February 2023 (Figure 45). The Appalachian region, comprising the Marcellus and Utica shale plays, remains the primary shale gas-producing region, accounting for 36% of the total shale gas output. In addition, the Permian shale oil field have witnessed a significant increase in associated gas production, which surged by 13% y-o-y to reach 17.5 bcm, representing 23% of the total shale gas production.

According to EIA, in the first nine months of 2022, gas production from horizontal wells in the United States experienced growth compared to the same period in 2021. This increase was significant, and as a result, these wells contributed to 78% of all gas production in the country.

Figure 45: Trend in total gas production and shale gas production in the US shale oil/gas producing regions



Source: GECF Secretariat based on data from Refinitiv, EIA

3.4 Upstream Activity Tracker

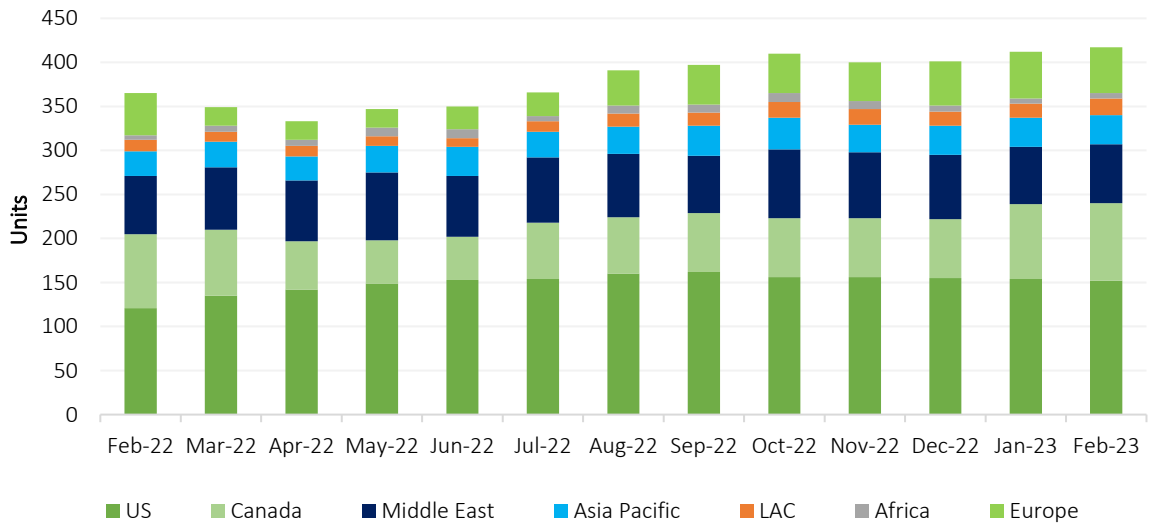
The global gas rig count, as an indicator of upstream activity, increased by 5 units in February 2023 compared to the previous month and by 52 units compared to the same period last year, bringing the total to 417 units (Figure 46). Canada, LAC and the Middle East witnessed an uptick in active gas rig count by 3, 3 and 2 units, respectively. However, other regions' gas rig count declined or stayed at the same level.

In January 2023, the total number of oil and gas rigs in the 7 major shale oil and gas producing regions in the US was 693, representing a 1-unit decrease from December 2022 and a 153-unit increase from January 2022 (Figure 47). The increase in the number of active rigs in 2022 is attributed to the surge in gas prices and the heightened feedstock demand for LNG export facilities. This has prompted oil and gas firms to ramp up their upstream operations to produce more gas.

The number of drilled but uncompleted (DUCs) wells in the 7 key US shale oil and gas producing regions of the US increased by 42 compared to the previous month to stand at 4,671 in January 2023 (Figure 48). This is 413 wells below the number of DUCs in January 2022. Drillers are being incentivized to operationalize previously drilled wells (DUCs), due to the surging costs associated with drilling new wells.

The EIA's Drilling Productivity Report shows that in 7 major shale oil and gas producing regions, gas production per rig declined by 0.6% m-o-m and 14% y-o-y, reaching 5400 thousand cubic feet per new well (Figure 49).

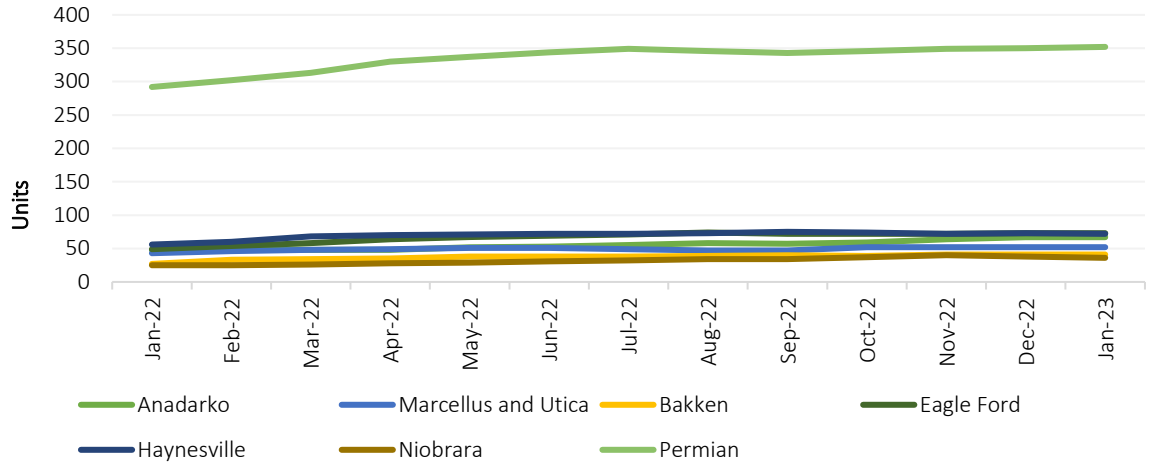
Figure 46: Trend in monthly global gas rig count*



* *Excludes data for CIS and Iran*

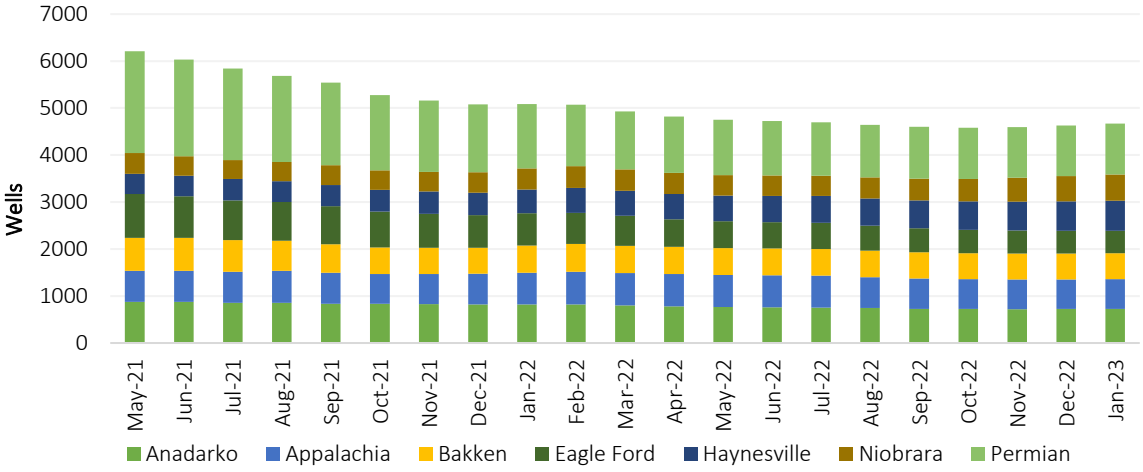
Source: GECF Secretariat based on data from Baker Hughes

Figure 47: US shale region oil and gas rig count



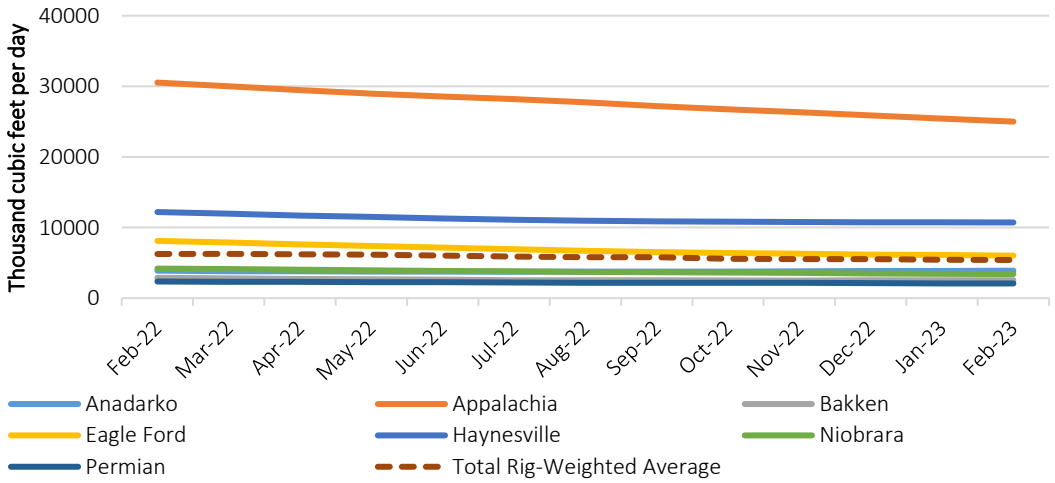
Source: GECF Secretariat based on data from Refinitiv

Figure 48: Drilled but uncompleted well (DUCs) counts in the US



Source: GECF Secretariat based on data from Refinitiv, US EIA

Figure 49: New-well gas production per rig



Source: GECF Secretariat based on data from Refinitiv, US EIA

3.5 Discoveries

Gas and liquids volumes discovered in January 2023 totalled 381 million barrels of oil equivalent (boe), of which 43% (28 bcm) is gas, while the remaining 57% (218 million boe) is oil. This compares to 1027 million boe of discovered volumes in December 2022 and 1041 million boe of discovered volumes in January 2022 (Figure 50).

In total, 9 new discoveries occurred in January 2023, of which 3 were offshore discoveries and 6 onshore discoveries. The major discovered gas volumes were in LAC and Europe with 79% and 18% of the discovered volumes respectively, with no major discoveries in CIS, North America and Middle East (Figure 51).

In terms of key discoveries in January 2023, Guyana's Fangtooth offshore oil discovery, drilled in the Stabroek Block, stood as the most significant discovery of the month. The discovery well (Fangtooth SE-1), located approximately 8 miles southeast of the original Fangtooth-1 discovery, encountered 60m of net oil-bearing sandstone reservoir. The discovery now adds to the block's discovered gross recoverable resources estimated at more than 11 billion boe and has the potential to underpin a future oil development. It is worth mentioning that Guyana is the home of the world's largest oil discoveries in the last 10 years.

In the North Sea, the new gas discoveries in the mature basins off the coast of Norway and UK revived the hopes for finding additional volumes that can be developed using the existing infrastructure with minimum cost and low emissions. The Norwegian Obelix Upflank new offshore gas discovery stood as the most significant realization for that hope. The new find, located 23 kilometres south of the Irpa gas discovery and also close to the Aasta Hansteen field, is believed to contain between 2 and 11 bcm of recoverable gas resources.

In the same context, the UK first licensing round for exploration since 2020 attracted 115 bids from 76 companies. This bid round targets boosting UK's domestic energy production and securing its long-term energy supply. The UK had temporarily paused licensing rounds in 2020 to ensure its licensing policy was in line with the country's net-zero goals.

Figure 50: Monthly gas and liquids discovered volumes

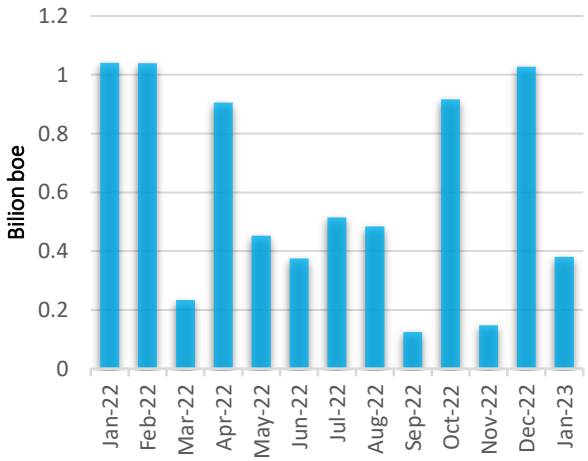
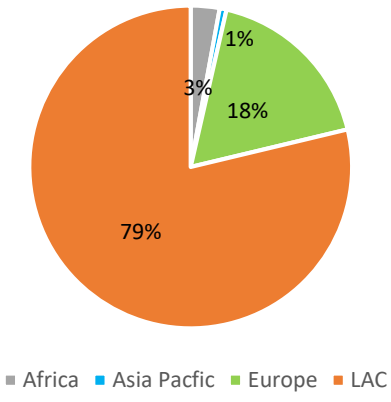


Figure 51: Discovered volumes in January 2023 by regions



Source: GECF Secretariat based on Rystad Energy Cube

3.6 Other Developments

Based on preliminary estimations, global annual gas production decreased by 0.1% to 4047 bcm in 2022, attributed to reduced production in the CIS and Africa. A combination of factors, such as lower demand due to high prices and geopolitical tensions, has negatively impacted gas production (Table 1). However, gas output in North America, the Middle East, Asia Pacific, Europe and LAC regions experienced an increase of 59, 20, 3, 3 and 2 bcm, respectively. The 2022 global gas figures have been slightly revised up compared to the previous month's estimations due to the upward revisions to the CIS, the Middle East and Asia Pacific's gas output.

In 2023, the forecasts reveal a growth of 1.5% in global gas production, driven by production growth in North America, Latin America, the Middle East and Africa. Non-GECF gas output is estimated to increase by 3.2% to reach 2467 bcm, mainly due to a production increase of 51 bcm in the US.

Table 1: Global gas production forecast by region (bcm)

Region	2021	2022	2022 Revision*	2023	2023 Revision*
Africa	270	259	-0.2%	264	-0.6%
Asia Pacific	668	671	0.2%	664	-0.9%
CIS	898	817	2.5%	795	1.4%
LAC	152	154	0.0%	161	3.6%
Europe	224	227	-1.7%	219	-2.0%
Middle East	673	693	0.5%	716	0.3%
North America	1165	1224	-0.5%	1290	-0.7%
World	4052	4047	0.37%	4109	-0.1%
GECF	1751	1656	0.8%	1642	0.0%
non-GECF	2300	2390	0.1%	2467	-0.1%

Source: GECF Secretariat based on Rystad Energy Ucube
**Revision for 2022 and 2023 global gas production compared to the previous estimation*

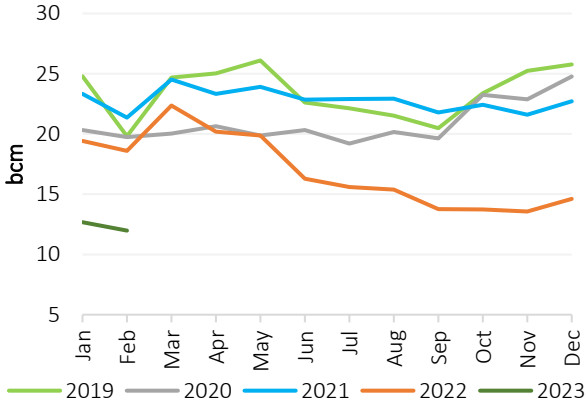
4 Gas Trade

4.1 Pipeline Gas (PNG) Trade

4.1.1 Europe

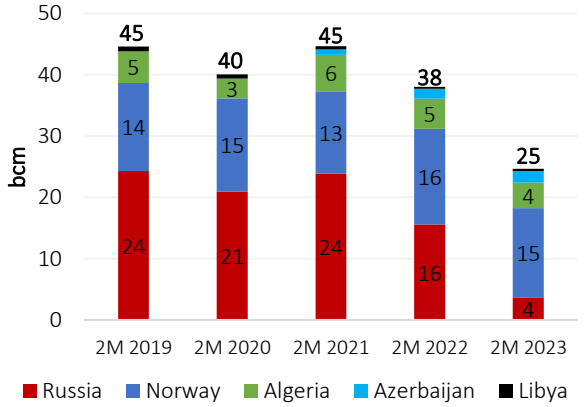
In February 2023, there was 12.0 bcm of PNG imports to the EU, which was 5% lower than the previous month, and 36% lower than one year ago (Figure 52). During the first two months of 2023, total extra-EU pipeline gas imports for the two months combined, decreased by 35% y-o-y to 24.7 bcm (Figure 53). This was driven by supply decreases from Russia, Norway and Algeria, while there was a rise in imports from both Azerbaijan and Libya. The pipeline import by supplier and month in 2023 is shown in Figure 54.

Figure 52: Monthly PNG imports to the EU



Source: GECF Secretariat based on data from McKinsey and Refinitiv

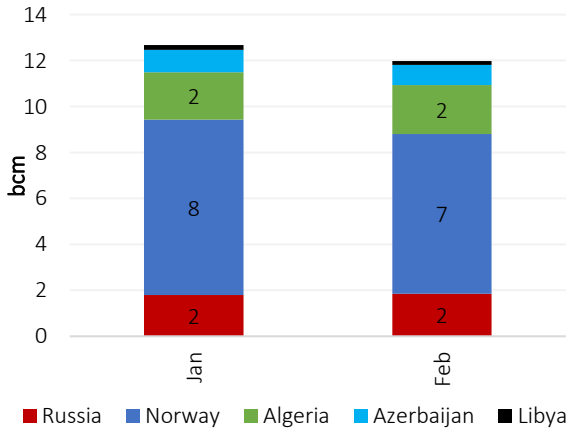
Figure 53: Year-to-date EU PNG imports by supplier



Source: GECF Secretariat based on data from McKinsey and Refinitiv

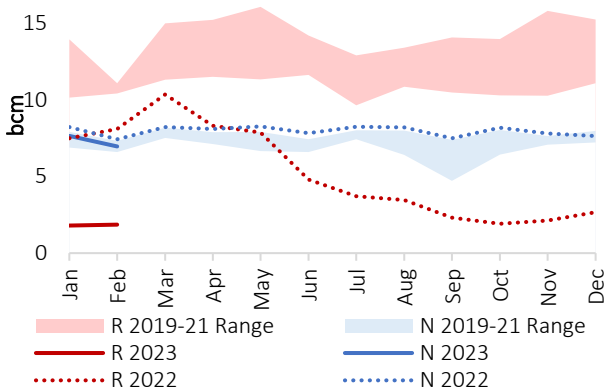
In 2023 thus far, Norwegian supply has declined by 7% y-o-y to reach 15 bcm, while imports from Russia decreased by 77% y-o-y to reach 3.6 bcm. During 2023, Norway thus far has accounted for 59% of total supply to the EU, compared with Russia at 15%. Norway's PNG exports to the EU average 7.3 bcm per month in 2023, compared with 7.9 bcm per month in 2022, and 7.3 bcm per month during 2019-2021 (Figure 55). Flows from Norway to the EU slightly reduced in 2023 due to upstream maintenance activity, and increased exports to the UK. In comparison, Russia's PNG exports to the EU average 1.8 bcm per month in 2023, compared with 5.2 bcm per month in 2022, and 12.5 bcm per month from 2019-2021.

Figure 54: Monthly EU PNG imports by supplier



Source: GECF Secretariat based on data from McKinsey and Refinitiv

Figure 55: EU PNG supply from Russia and Norway

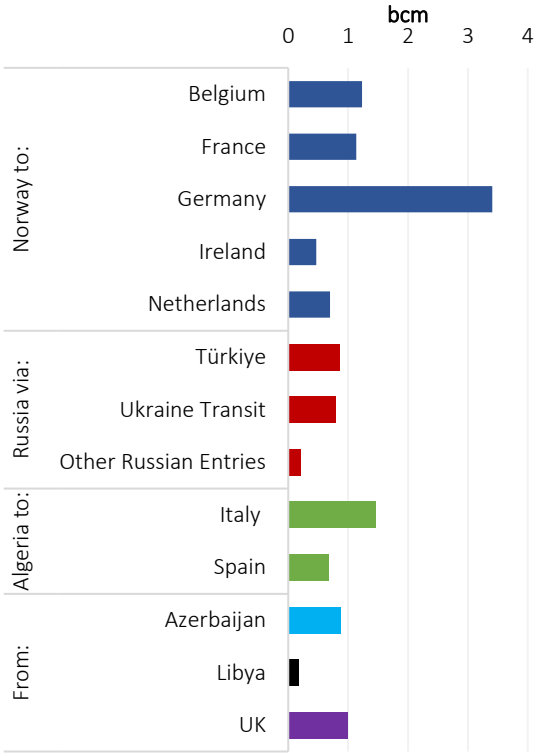


Source: GECF Secretariat based on data from McKinsey and Refinitiv

Looking more closely at EU PNG trade on a more granular level, Figure 56 shows the flows to the region via the major import supply routes in February 2023. Norway exported most of its volumes (48%) to Germany, but some of these volumes are expected to be redistributed towards Poland via the Baltic Pipe. For Russia, the main supply routes were the Turkstream pipeline (46%) and the Ukraine transit pipelines (42%). The Italian market accounted for 69% of Algerian PNG exports. With the continued influx of LNG imports to the UK, 1.0 bcm of PNG entered the EU via the interconnectors in February.

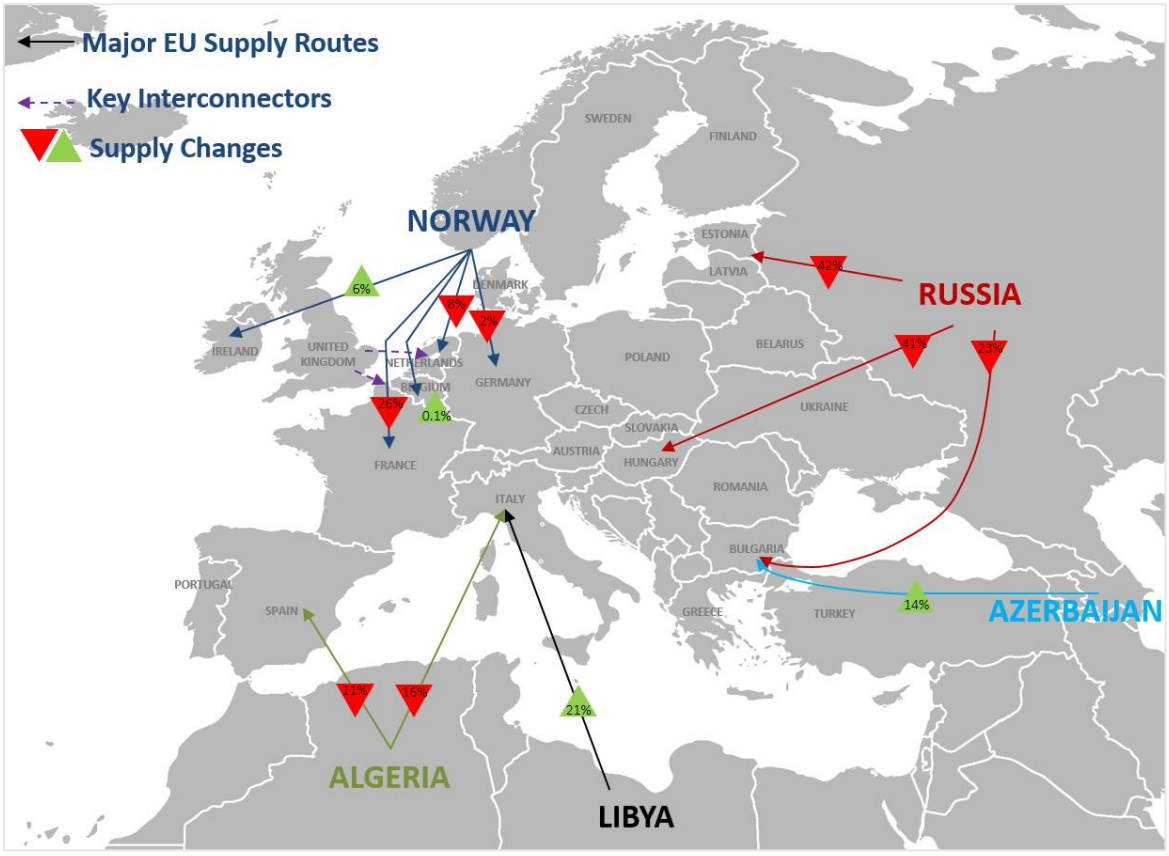
Figure 57 shows the EU PNG imports via the major supply routes in the first two months of 2023 versus the same period in the previous year. Russian PNG flows have observed declines through all routes. Quantities from Norway to France recorded a decrease of 0.8 bcm or 26%.

Figure 56: EU PNG imports by supply route in February 2023



Source: GECF Secretariat based on data from McKinsey and Refinitiv

Figure 57: PNG imports to the EU by supply route (2M 2023 v 2M 2022)

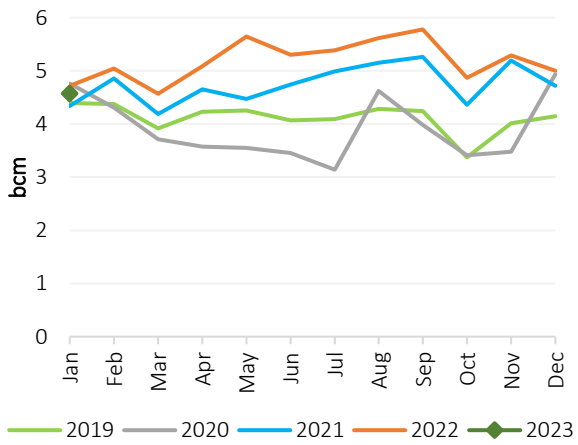


Source: GECF Secretariat based on data from McKinsey and Refinitiv

4.1.2 Asia

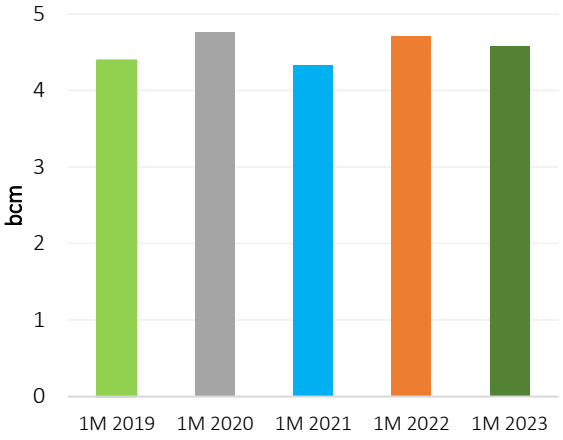
In January 2023, PNG imports to China was estimated at 4.6 bcm, which was 9% lower m-o-m, and 3% lower y-o-y (Figure 58). China's PNG imports in the coming months will be influenced by the gas demand as the country emerges from lockdowns. The average monthly PNG imports in 2022 was 5.2 bcm, compared with 4.7 bcm during the same period in 2021, which is an increase of 9% (Figure 59).

Figure 58: Historical PNG imports in China



Source: GECF Secretariat based on data from Refinitiv

Figure 59: Monthly PNG imports in China



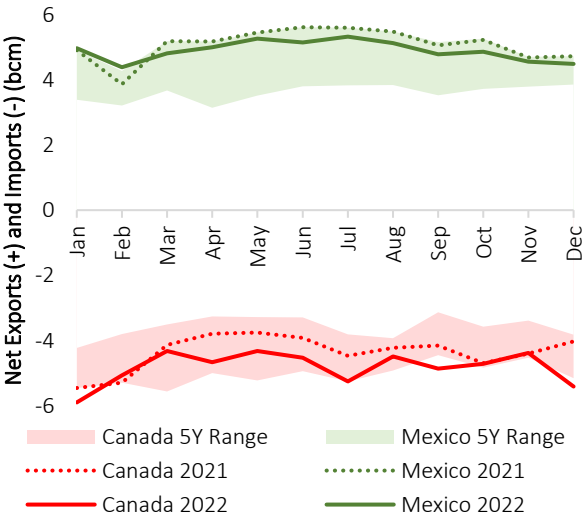
Source: GECF Secretariat based on data from Refinitiv

4.1.3 North America

In December 2022, net PNG imports from Canada to the US reached 5.4 bcm, which was 24% higher m-o-m and 34% higher y-o-y (Figure 60). Net PNG exports from the US to Mexico reached 4.5 bcm, which was 2% lower m-o-m and 5% lower y-o-y.

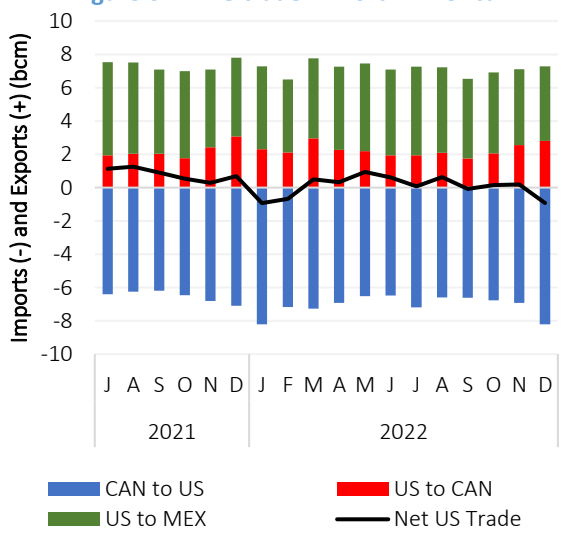
These PNG flows resulted in a small quantity of net pipeline imports into the US from Canada (Figure 61). During 2022, average monthly flows in the region were: CAN to US – 7.1 bcm, US to CAN – 2.2 bcm, and US to MEX – 4.9 bcm.

Figure 60: Historical net PNG trade in the USA



Source: GECF Secretariat based on data from US EIA

Figure 61: PNG trade in North America



Source: GECF Secretariat based on data from US EIA

4.1.4 Other Developments

Increased pipeline gas supply from Azerbaijan to Romania: Azerbaijan's state oil company, SOCAR, has penned an agreement with the Romanian gas company, Romgaz, for a new gas supply contract. The term of the agreement will run from April 1, 2023 to March 31, 2024 and will facilitate the delivery of up to 1 bcm of gas supply in total over that period.

Kazakhstan to curb gas exports to China: Kazakhstan's state-owned firm QazaqGaz has announced that it will stop all exports to China prior to the winter of 2023/24. This measure is being taken to ensure that the domestic Kazakh gas demand is met during the winter period, in light of declining gas supply. Kazakhstan may even engage in gas imports from Russia to avoid shortfalls during the period.

New proposed supply route from Russia to China: Russia's Gazprom and Kazakhstan's QazaqGaz are in talks over a proposed new supply route for Russian pipeline gas exports to China, via Kazakhstan. The advantages of this project would be the opportunity for Russia to redirect physical gas flow that would have supplied Europe towards the Asian market, while at the same time facilitating the growing gas demand in the Kazakh market.

New intra-Europe gas link: European countries continue in their efforts to increase the regional gas interconnectivity. In this regard, Croatian authorities have announced the Southern Gas Interconnection project, which will include a 180 km pipeline from Croatia to Bosnia and Herzegovina. The 5 bcma pipeline will bring gas supply from Croatia's Krk LNG terminal. The project is expected to cost 100 million euros, and will be operational in 2025.

4.2 LNG Trade

4.2.1 LNG Imports

In February 2023, global LNG jumped by 7.5% (2.40 Mt) y-o-y to 34.24 Mt (Figure 62), reversing the y-o-y decline recorded in January 2023. This is a record high for global LNG imports in February. Stronger LNG imports in Asia Pacific and Europe drove the increase in global LNG imports and offset weaker imports in LAC and MENA (Figure 63). For January and February 2023 combined, global LNG imports grew by 2.8% (1.9 Mt) driven by higher LNG imports in Europe and Asia Pacific which offset declines in all other regions.

Figure 62: Trend in global monthly LNG imports

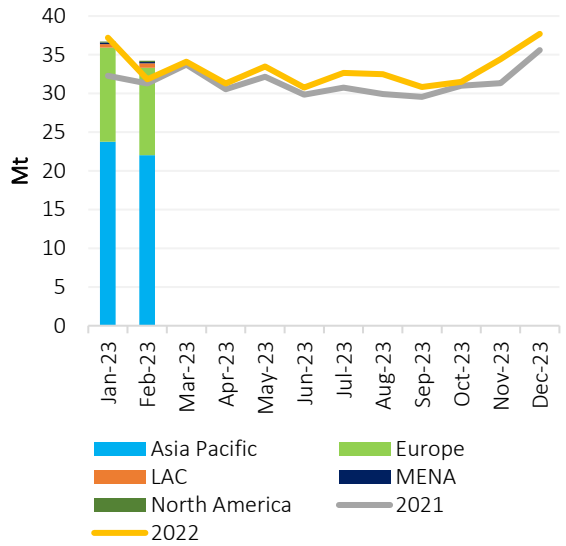
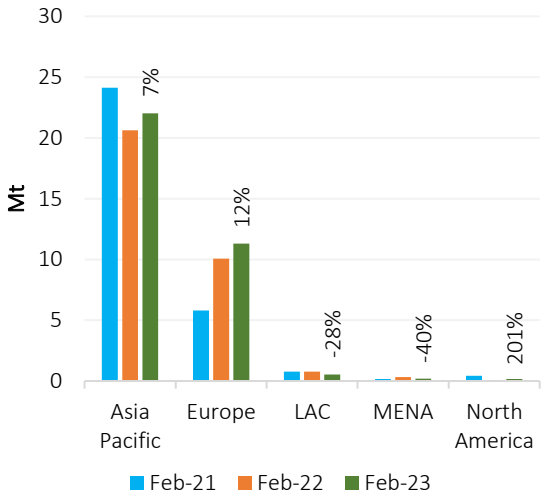


Figure 63: Trend in regional LNG imports in February 2023



Source: GECF Secretariat based on data from ICIS LNG Edge

4.2.1.1 Europe

In February 2023, Europe's LNG imports continued to expand y-o-y and rose by 12.2% (1.23 Mt) to 11.30 Mt (Figure 64). Lower pipeline gas imports from Russia into Europe drove LNG imports into the region. Belgium, France, Germany, Italy, the Netherlands and Poland accounted for the bulk incremental increase in European LNG imports, which offset a drop in Spanish LNG imports (Figure 65). For January and February 2023 combined, European LNG imports increased by 8.8% (1.89 Mt) y-o-y to 23.45 Mt.

The jump in LNG imports in Belgium was supported by stronger demand for pipeline gas exports to Germany to compensate for lower imports of Russian pipeline gas. In France, the decline in imports of Russian pipeline gas combined with higher demand for pipeline gas exports to Switzerland supported the uptick in LNG imports in the country. It should also be noted that Belgium imports LNG via the Dunkirk LNG facility in France, which contributed to the higher LNG imports in France. Meanwhile, the higher LNG imports in Germany and Poland was attributed to the weaker pipeline gas imports from Russia into both countries. In Italy, lower pipeline gas imports from Algeria and Russia drove the rise in LNG imports in the country. Furthermore, weaker domestic gas production, coupled with a decrease in pipeline gas imports from Norway and Russia and an increase in demand for pipeline gas exports to Germany boosted LNG imports in the Netherlands. In contrast, despite stronger gas consumption in Spain, higher LNG inventory compared to a year earlier curbed LNG imports into the country.

Figure 64: Trend in Europe's monthly LNG imports

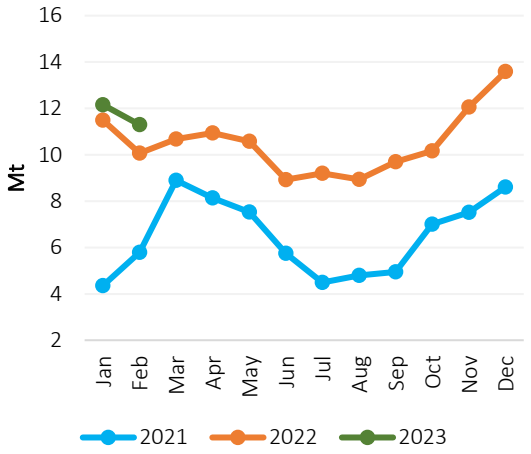
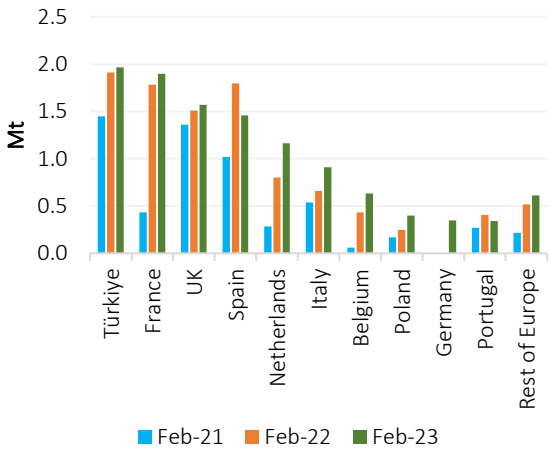


Figure 65: Top LNG importers in Europe



Source: GECF Secretariat based on data from ICIS LNG Edge

4.2.1.2 Asia

In February 2023, Asia Pacific's LNG imports grew by 6.8% (1.40 Mt) y-o-y to 22.03 Mt (Figure 66). The incremental LNG imports were the highest since October 2021. The higher regional LNG imports came mainly into China, Malaysia, Singapore and South Korea, which was offset by lower imports in India and Japan (Figure 67). For January and February 2023 combined, Asia Pacific's LNG imports moved slightly higher by 2.0% (0.90 Mt) y-o-y to 45.79 Mt.

In China, the easing of the Zero-COVID policy has finally supported the recovery in economic and industrial activity, which led to an increase in LNG imports in the country. Looking at Malaysia, weaker gas availability from domestic production on the mainland boosted LNG imports. Meanwhile, the higher LNG imports in Singapore was attributed to a decline in pipeline gas imports. In South Korea, despite the easing of coal restrictions in the electricity sector during the winter season, lower nuclear availability supported the surge in LNG imports into the country. On the other hand, the loss of supply under the Gazprom-Gail LNG SPA, which Germany's Sefe took over the contract from Gazprom, led to the decline in India's LNG imports. Finally, mild winter weather and high LNG stocks curbed Japan's LNG imports.

Figure 66: Trend in Asia's monthly LNG imports

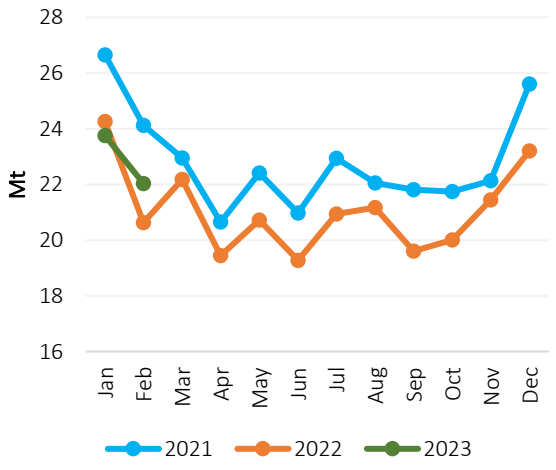
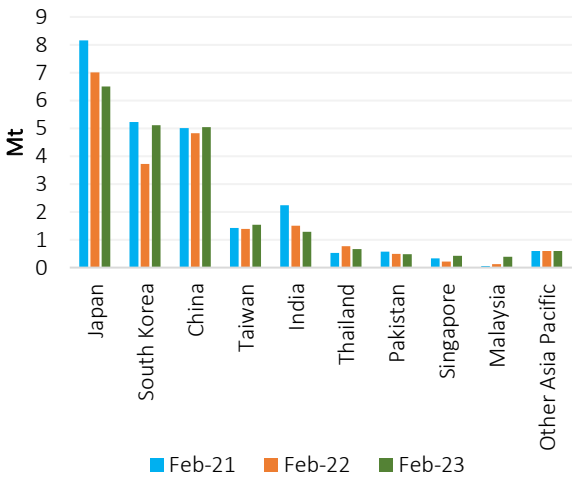


Figure 67: Top LNG importers in Asia



Source: GECF Secretariat based on data from ICIS LNG Edge

4.2.1.3 Latin America & the Caribbean (LAC)

In February 2023, LAC's LNG imports fell by 28% (0.22 Mt) y-o-y to 0.55 Mt (Figure 68). This decline in LNG imports was driven mainly by weaker LNG imports in Brazil, which offset higher LNG imports in Colombia (Figure 69). From January to February 2023, LAC's LNG imports slumped by 39% (0.67 Mt) y-o-y to 1.03 Mt.

Similar to the previous month, Brazil did not import any LNG cargoes in February 2023 as a result of stronger hydro levels in the country. In contrast, Colombia issued a tender for a LNG cargo in early February and the cargo was delivered on February 21, 2023 from Trinidad and Tobago.

Figure 68: Trend in LAC's monthly LNG imports

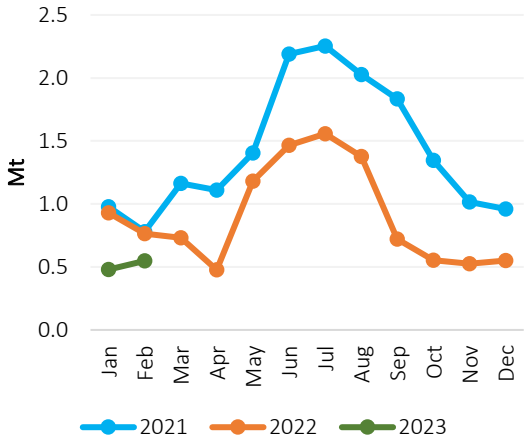
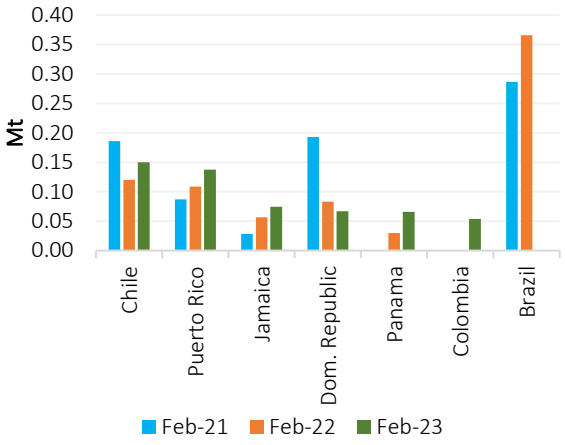


Figure 69: Top LNG importers in LAC



Source: GECF Secretariat based on data from ICIS LNG Edge

4.2.1.4 MENA

In February 2023, MENA region's LNG imports continued to slide and slumped by 40% (0.13 Mt) y-o-y to 0.19 Mt (Figure 70). Kuwait drove the recent decline in LNG imports in the region (Figure 71). For January and February 2023 combined, the MENA region's LNG imports fell by 30% (0.16 Mt) y-o-y to 0.37 Mt.

The drop in LNG imports in Kuwait was due to stronger supply of low sulphur fuel oil (LSFO) to electricity plants, which may have curbed gas demand for electricity generation.

Figure 70: Trend in MENA's monthly LNG imports

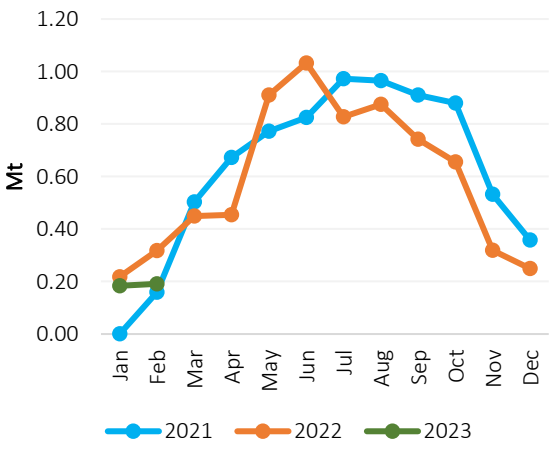
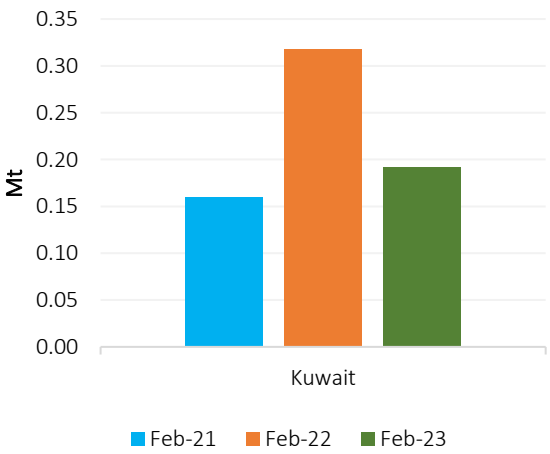


Figure 71: Top LNG importers in MENA



Source: GECF Secretariat based on data from ICIS LNG Edge

4.2.2 LNG Exports

In February 2023, global LNG exports rose sharply y-o-y by 11% (3.48 Mt) to 34.00 Mt (Figure 72). Stronger LNG exports from GECF member countries, non-GECF countries and higher LNG reloads drove the growth in global LNG exports. Non-GECF countries were the largest LNG exporters during the month with a share of 49.5% in global LNG exports, followed by GECF (48.4%) and LNG reloads (2.1%). In comparison to February 2022, the shares of GECF member countries and LNG reloads increased from 48.2% and 0.8% respectively while the share of non-GECF countries declined from 51.0%. At a country level, the US was the largest exporter in February 2023, followed by Australia and Qatar (Figure 73). For January and February 2023 combined, global LNG exports rose by 6.7% (4.33 Mt) y-o-y to 69.44 Mt.

Figure 72: Trend in global monthly LNG exports

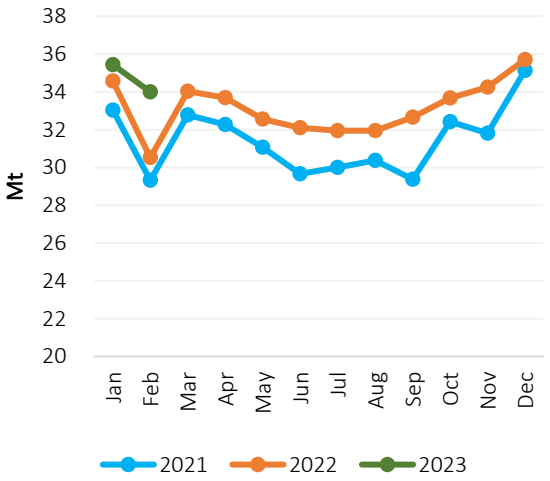
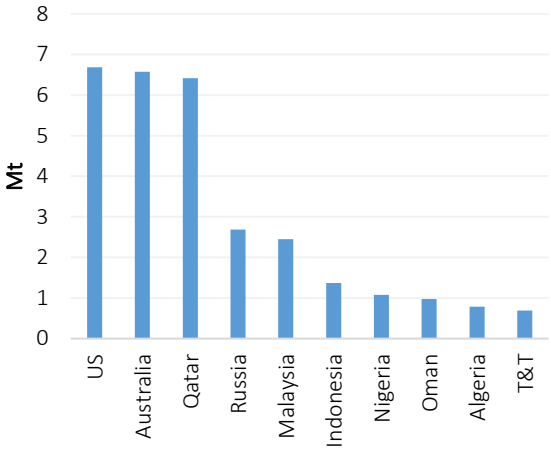


Figure 73: Top 10 LNG exporters in Feb 2023



Source: GECF Secretariat based on data from ICIS LNG Edge

4.2.2.1 GECF

In February 2023, GECF's LNG exports (Members and Observers) jumped by 12% (1.74 Mt) y-o-y to 16.45 Mt (Figure 74). The surge in GECF's LNG exports was driven by Qatar (+0.84 Mt), Norway (+0.36 Mt), Malaysia (+0.33 Mt), Egypt (+0.15 Mt), Mozambique (+0.15 Mt), Angola (+0.14 Mt), Algeria (+0.10 Mt), Trinidad and Tobago (+0.08 Mt), Russia (+0.05 Mt) and Peru (+0.02 Mt). In contrast, LNG exports declined in the United Arab Emirates (-0.26 Mt) and Nigeria (-0.21 Mt) as shown in Figure 75. For January and February 2023 combined, GECF's LNG exports grew by 5.6% (1.79 Mt) y-o-y to 34.10 Mt.

Looking at Qatar and Angola, lower maintenance activity at LNG facilities in both countries compared to a year earlier boosted the countries' LNG exports. In Norway, the continued ramp-up in production from the Hammerfest LNG facility, following its restart in June 2022, drove the increase in LNG exports. Furthermore, higher feedgas availability for LNG exports in Malaysia, Egypt, Algeria and Trinidad and Tobago supported the increase in exports from these countries. With regards to Mozambique, the ramp-up in production from the Coral South FLNG facility supported the rise in LNG exports.

On the other hand, the decline in LNG exports from the United Arab Emirates was attributed to maintenance activity at the Das Island LNG facility. In Nigeria, lower feedgas availability for LNG exports contributed to the lower LNG exports. NLNG declared force majeure on feedgas supply to the liquefaction facility in January 2023, which remained in effect in February 2023.

Figure 74: Trend in GECF monthly LNG exports

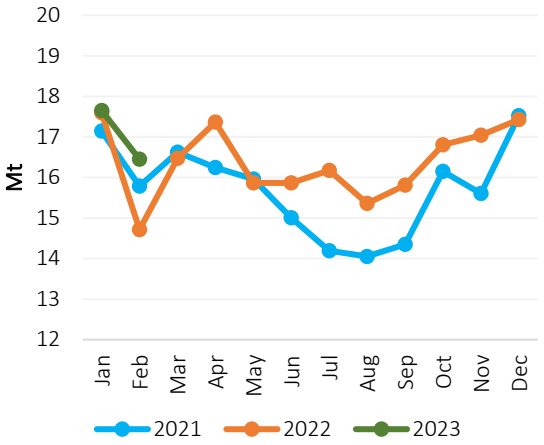
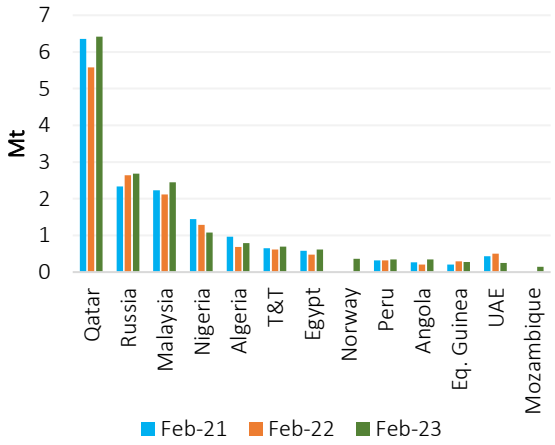


Figure 75: GECF's LNG exports by country



Source: GECF Secretariat based on data from ICIS LNG Edge

4.2.2.2 Non-GECF

In February 2023, non-GECF's LNG exports increased by 8.2% (1.27 Mt) y-o-y to 16.83 Mt (Figure 76). The stronger LNG exports came mainly from Indonesia (+0.47 Mt), the US (+0.43 Mt), Australia (+0.29 Mt), Cameroon (+0.05 Mt), Oman (+0.02 Mt) and Brunei (+0.01 Mt) as shown in Figure 77. For January and February 2023 combined, non-GECF's LNG exports grew by 6.2% (1.99 Mt) y-o-y to 34.11 Mt.

The jump in Indonesia's LNG exports was boosted by lower maintenance activity at the Tangguh LNG facility compared to a year earlier. In the US, the ramp-up in production from the Calcasieu Pass LNG and Sabine Pass LNG Train 6 facilities as well as lower maintenance activity at the Sabine Pass LNG facility drove the increase in the country's LNG exports. It should be noted that Freeport Trains 2 and 3 restarted operations in February 2023 following an explosion in June 2022, however, exports from the facility are yet to reach full capacity. Meanwhile, the uptick in Australia's LNG exports was supported by stronger LNG exports from the APLNG, GLNG, North West Shelf and Prelude LNG facilities, which was offset by lower exports from Darwin and QCLNG facilities. The higher LNG exports from Prelude was due to lower maintenance activity compared to a year earlier while the rate decline in the Darwin and QCLNG facilities was attributed to lower feedgas and higher maintenance respectively.

Figure 76: Trend in non-GECF monthly LNG exports

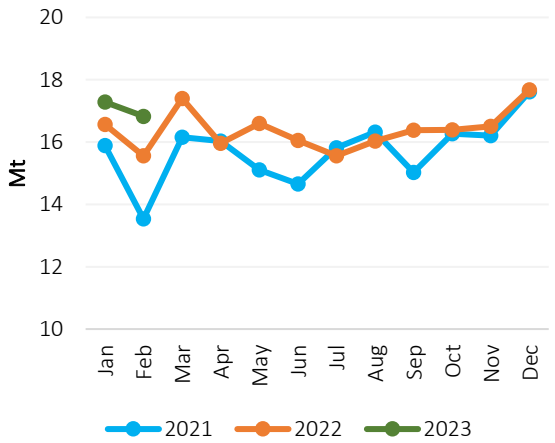
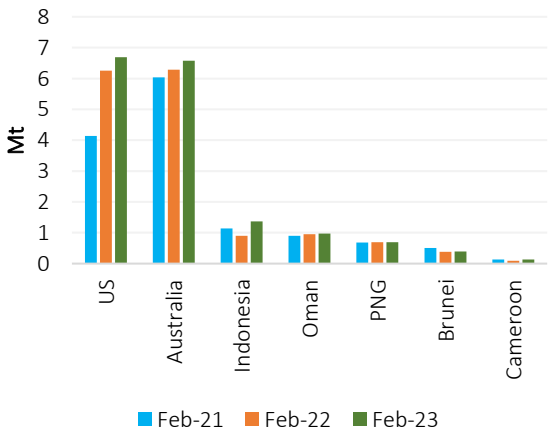


Figure 77: Non-GECF's LNG exports by country



Source: GECF Secretariat based on data from ICIS LNG Edge

4.2.3 Global LNG Reloads

In February 2023, global LNG reloads surged by 187% (0.47 Mt) y-o-y to 0.72 Mt (Figure 78), which is the highest level since July 2018. The higher LNG reloads were driven mainly by Malaysia (+0.15 Mt), China (+0.14 Mt), Indonesia (+0.09 Mt), France (+0.07 Mt), Belgium (+0.06 Mt) and Jamaica (+0.02 Mt), which was offset by lower reloads from the Netherlands (-0.06 Mt) as shown in Figure 79. For January and February 2023 combined, global LNG reloads rose sharply by 82% (0.55 Mt) y-o-y to 1.22 Mt.

The stronger LNG reloading activity from Malaysia and Indonesia was supported by third-party access to the Pengerang and Arun LNG regasification facilities in both countries respectively, for LNG storage and reloading activities to other Asian markets. Meanwhile, the jump in LNG reloads from China was attributed to weak LNG demand in the country, which supported LNG reloads and exports to Japan, South Korea and Thailand.

Figure 78: Trend in global monthly LNG reloads

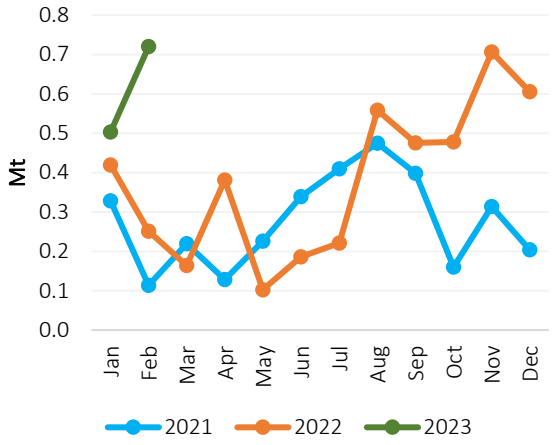
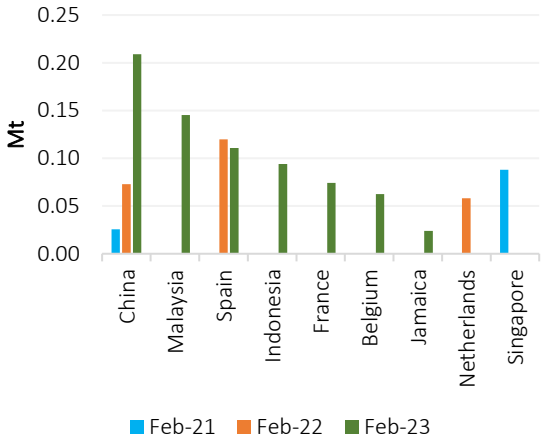


Figure 79: Global LNG reloads by country



Source: GECF Secretariat based on data from ICIS LNG Edge

4.2.4 Arbitrage Opportunity

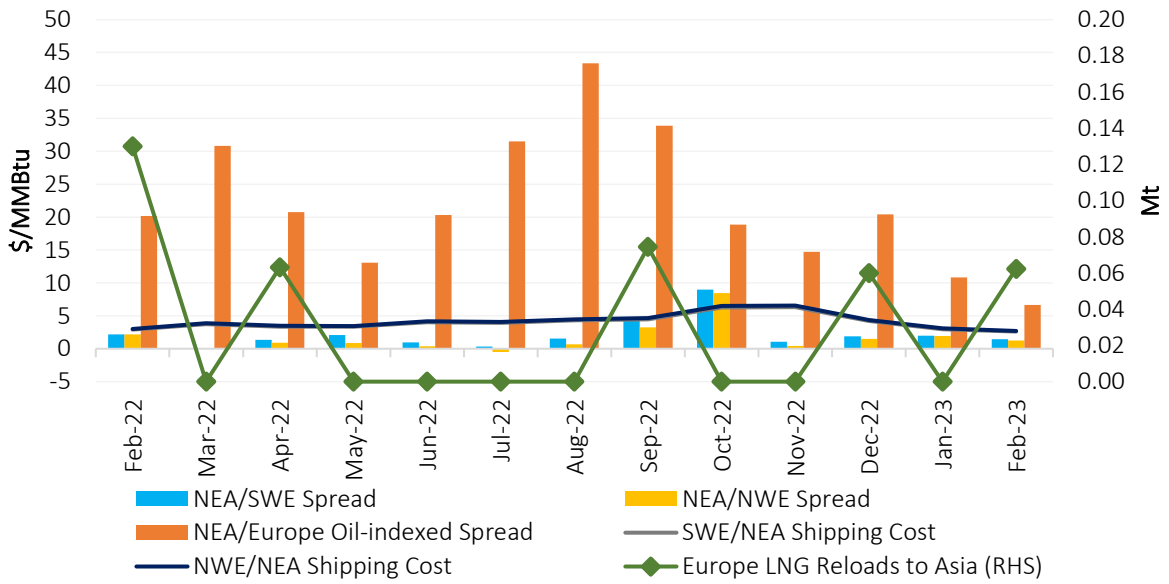
In February 2023, the arbitrage opportunity for LNG reloads from Europe to Asia Pacific, based on the spot LNG price differential between both markets, continued to be out-the-money. This was due to the narrowing of the spot LNG price differentials between Asia Pacific and Europe, which were lower than the spot shipping cost from Europe to Asia Pacific (Figure 80). However, the arbitrage opportunity based on the spot LNG price in Asia and oil-indexed price in Europe was in-the-money. The NEA/SWE and NEA/NWE price spreads fell by 27% ($0.53/MMBtu) and 36% ($0.71/MMBtu) m-o-m to $1.47/MMBtu and $1.24/MMBtu respectively. The weaker price spreads were driven by the sharper decline in the NEA spot LNG price compared to the European spot LNG prices. Similarly, the price spread between the spot LNG price in Asia and the oil-indexed price in Europe dropped by 39% ($4.19/MMBtu) m-o-m to $6.64/MMBtu.

With regards to the spot shipping costs, the NEA/SWE and NEA/NWE spot shipping costs were down by 12% ($0.37/MMBtu) m-o-m each to $2.61/MMBtu and $2.70/MMBtu respectively. However, it should be noted that the shipping cost with vessels under medium and long-term charters might be lower than the spot shipping costs. Although the arbitrage opportunity based on the spot LNG price differentials was out-of-the-money there was one LNG reload from

Europe to Asia in February 2023. The LNG reload came from the Zeebrugge LNG import terminal in Belgium and is being exported to Tangshan Caofeidian LNG import terminal in China.

In comparison to February 2022, the NEA/SWE and NEA/NWE price spreads fell by 32% ($0.70/MMBtu) and 43% ($0.93/MMBtu) y-o-y respectively. Likewise, the price spread between the NEA spot LNG and European oil-indexed gas price slumped by 67% ($13.53/MMBtu) y-o-y. Furthermore, the NEA/SWE and NEA/NWE spot shipping costs declined m-o-m by 10% ($0.28/MMBtu) each.

Figure 80: Price spreads & shipping costs between Asia & Europe spot LNG markets



Source: GECF Secretariat based on data from GECF Shipping Model, Argus and ICIS LNG Edge

4.2.5 Other Developments

Freeport LNG trains 2 and 3 restart operations – the Freeport LNG facility in the US resumed partial exports on February 12, 2023 following an eight-month outage at the facility, which was caused by a fire. The US Energy Regulatory Commission (FERC) granted approval to Freeport LNG on February 22, 2023 for return to commercial operations from trains 2 and 3. Train 3 was the first train to be restarted in the first half of February 2023 followed by train 2, which restarted in the second half of February 2023.

Gabon LNG takes FID – on February 16, 2023, Perenco took the final investment decision (FID) on the Gabon LNG export project. The facility will have a capacity of 0.7 Mtpa and cost $1 billion. The project is expected to take three years to be built with first LNG exports in 2026.

Brunsbüttel FSRU received commissioning LNG cargo – on February 14, 2023, the Brunsbüttel FSRU in Germany received its commissioning LNG cargo. The FSRU arrived in Brunsbüttel on January 20, 2023. The first LNG cargo was loaded at the Das Island LNG export facility in the United Arab Emirates as part of a strategic partnership between ADNOC and RWE.

Poland to increase LNG imports in 2023 – in February 2023, Poland's Gaz System announced plans to increase LNG imports this year. The country imported 58 LNG cargoes in 2022 and is expected to import 64 LNG cargoes this year. Expansion work at the Swinoujscie LNG import terminal is currently ongoing and the capacity will be increased from 4.6 Mtpa currently to 6.1 Mtpa by the end of 2023.

In terms of LNG agreements, several contracts were signed in February 2023 and the details are shown in Table 2 below.

Table 2: New LNG sale agreements signed in February 2023

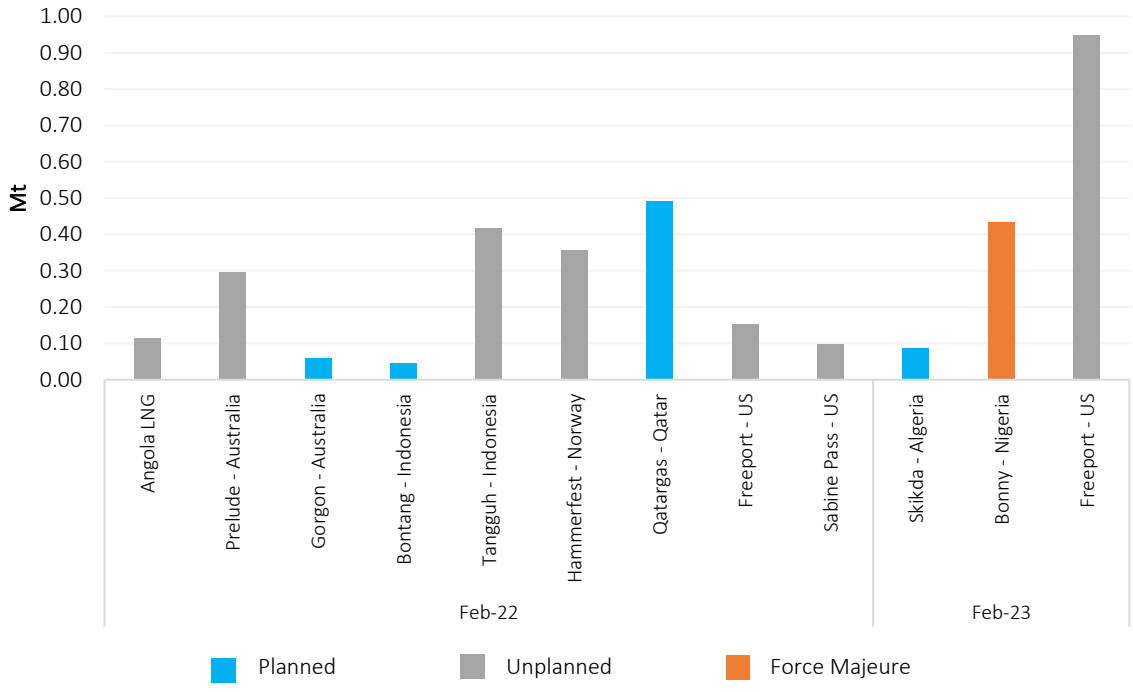
Contract Type	Exporting Country	Project	Seller	Importing Country	Buyer	Volume (Mtpa)	Duration (Years)
Offtake	Mexico	Mexico Pacific LNG	Mexico Pacific	Portfolio	ExxonMobil	1	20
Offtake	Mexico	Mexico Pacific LNG	Mexico Pacific	Portfolio	ExxonMobil	1	20
SPA	Oman	Qalhat LNG	Oman LNG	China	Unipec	1	4
SPA	US	Plaquemines LNG	Venture Global	China	China Gas	1	20
SPA	US	Calcasieu Pass 2	Venture Global	China	China Gas	1	20
SPA	US	Plaquemines LNG	Venture Global	Portfolio	Excelerate	0.7	20

Source: GECF Secretariat based on Project Updates and News

4.2.6 Maintenance Activity at LNG Liquefaction Facilities

In February 2023, 1.47 Mtpa of liquefaction capacity were impacted by planned an unplanned outages, which was down from 2.03 Mtpa of liquefaction capacity that were impacted in February 2022 (Figure 81). At a project level, the Freeport LNG facility in the US was impacted by the unplanned outage in February 2023, while the Skikda LNG facility in Algeria was undergoing planned maintenance activities. Meanwhile, the force majeure on feedgas supply to the liquefaction facility in Nigeria, which was declared in January 2023, remained in effect in February 2023.

Figure 81: Maintenance activity at LNG liquefaction facilities during February 2023



Source: GECF Secretariat based on information from Argus, ICIS LNG Edge and Refinitiv

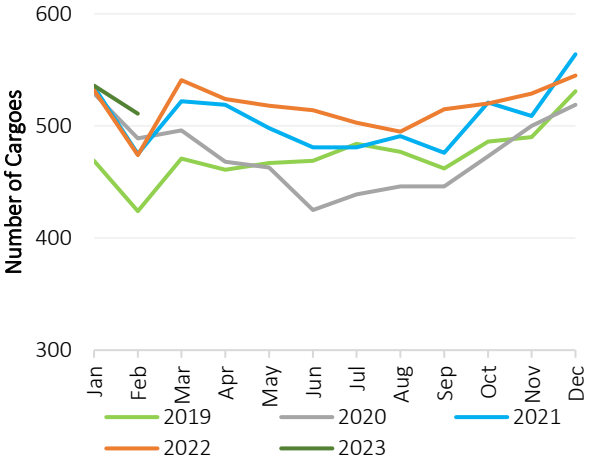
4.2.7 LNG Shipping

In February 2023, the total number of LNG export cargoes decreased by 5% m-o-m to 511 (Figure 82).

The total number of LNG shipments in the first two months of 2023 combined reached 1047, which is 4% or 41 more cargoes than during the same period in 2022 (Figure 83). The US, Australia, and Qatar lead the number of LNG shipments in 2023 thus far.

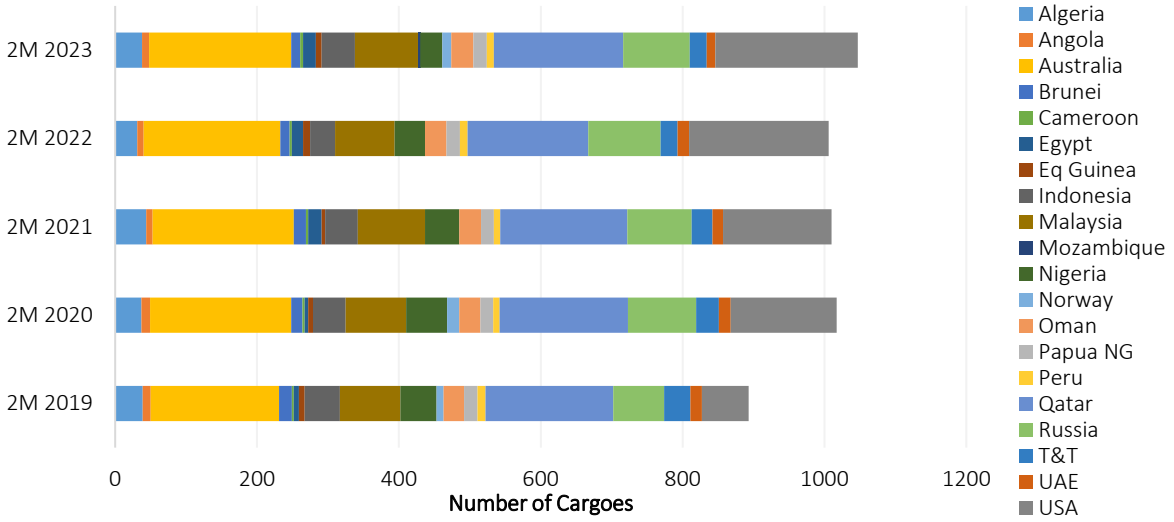
Compared with one year ago, Norway delivered 13 more cargoes in 2023 thus far, while Qatar and Indonesia each delivered 12 more cargoes (Figure 84).

Figure 82: Number of LNG export cargoes



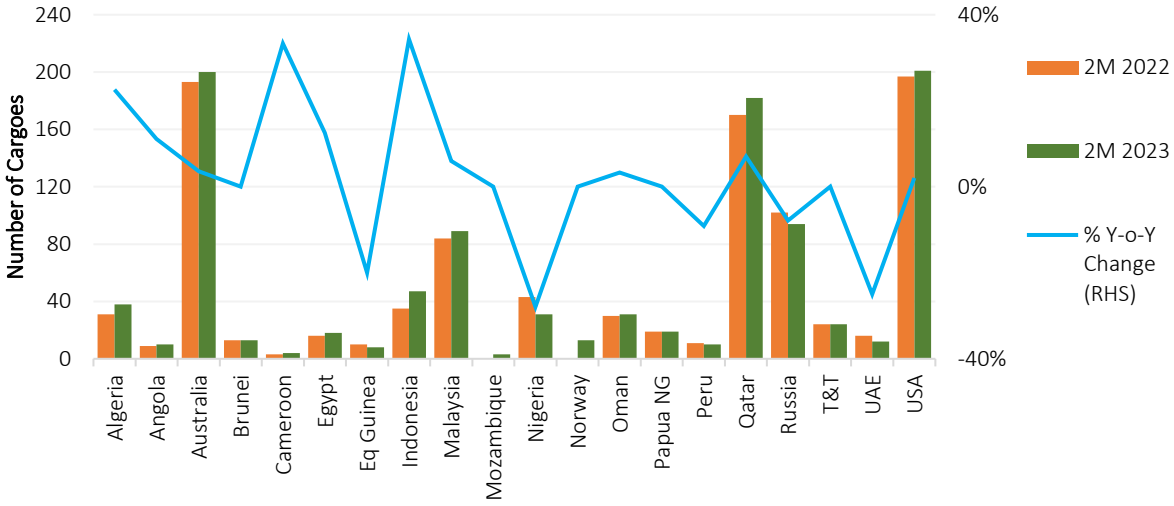
Source: GECF Secretariat based on data from ICIS LNG Edge

Figure 83: Number of LNG cargoes by exporting country



Source: GECF Secretariat based on data from ICIS LNG Edge

Figure 84: Changes in LNG cargo exports

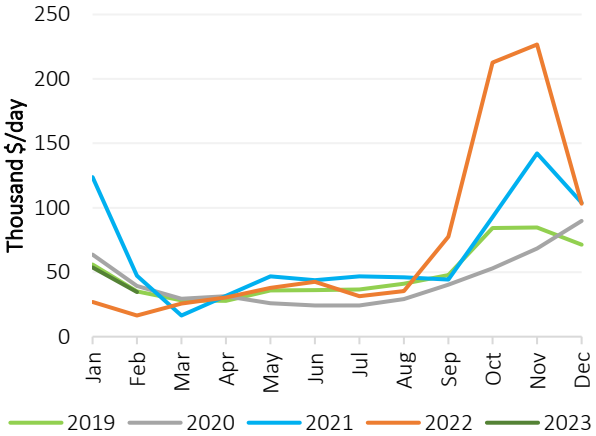


Source: GECF Secretariat based on data from ICIS LNG Edge

In February 2023, the LNG spot charter rate for steam turbine carriers averaged $34,600 per day, which was 36% lower m-o-m, but 111% higher y-o-y (Figure 85). Spot charter rates usually observe a seasonal increase at the end of the year, as demand for LNG grows for the upcoming winter. In 2022, the same factors were at play, coupled with further tightness in the market due to European buyers purchasing cargoes as floating storage, resulting in extremely elevated charter rates. As the winter season commenced, these floating cargoes began to be discharged, freeing up carriers and reducing spot charter rates. Additionally, the mild winter conditions helped to ease gas demand somewhat, contributing to fewer inter-basin flows, and thus charter rates softening even further, from January into February.

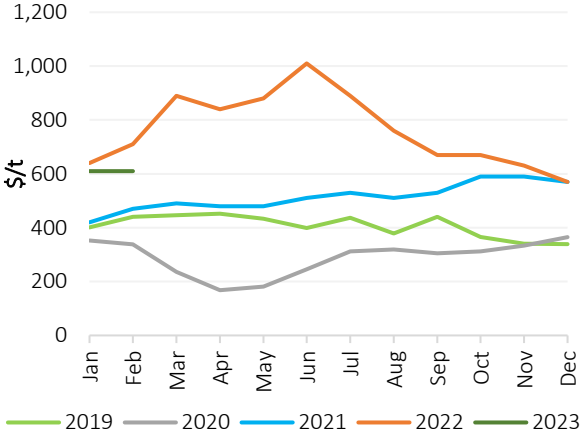
The average price of the leading shipping fuels in February 2023 was $610 per tonne, which was unchanged from the previous month, and 14% lower y-o-y (Figure 86).

Figure 85: Average LNG spot charter rate



Source: GECF Secretariat based on data from ICIS LNG Edge and Argus

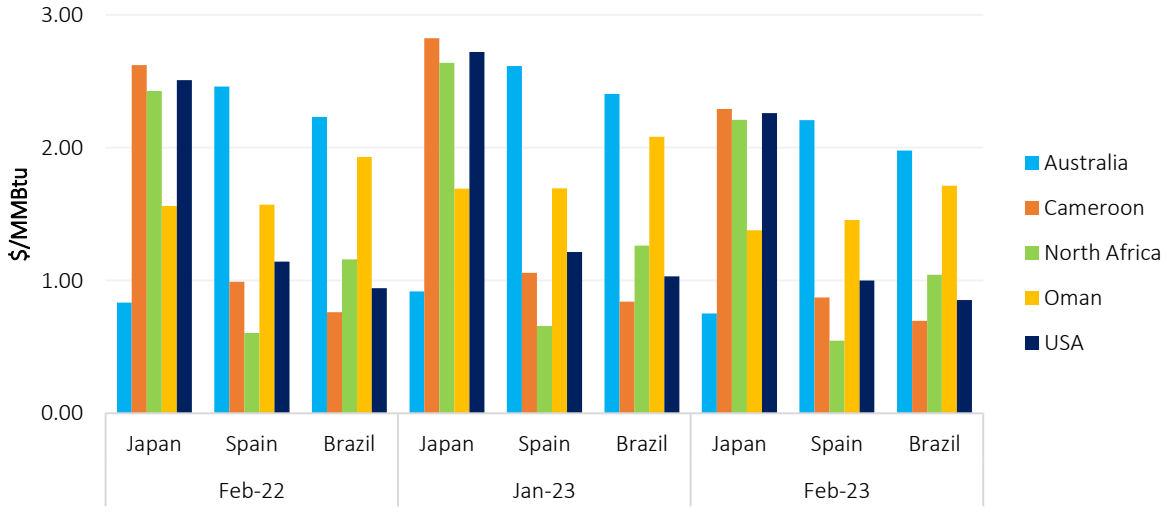
Figure 86: Average price of shipping fuels



Source: GECF Secretariat based on data from Bunker Ports News Worldwide and Argus

The impact of decreases in LNG spot charter rates and delivered spot LNG prices, resulted in a net decrease in the LNG shipping cost, by up to $0.53/MMBtu compared with the previous month (Figure 87). When compared with the same month one year ago, in February 2023 charter rates were greater, but fuel prices and delivered spot LNG prices were lower than in 2022, resulting in LNG shipping costs up to $0.33/MMBtu lower.

Figure 87: LNG spot shipping costs for steam turbine carriers



Source: GECF Shipping Cost Model

Table 3: Shipping costs for LNG spot cargoes from selected regions ($/MMBtu) – February 2023

LNG Supplier	Destination							
	From \ To	Japan	China	India	UK	Spain	Argentina	Brazil
	Spot LNG delivered price	16.01	16.01	14.85	14.15	12.56	17.52	14.74
	Australia	0.75	0.80	0.90	2.33	2.21	1.88	1.98
	Cameroon	2.29	2.26	1.49	0.98	0.87	1.10	0.70
	North Africa	2.21	2.20	1.21	0.64	0.55	1.55	1.04
	Oman	1.38	1.28	0.28	1.56	1.45	1.81	1.71
	USA	2.26	2.49	2.38	1.06	1.00	1.49	0.85

Source: GECF Shipping Cost Model

New LNG carrier design: Chinese shipping firm Bluesoul, through its Norwegian technology subsidiary Torgy LNG, will design a new class of tanks for use on LNG carriers. These new designs are purported to facilitate carriers with a capacity of 235,000m3, and may reduce the shipbuilding period by around 10 months. This project is being developed by Singaporean firm LNG Easy, in partnership with a shipbuilding firm from Finland.

Chevron's plans to minimise the carbon impact of its shipping operations: Chevron Shipping has entered into a partnership with Sembcorp Marine Repairs & Upgrades of Singapore, for the purpose of developing and installing strategies and technologies to reduce the carbon emissions of its LNG carrier fleet. These are aimed at reducing fuel consumption and cargo boil-off, and includes technologies such as reliquefaction, and hull air lubrication.

South Korean shipyards continue to secure LNG carrier orders: South Korea's top shipbuilding firms Samsung Heavy Industries (SHI) and Daewoo Shipbuilding & Marine Engineering (DSME) continue to secure orders for newbuild LNG carriers. SHI received an order worth $500 million for two carriers, while DSME received an order for one carrier worth $248 million, both reflecting the current market prices. All three vessels are expected to be completed by Q1 2027.

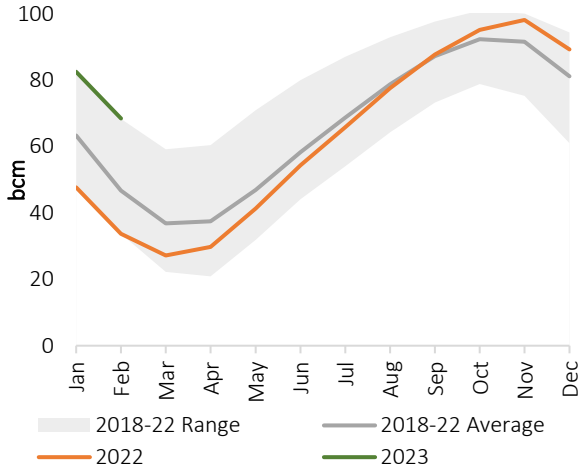
5 Gas Storage

5.1 Europe

The total working capacity for underground gas storage (UGS) sites in the EU stands at 104 bcm. Storage levels in the region remain high, as a result of individual countries surpassing their storage level targets for November 2022, along with the lower gas consumption and milder than expected winter conditions.

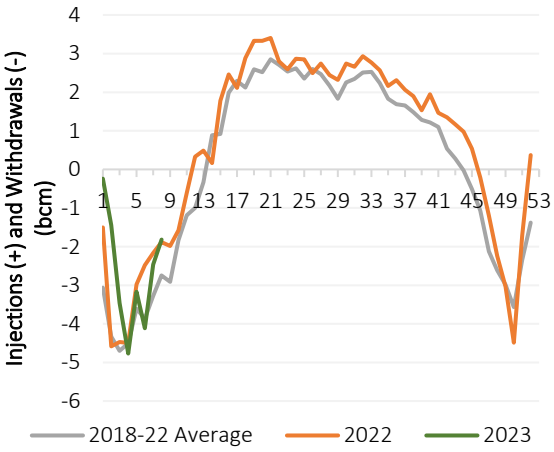
In February 2023, the average daily amount of gas in storage decreased to 68.5 bcm from 82.5 bcm in the previous month (Figure 88). The amount of gas in storage was 34.8 bcm higher than in the same month one year ago, and 21.7 bcm higher than the 5-year historical average. The average UGS capacity utilization fell to 66%. In February, gas injection to UGS amounted to 0.9 bcm, while gas withdrawal reached 12.3 bcm.

Figure 88: Underground gas storage in the EU



Source: GECF Secretariat based on data from AGSI+

Figure 89: Weekly rate of EU UGS level changes



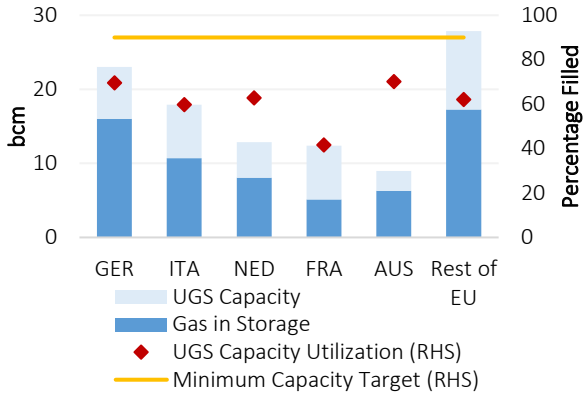
Source: GECF Secretariat based on data from AGSI+

In June 2022, the EU implemented regulations for its member states relating to gas storage. The target was to fill UGS sites to at least 80% of capacity by November 1 2022, and to at least 90% of capacity by November 1 2023. In February 2023, net gas withdrawals were observed, at an average rate of 2.9 bcm/week, which is greater than the 2.4 bcm/week in 2022, but less than the 3.4 bcm/week for the 5-year average (Figure 89).

The minimum storage target was intended to cover 35% of each country's annual gas consumption over the previous five years, but in 2022 many states chose to surpass this level. This ensured that storage levels, even during the latter part of the winter season, remained at a high level, with Germany (70%), Austria (70%), and the Netherlands (63%) in particular ending the month at over three-fifths filled (Figure 90). With respect to member states having no UGS sites of their own, these countries will be able to access storage sites in other member states, up to a capacity of 15% of their annual gas consumption over the previous five years.

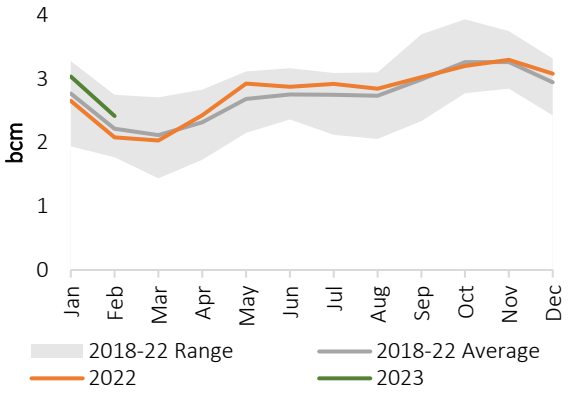
The EU currently has around 4.7 bcm of LNG storage capacity. The majority of this storage is located in Spain (43%) and France (17%). Total LNG storage levels in the region stood at 2.4 bcm in February 2023, which was 20% lower m-o-m, but 16% higher y-o-y (Figure 91). LNG storage levels, like UGS storage levels, have been higher than expected due to the healthy pre-winter stocking, and the milder winter conditions. Additionally, the EU has recently commissioned new regasification capacity to counter the anticipation of lower PNG imports.

Figure 90: UGS in EU countries as of Feb 28, 2023



Source: GECF Secretariat based on data from AGSI+

Figure 91: Total LNG storage in the EU



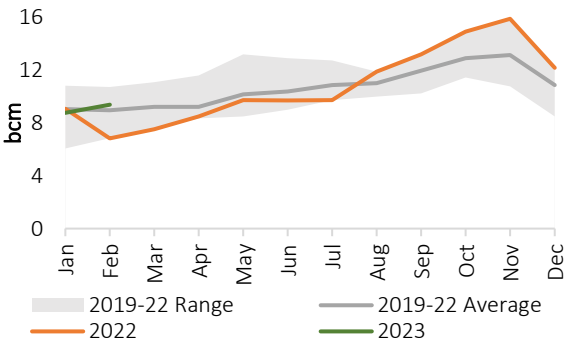
Source: GECF Secretariat based on data from ALSI

5.2 Asia

Japan and South Korea have 9.8 bcm and 6.8 bcm of LNG storage capacity respectively.

By February 2023, total LNG in storage was estimated at 9.4 bcm, which was 7% higher m-o-m, and 37% higher y-o-y (Figure 92). Of this quantity, 4.1 bcm was attributed to Japan, and 5.3 bcm to South Korea. LNG storage levels in the region are still at very high levels, due to the relatively lower gas demand than expected during this winter.

Figure 92: LNG in storage in Japan and South Korea



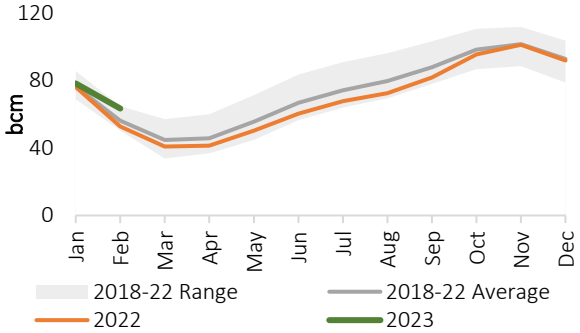
Source: GECF Secretariat based on data from Refinitiv

5.3 North America

The total working gas storage capacity in the US stands at 134 bcm, and the net gas withdrawal season is underway in the country. In February 2023, the average daily amount of gas in storage in the US decreased to 63.3 bcm from 78.1 bcm in the previous month (Figure 93). This amount was 10.6 bcm higher than in the same month one year ago, and 7.2 bcm higher than the 5-year historical average. The average UGS capacity utilization decreased to 47%.

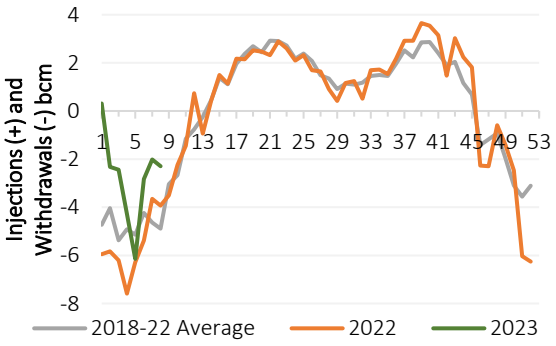
During February 2023, gas withdrawal from storage was observed at an average rate of 3.3 bcm/week, compared with 4.8 bcm/week in 2022, and 4.7 bcm/week for the 5-year average (Figure 94).

Figure 93: Underground gas storage in the US



Source: GECF Secretariat based on data from US EIA

Figure 94: Weekly rate of UGS changes in the US



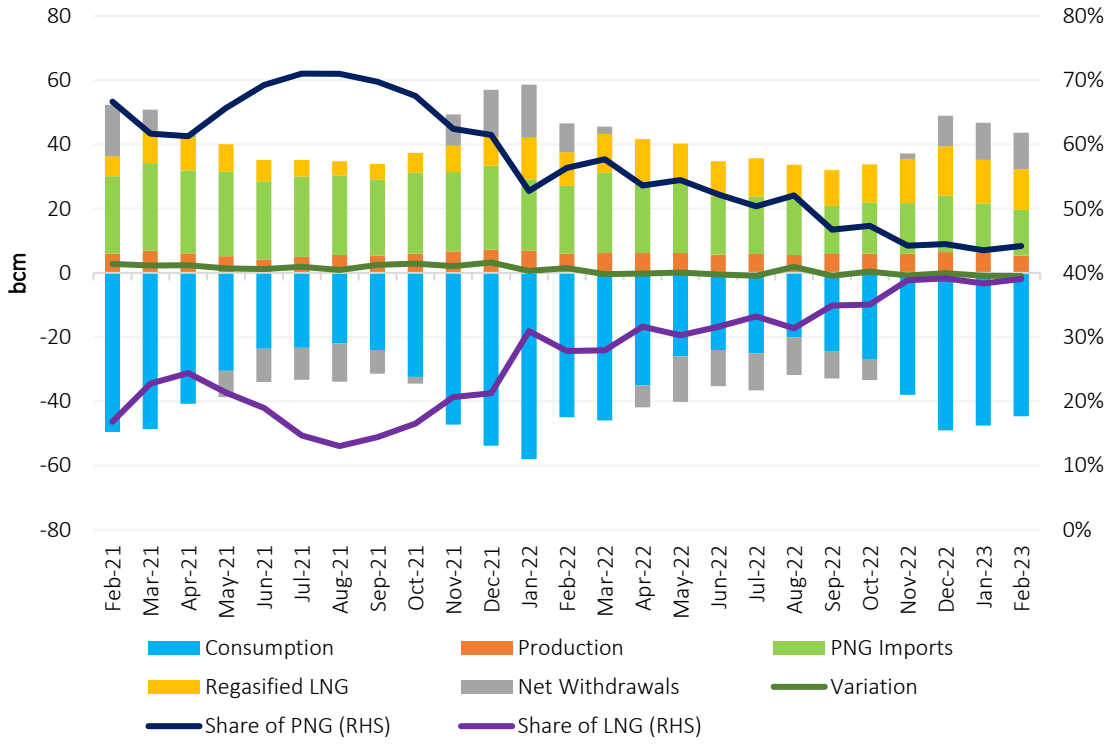
Source: GECF Secretariat based on data from US EIA

6 Gas Balance

6.1 EU + UK

In terms of the gas balance for the EU + UK, PNG and LNG imports account for the bulk of gas supply (excluding storage withdrawal and injection) to the bloc of countries. PNG imports has historically accounted for more than 50% of the pipeline gas supply to the EU + UK, however, since November 2021, the share of LNG in the gas supply to these countries has risen sharply. In February 2023, the share of regasified LNG in the EU + UK's gas supply recorded a m-o-m uptick to 39%, which was 11 percentage points higher than February 2022 (Figure 95). In contrast, the share of PNG in EU + UK's gas supply was stable at 44% in February 2023, compared to the previous month, but fell by 12 percentage points compared to the same period a year earlier. The uptick in the m-o-m share of regasified LNG in EU + UK's gas supply was attributed to the sharper decline in gas production and pipeline gas imports. The shifting reliance from PNG to LNG imports in the EU + UK was driven by the EU's targeted reduction in PNG from Russia. The EU's target to increase LNG imports by 50 bcm in 2022, while reducing PNG imports from Russia, has supported the stronger role of LNG in meeting the gas supply needs of the bloc of countries.

Figure 95: EU + UK monthly gas balance



Note: Variation refers to losses and statistical differences

Source: GECF Secretariat based on data from AGSI+, ICIS LNG Edge, JODI Gas, McKinsey and Refinitiv

6.2 OECD

Table 4 below provides data on the gas supply and demand balance for all OECD countries, including OECD Americas, OECD Asia Oceania and OECD Europe, for the month of November 2022.

Table 4: OECD's gas supply/demand balance for November 2022 (bcm)

	2021	Nov-21	Nov-22	YTD 2021	YTD 2022	Change* y-o-y	Change** 2022/2021
(a) OECD Gas Consumption	1820.4	165.1	153.3	1631.6	1613.0	-7.2%	-1.1%
(b) OECD Gas Production	1582.1	135.2	138.6	1442.0	1508.4	2.5%	4.6%
Difference (a) - (b)	238.3	29.9	14.6	189.6	104.7	-51.0%	-44.8%
OECD LNG Imports	282.5	23.9	30.1	254.8	310.0	25.9%	21.7%
LNG Imports from GECF	148.5	13.5	14.8	135.1	145.1	9.8%	7.4%
LNG Imports from Non-GECF	134.0	10.4	15.2	119.6	164.9	47.0%	37.8%
OECD LNG Exports	209.5	18.1	18.9	189.7	203.4	4.3%	7.2%
Intra-OECD LNG Trade	106.8	8.3	12.6	95.3	136.1	51.0%	42.8%
OECD Pipeline Gas Imports	738.3	58.1	43.9	673.9	584.6	-24.4%	-13.3%
OECD Pipeline Gas Exports	585.0	47.1	42.3	534.1	516.3	-10.1%	-3.3%
Stock Changes and losses	-12.1	-13.0	-1.8	15.4	70.3	-86.4%	355.5%

Source: GECF Secretariat based on data from ICIS LNG Edge and IEA Monthly Gas Statistics

(*): y-o-y change for Nov 2022 compared to Nov 2021

(**): y-o-y change for YTD 2022 compared to YTD 2021

6.3 India

Table 5 below provides data on the gas supply and demand balance for India for the month of January 2023.

Table 5: India's gas supply/demand balance for January 2023 (bcm)

	2022	Jan-22	Jan-23	YTD-2022	YTD-2023	Change* y-o-y	Change** 2022/2021
(a) India Gas Demand	62.44	4.96	5.18	4.96	5.18	4.4%	4.4%
(b) India Gas Production	33.46	2.86	2.91	2.86	2.91	1.8%	1.8%
Difference (a) - (b)	28.98	2.10	2.27	2.10	2.27	7.9%	7.9%
India LNG Imports	28.07	2.45	2.03	2.45	2.03	-17.1%	-17.1%
LNG Imports from GECF	22.15	2.27	1.74	2.27	1.74	-23.5%	-23.5%
LNG Imports from Non-GECF	5.92	0.18	0.29	0.18	0.29	61.5%	61.5%
Stock Changes and losses	-0.91	0.35	-0.24	0.35	-0.24	-167.4%	-167.4%

Source: GECF Secretariat based on data from ICIS LNG Edge and India's PPAC

(*): y-o-y change for Jan 2023 compared to Jan 2022

(**): y-o-y change for YTD 2023 compared to YTD 2022

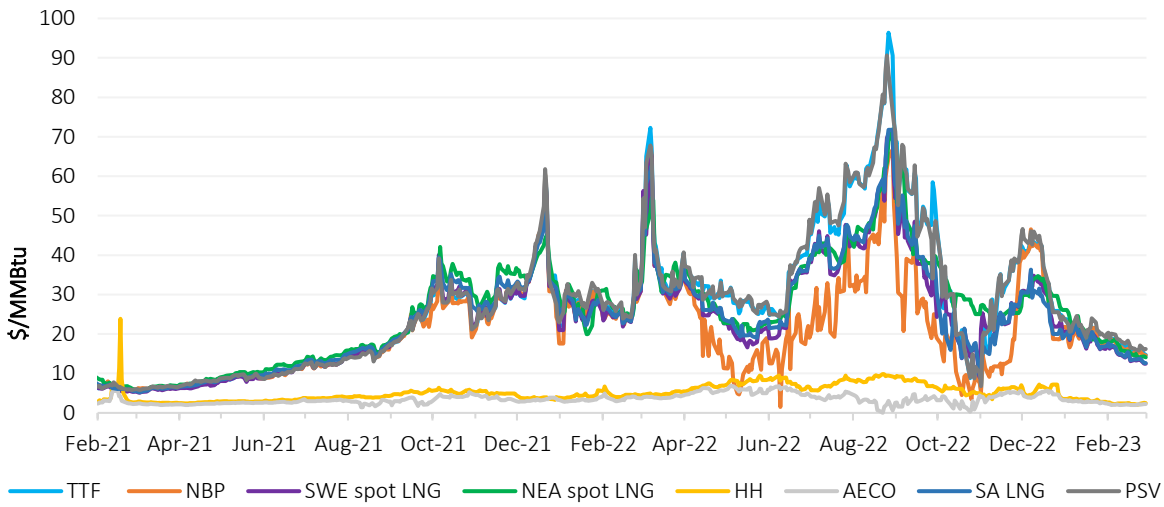
7 Energy Prices

7.1 Gas Prices

7.1.1 Gas & LNG Spot Prices

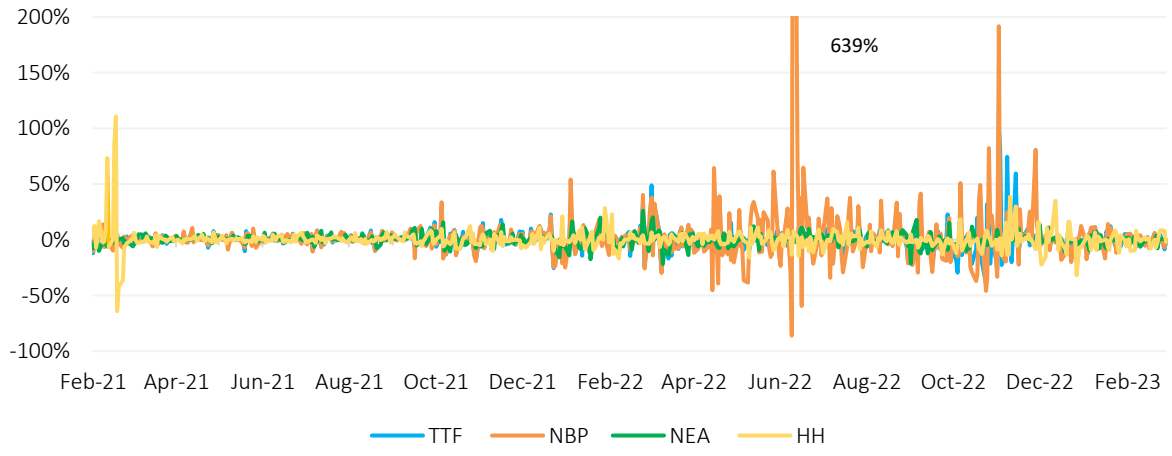
In February 2023, gas and LNG spot prices in Europe and Asia decreased for the second consecutive month, with relatively lower volatility (
Figure 96 and Figure 97). Soft market fundamentals including tepid demand due to mild weather, ample supply and robust cargo availability across both regions weighed on spot prices. However, there is some emerging demand in price-sensitive Asian markets due to lower spot prices.

Figure 96: Daily gas & LNG spot prices



Source: GECF Secretariat based on data from Argus and Refinitiv Eikon
Note: SA LNG price is an average of the LNG delivered prices for Argentina, Brazil and Chile based on Argus assessment.

Figure 97: Daily variation of spot prices



Source: GECF Secretariat based on data from Argus and Refinitiv Eikon

7.1.1.1 European Spot Gas and LNG Prices

In February 2023, TTF and NBP spot gas prices averaged $16.73/MMBtu and $16.13/MMBtu, declining sharply by 16% and 15% m-o-m respectively (Figure 98). Furthermore, both TTF and NBP spot prices were 37% lower y-o-y.

The SWE spot LNG prices averaged $14.49/MMBtu in February 2023, 23% lower m-o-m and 44% lower y-o-y. The PSV spot price averaged $17.73/MMBtu in February 2023, 17% lower m-o-m and 36% lower y-o-y.

European gas and LNG prices continued to decline due to mild weather particularly in the last two weeks of the month, which reduced gas demand for heating. Healthy storage levels, strong LNG sendout and efforts to reduce gas consumption in the region also contributed to the downward movement. Furthermore, daily TTF and NBP spot prices dropped below $15/MMBtu during the month.

For January and February 2023, NBP and TTF averaged $18.34/MMBtu and $17.52/MMBtu and were 51% and 31% lower y-o-y respectively. TTF dropped to a daily low of $14.71/MMBtu.

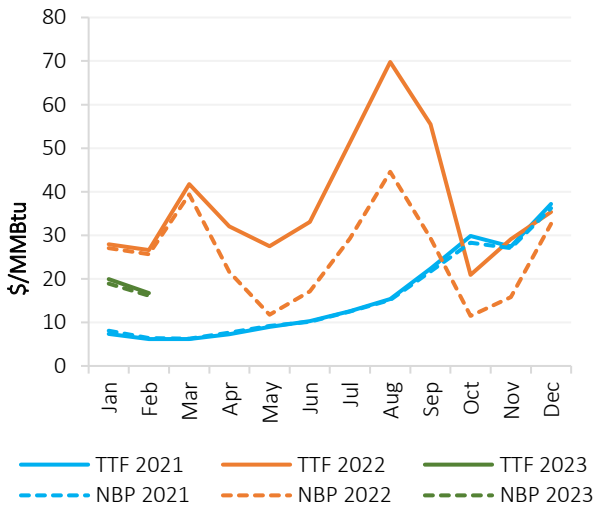
7.1.1.2 Asian Spot LNG Prices

In February 2023, the average North East Asia (NEA) spot LNG price declined by 23% m-o-m to average $15.96/MMBtu. In addition, it was 43% lower than the average of $27.82/MMBtu in February 2022 (Figure 99).

Soft market fundamentals amidst healthy supply and lukewarm demand continued to weigh on prices in the region. The restart of the Freeport LNG terminal also added to the already robust cargo availability. Buying interest from northeast Asia remained muted however, there was some emerging demand in price-sensitive markets in Southeast Asia. Moreover, daily NEA spot LNG prices fell below $14/MMBtu, its lowest since July 2021.

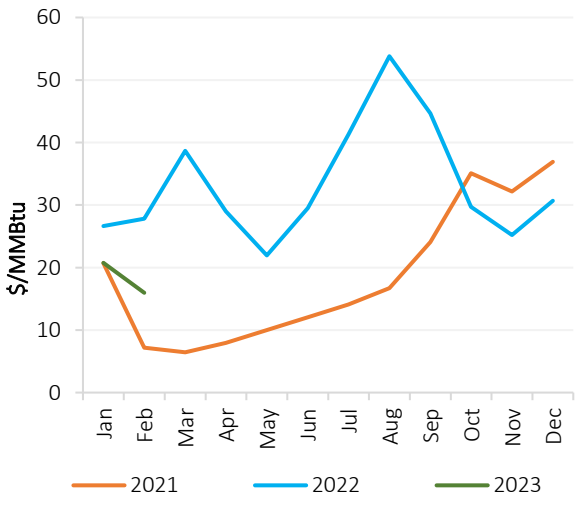
Furthermore, the average NEA spot LNG price over the first two months of 2023 was $18.36/MMBtu and 45% lower y-o-y.

Figure 98: Monthly European spot gas prices



Source: GECF Secretariat based on data from Refinitiv Eikon

Figure 99: Monthly Asian spot LNG prices



Source: GECF Secretariat based on data from Argus and Refinitiv Eikon

7.1.1.3 North America Spot Gas Prices

In February 2023, HH spot gas price decreased by 27% m-o-m to average $2.38/MMBtu, and was 49% lower than the average of $4.69/MMBtu in February 2022 (Figure 100).

HH spot prices were driven by weakened gas demand due to overall warmer temperatures. In addition, US gas storage levels remained above the five-year average.

Similarly, in Canada, the AECO spot price decreased by 26% m-o-m, averaging $2.10/MMBtu in February 2023, and was 44% lower y-o-y.

From January – February 2023, the HH spot price was $2.83/MMBtu and 56% lower y-o-y. Furthermore, the AECO spot price was $2.47/MMBtu and 41% lower y-o-y.

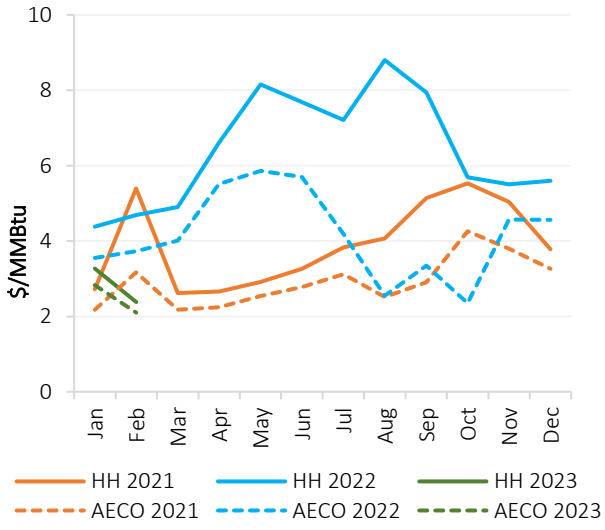
7.1.1.4 South America Spot LNG Prices

In February 2023, South American (SA) LNG price decreased by 22% m-o-m to average $14.73/MMBtu, and was 44% lower than the average of $26.14/MMBtu in February 2022 (Figure 101).

LNG spot prices in South America continued to track European and Asian spot prices. LNG delivered prices for Argentina, Brazil and Chile averaged $14.85/MMBtu, $14.50/MMBtu and $14.85/MMBtu respectively in February 2023.

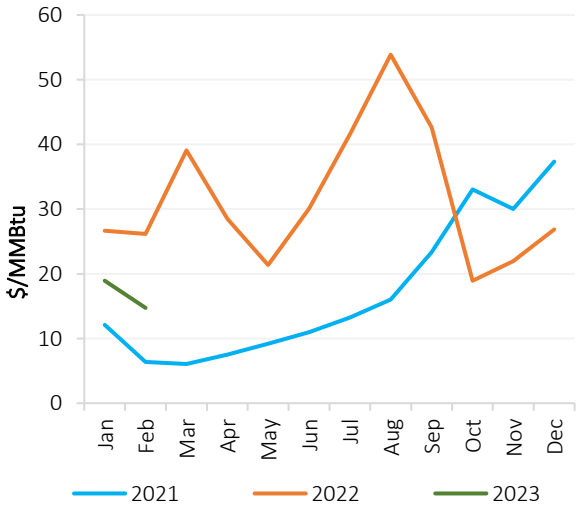
For January and February 2023, the SA LNG spot price averaged $16.83/MMBtu, and was 47% lower y-o-y.

Figure 100: Monthly North American gas spot prices



Source: GECF Secretariat based on data from Argus and Refinitiv Eikon

Figure 101: Monthly South American LNG spot prices



Source: GECF Secretariat based on data from Argus.

Note: SA LNG price is an average of the LNG delivered prices for Argentina, Brazil and Chile based on Argus assessment

7.1.2 Spot and Oil-indexed Long-Term LNG Price Spreads

In February 2023, Oil-indexed I LNG price averaged $13.65/MMBtu decreasing by 3% m-o-m, but was 10% higher y-o-y. Similarly, the Oil-indexed II LNG price averaged $9.78/MMBtu decreasing by 3% m-o-m, but was 6% higher y-o-y (Figure 102). The discount of Oil-indexed I and Oil-indexed II prices to the average NEA spot LNG price narrowed significantly in comparison to the previous month to around $2/MMBtu and $6/MMBtu respectively.

In Europe, the Oil-indexed III price averaged $9.32/MMBtu in February 2023, decreasing by 3% m-o-m, but was 22% higher y-o-y (Figure 103). The average SWE LNG held a premium of $5/MMBtu over the Oil-indexed III price, which was lower compared to the previous month.

For January and February 2023, the Oil-indexed I, II LNG prices were 6% and 11% lower y-o-y respectively. Meanwhile, the Oil-indexed III LNG price was 3% higher y-o-y.

Figure 102: Asia: Spot and oil-indexed price spread

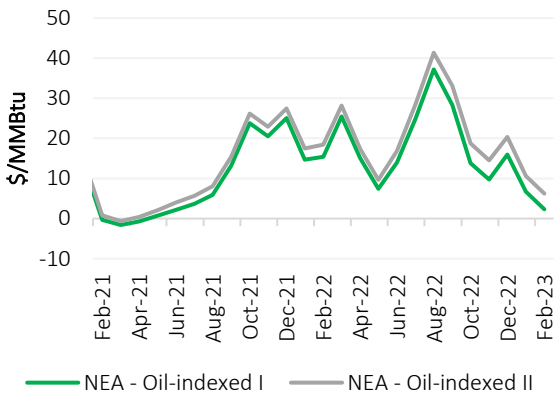
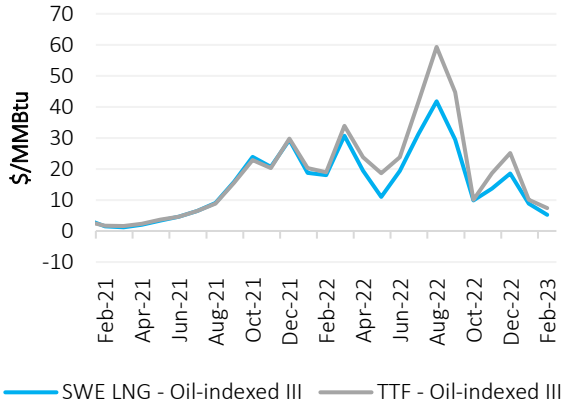


Figure 103: Europe: Spot and oil-indexed price spread



Source: GECF Secretariat based on data from Argus and Refinitiv Eikon
Note: Oil-indexed I LNG prices are calculated using the traditional LTC slope (14.9%) and 6-month historical average of Brent. Oil-indexed II LNG prices are calculated using the 5-year historical average LTC slope (11.1% for 2023) and 3-month historical average of Brent. Oil-indexed III LNG prices are based on Argus' assessment for European oil-indexed long-term LNG prices.

7.1.3 Regional Spot Gas & LNG Price Spreads

In February 2023, the average NEA-TTF price spread turned negative, with TTF gaining a slight premium of $0.77/MMBtu (Figure 104). Both NEA LNG and TTF spot prices continued to lose momentum during the month but the NEA LNG spot price experienced a steeper decline.

NBP traded at a discount of $0.60/MMBtu to TTF, lower than the average of $1.04/MMBtu during the previous month (Figure 105). Both TTF and NBP spot prices continued to decline by around 15% m-o-m resulting in some convergence between both European spot prices.

Furthermore, the NWE LNG spot price traded at a discount of $2/MMBtu to TTF (Figure 106). Northwest Europe regasification terminals continue to operate close to maximum capacity however; high storage levels and reduced gas demand in the region have kept the discount relatively small. The NWE LNG-SA LNG price spread was negligible in February 2023 indicating a strong convergence between both prices (Figure 107).

The NEA-HH and TTF-HH spreads narrowed in February 2023 to $13.58/MMBtu and $14.35/MMBtu respectively (Figure 108 and Figure 109). Thus, European and Asian spot

prices held a lower premium over North American spot prices as mild weather drove weaker demand in both regions.

Figure 104: NEA-TTF price spread

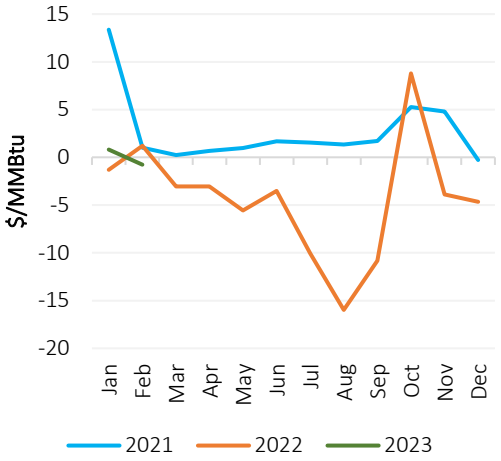


Figure 105: NBP-TTF price spread

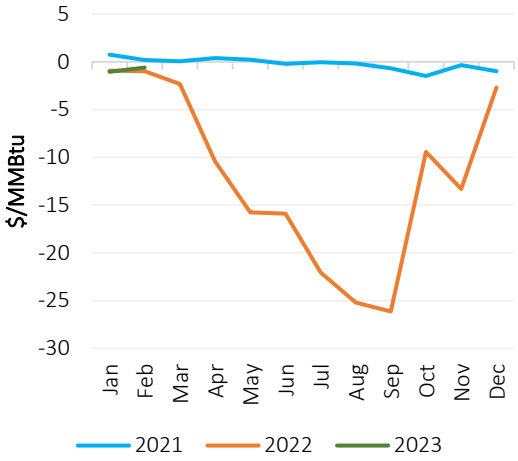


Figure 106: NWE LNG-TTF price spread

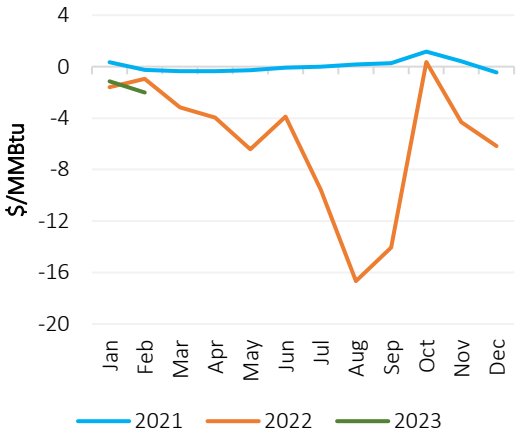


Figure 107: NWE LNG – SA LNG price spread

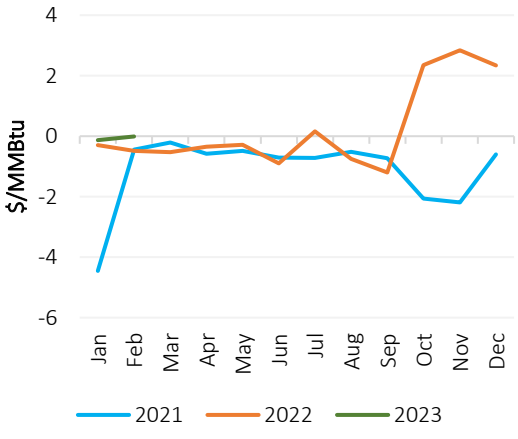


Figure 108: NEA-HH price spread

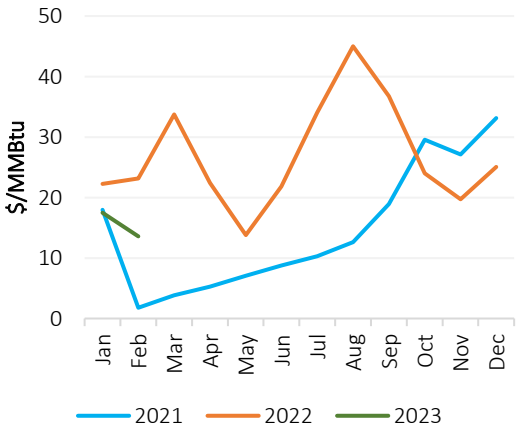
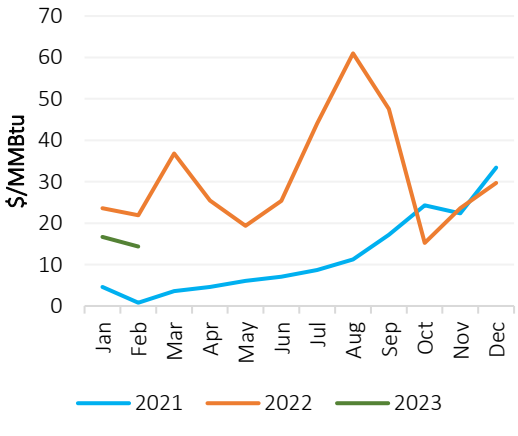


Figure 109: TTF-HH price spread



Source: GECF Secretariat based on data from Argus and Refinitiv Eikon

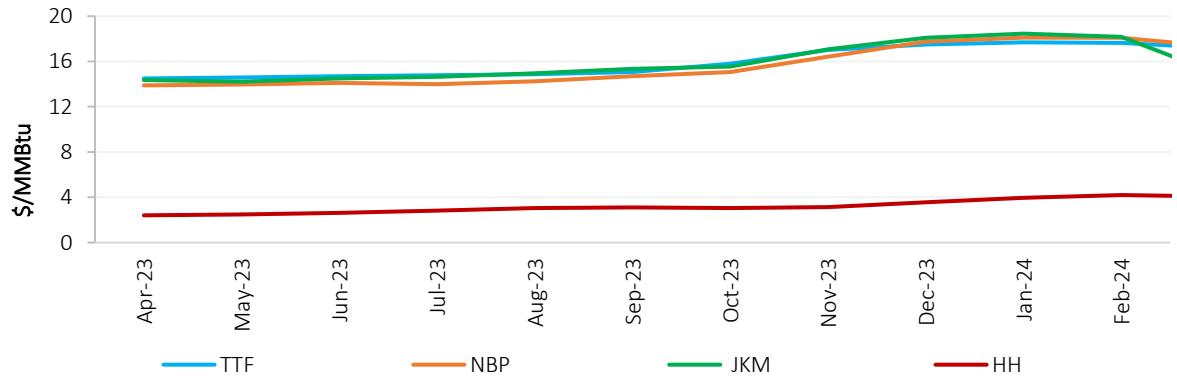
7.1.4 Gas & LNG Futures Prices

The JKM-TTF futures price spread is expected to be slightly negative in Q2 2023, indicating a slight premium of TTF prices over Asian LNG prices. However, in H2 2023, JKM is expected to gain a small premium of less than $1/MMBtu over TTF spot prices. This trend continues into Q1 2024 (Figure 110).

With regard to the disparity between the TTF and NBP spot prices, NBP is expected to continue to trade at a discount to TTF, albeit at a very narrow discount of less than $1/MMBtu until November 2023. Subsequently, in December 2023, the spread flips slightly positive with NBP gaining a slight premium of around $0.3/MMBtu, which continues into Q1 2024.

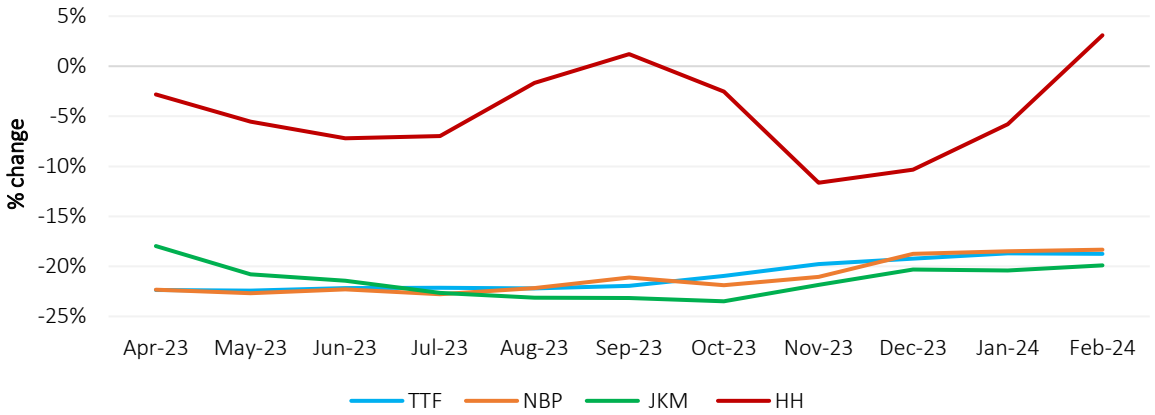
For the 6-month period from April - September 2023, the gas and LNG futures prices (as of March 1, 2023) for TTF, NBP and JKM were all lower than the expectations of the futures prices considered on February 7, 2023 (and as reported in the GECF MGMR February 2023). The average TTF, NBP and JKM futures prices for this period were $14.75/MMBtu, $14.15/MMBtu and $14.67/MMBtu respectively. In addition, the average HH futures price was $2.75/MMBtu, which was similar to previous expectations (Figure 111).

Figure 110: Gas & LNG futures prices



Source: GECF Secretariat based on data from Refinitiv Eikon
Note: Futures prices as of March 1, 2023.

Figure 111: Variation in gas & LNG futures prices



Source: GECF Secretariat based on data from Refinitiv Eikon
Note: Comparison with the futures prices as of February 7, 2023 as reported in GECF MGMR February 2023.

7.2 Cross Commodity Prices

7.2.1 Oil Prices

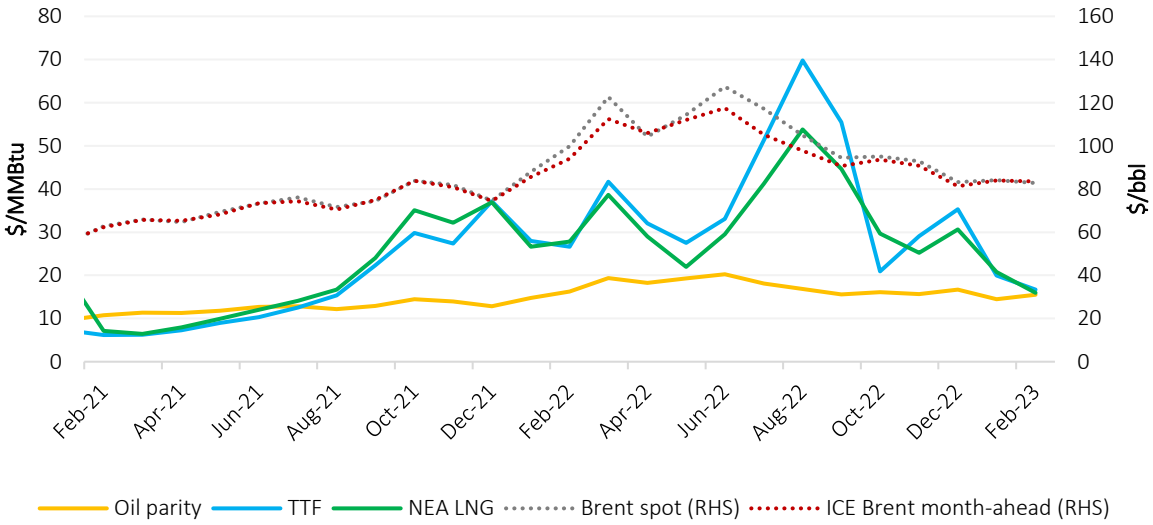
In February 2023, Brent spot averaged $82.78/bbl, decreasing slightly by 2% m-o-m, and was 17% lower y-o-y (Figure 112). Brent one month-ahead price averaged $83.54/bbl, which relatively stable compared to the previous month, but 17% lower y-o-y.

Oil prices were slightly lower due to high US crude stocks, and concerns about slowing economic growth and more aggressive interest rate hikes by the US Fed. However, losses were limited by expectations of strong Chinese oil demand growth particularly in the transportation sector, as well as the announcement of production cuts from Russia by 500,000 bbl/d in March 2023.

Furthermore, due to the decline in TTF spot prices in February 2023, the premium over the oil parity price decreased further to around $1/MMBtu. In addition, the premium of NEA LNG spot price over the oil parity price decreased to less than $1/MMBtu.

For the period January – February 2023, Brent spot price averaged $83.46/MMBtu, and was 8% lower y-o-y. Meanwhile, Brent month-ahead price averaged $83.73/MMBtu, and was 5% lower y-o-y.

Figure 112: Monthly crude oil prices



Source: GECF Secretariat based on data from Refinitiv Eikon
Note: Conversion factor of 5.8 was used to calculate the oil parity price in $/MMBtu based on the ICE Brent month-ahead price.

7.2.2 Coal Prices

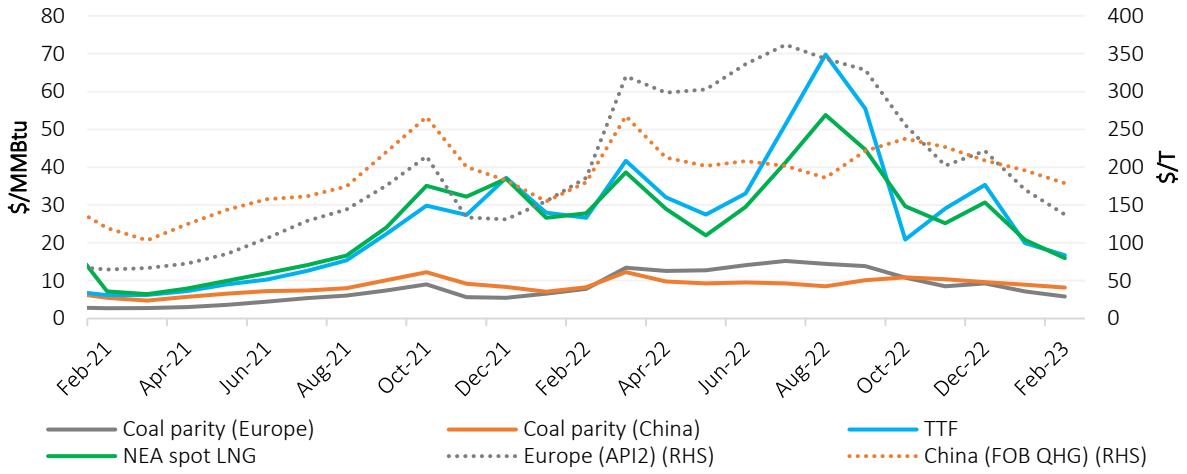
In February 2023, the European coal price (API2) decreased by 19% m-o-m, averaging $137.51/T, and was 26% lower y-o-y. This was the lowest since December 2021. Meanwhile, in China, the QHG coal price marker decreased by 9% m-o-m to average $179.03/T, and was 1% lower y-o-y, reaching its lowest level since January 2022 (Figure 113).

In Europe, mild weather and low TTF spot prices may have weakened coal demand in the region and thus weighed on coal prices.

The premium of TTF spot price over the API2 parity price decreased further to $11/MMBtu in February 2023, and was 14% lower m-o-m. In addition, the premium of NEA spot LNG price over the QHG parity price narrowed to $8/MMBtu, 34% lower m-o-m.

For the period January – February 2023, the European API2 averaged $153.90/T, 10% lower y-o-y, while the Chinese QHG price averaged $187.40/T, 12% higher y-o-y.

Figure 113: Monthly coal parity prices



Source: GECF Secretariat based on data from Argus and Refinitiv Eikon
Note: Conversion factors of 23.79 and 21.81 were used to calculate the coal prices in $/MMBtu for Europe (API2) and China (QHG) respectively.

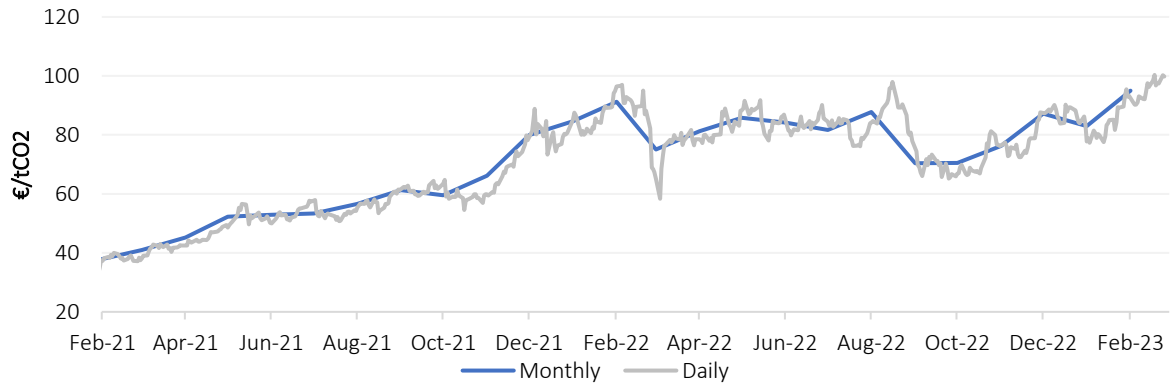
7.2.3 Carbon Prices

In February 2023, EU carbon prices averaged €95/tCO2, increasing 14% m-o-m and was 4% higher y-o-y (Figure 114).

The upward momentum of EU carbon prices was driven by strong buying interest from utilities and low wind generation. EU carbon prices reached a record high of €100/tCO2 at the end of February 2023.

For the period January – February 2023, EU carbon prices averaged €89.02/tCO2, and was 1% higher y-o-y.

Figure 114: EU carbon prices



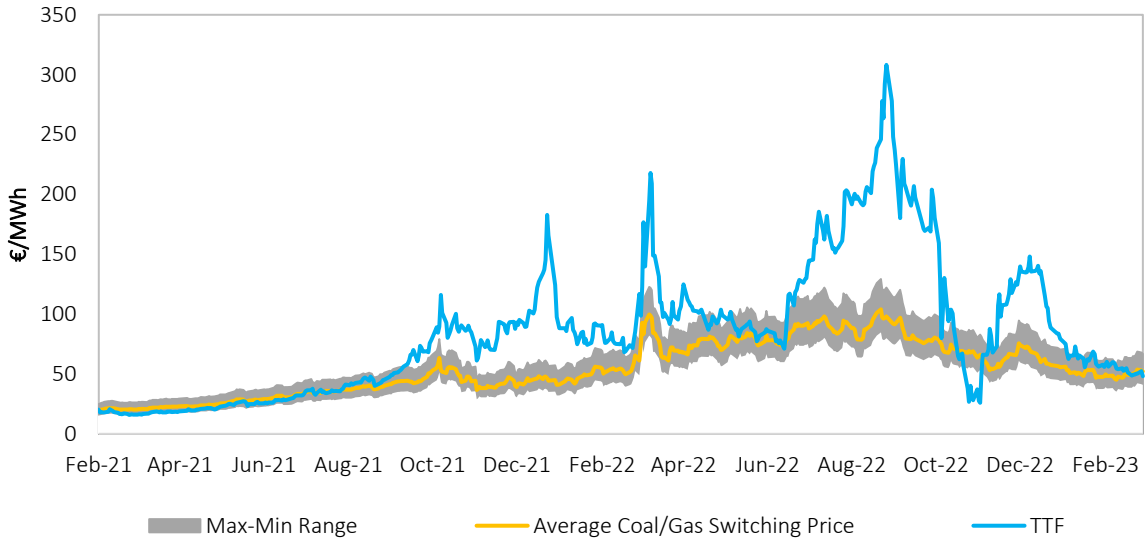
Source: GECF Secretariat based on data from Refinitiv Eikon

7.2.4 Fuel Switching

In February 2023, daily TTF spot prices fell within the coal-to-gas switching range. The coal-to-gas switching price averaged €49.18/MWh, which was 3% lower m-o-m, largely due to lower European coal prices. The monthly spread between the TTF spot price and the average coal-to-gas switching price narrowed significantly to €5/MWh, compared to €12/MWh during the previous month (Figure 115).

Furthermore, in Q2 2023, the TTF spot price is expected to remain within the coal-to-gas switching range. Thus, there is likely to be an increase in coal-to-gas switching in Europe.

Figure 115: TTF vs coal-to-gas switching price



Source: GECF Secretariat based on data from Refinitiv Eikon
Note: Coal-to-gas switching price is the price of gas at which generating electricity with coal or gas is equal. The estimate takes into consideration coal prices, CO2 emissions prices, operation costs and power plant efficiencies. The efficiencies considered for gas plants are max: 56%, min: 46%, avg: 49.13%. The efficiencies considered for coal plants are max: 40%, min: 34%, avg: 36%.

7.3 Other Developments

The EU market correction mechanism (MCM) entered into force on February 15, 2023 for a period of one year. The MCM will be triggered if the following two conditions are met: the front-month TTF settlement price exceeds €180/MWh for three days and is €35/MWh higher than the reference price during the same period.

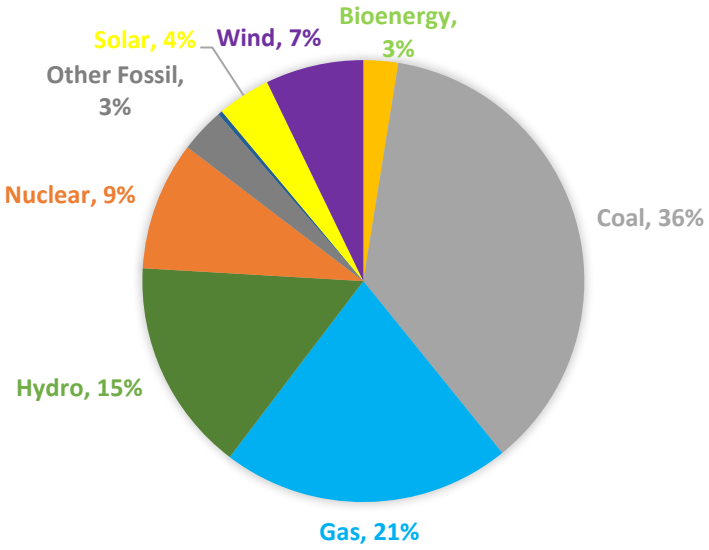
Furthermore, the operators of the Intercontinental Exchange (ICE) in which TTF derivatives are traded, assessed the potential implications of this regulation on trading and financial stability, and decided to launch a parallel TTF market to allow its clients to adequately manage their risk exposure if the MCM prevents such functioning. Accordingly, the ICE launched its parallel TTF market at its London-based ICE Futures Europe Exchange on February 20, 2023. However, based on the current market dynamics, it is unlikely that this mechanism will be activated in the short-term.

7.4 Feature Article: The Role of Gas in Global Power Generation Mix in 2022

In 2022, energy consumption in the global power generation sector increased by 1.8% y-o-y, reaching a total of 27,927 TWh. However, the share of natural gas declined from 22% in 2021 to 21% in 2022, as a consequence of high gas spot prices and higher competitiveness of alternative fuels, even those with significant environmental footprints. Although gas consumption in the power sector declined by 0.2% y-o-y to 6,050 TWh in 2022, the power generation sector still remains the key driver of gas consumption with a share of 44% of the global gas consumption in 2022.

In the meantime, coal still maintained the largest share of the power generation mix at 36% in 2022. Coal power generation recorded a growth of 1% y-o-y (+102 TWh), with coal power plants benefitting from the high gas prices and gas-to-coal switching in many regions. Hydropower production reached 4,294 TWh, or 15% share. Global renewable power generation continued to grow with an increase of 7% compared to 2021 (+200 TWh). Over the past five years, power output from renewables has more than doubled, driven by increasing policy support globally (Figure 116).

Figure 116: Global power generation mix in 2022



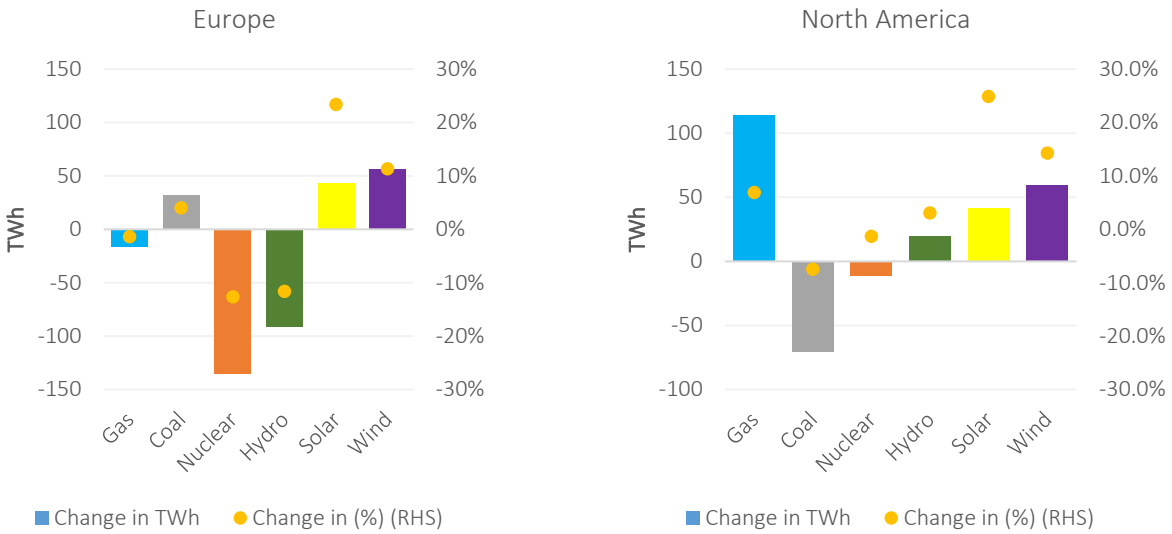
Source: GECF Secretariat based on data from Ember

In 2022, the power generation mix of each region continued to be influenced by several factors, including availability of energy resources, cost of competing fuels, regulatory framework, subsidies, environmental policies and available technologies. Amidst the unprecedented energy crisis in various regions, we witnessed a marked shift to more polluting fuels for power generation, which could inhibit achievement of global CO2 emissions reduction targets.

In 2022, European gas consumption in the power generation sector declined by 1% compared to 2021. However, it remains the dominant fuel with a share of 27% of the total electricity production mix. Nuclear accounted for 20% (937 TWh) of the power generation mix. Coal accounted for 18% (816 TWh), with coal-fired generation witnessing an increase of 4% y-o-y due to a rise in gas-to-coal switching because of high spot gas and LNG prices. Renewables followed with 17% (776 TWh), and hydro with 15% (698 TWh).

In contrast, gas played a greater role in the power generation mix of North America. Total power generation increased by 3.2% y-o-y to reach 4,880 TWh. Gas consumption in the power sector was 1,760 TWh, representing an increase of 7% y-o-y. Its main competing fuel, coal, declined sharply by 8% y-o-y. This consumption pattern was mainly driven by switching back to gas, despite the high gas prices, as gas-fired generation benefitted from tightening coal supply and rising coal prices that limited power generators' switching ability. Renewable generation rose by 17% y-o-y as additional solar and wind capacity were added to the grid (Figure 117).

Figure 117: Y-o-Y variation in the power generation mix in Europe and North America



Source: GECF Secretariat based on data from Ember

8 Abbreviations

Abbreviation	Explanation
AE	Advanced Economies
AECO	Alberta Energy Company
bcm	Billion cubic metres
bcma	Billion cubic metres per annum
bcm/yr	Billion cubic metres per year
CBAM	Carbon Border Adjustment Mechanism
CBM	Coal bed methane
CCS	Carbon, Capture and Storage
CCUS	Carbon Capture, Utilization and Storage
CDD	Cooling Degree Days
CIS	Commonwealth of Independent States
CNG	Compressed Natural Gas
CO_2	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
CPI	Consumer Price Index
DOE	Department of Energy
DQT	Downward Quantity Tolerance
EC	European Commission
ECB	European Central Bank
EEXI	Energy Efficiency Existing Ship Index
EMDE	Emerging Markets and Developing Economies
EU	European Union
EU ETS	European Union Emissions Trading Scheme
EUA	European Union Allowance
Fed	Federal Reserve
FID	Final Investment Decision
FSU	Floating Storage Unit

FSRU	Floating Storage Regasification Unit
G7	Group of Seven
GDP	Gross Domestic Product
GECF	Gas Exporting Countries Forum
GHG	Greenhouse Gas
HDD	Heating Degree Days
HH	Henry Hub
IEA	International Energy Agency
IMF	International Monetary Fund
IMO	International Maritime Organization
JKM	Japan Korea Marker
LNG	Liquefied Natural Gas
LAC	Latin America and the Caribbean
LT	Long term
MMBtu	Million British thermal units
mmcm	Million cubic metres
MENA	Middle East and North Africa
METI	Ministry of Trade and Industry in Japan
m-o-m	month-on-month
Mt	Million tonnes
Mtpa	Million tonnes per annum
MWh	Megawatt hour
NEA	North East Asia
NBP	National Balancing Point
NDC	Nationally Determined Contribution
NGV	Natural Gas Vehicle
NZBA	Net-Zero Banking Alliance
OECD	Organization for Economic Co-operation and Development
PNG	Pipeline Natural Gas

PPAC	Petroleum Planning & Analysis Cell
QHG	Qinhuangdao
R-LNG	Regasified LNG
SA	South America
SPA	Sales and Purchase Agreement
SWE	South West Europe
T&T	Trinidad and Tobago
TANAP	Trans-Anatolian Natural Gas Pipeline
TCFD	Task Force on Climate-Related Financial Disclosure
Tcm	Trillion cubic metres
tCO2	Tonne of carbon dioxide
TTF	Title Transfer Facility
TWh	Terawatt hour
UGS	Underground Gas Storage
UAE	United Arab Emirates
UK	United Kingdom
UQT	Upward Quantity Tolerance
US	United States
y-o-y	year-on-year

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The Gas Exporting Countries Forum (GECF or Forum) is an intergovernmental organisation gathering the world's leading gas producers and exporters, whose objective is to provide a framework for the exchange of views, experiences, information and data, and cooperation and collaboration amongst its Members in gas-related matters. The GECF comprises 12 Member Countries and 7 Observer Members. The Member Countries of the Forum are Algeria, Bolivia, Egypt, Equatorial Guinea, Iran, Libya, Nigeria, Qatar, Russia, Trinidad and Tobago, United Arab Emirates and Venezuela. Angola, Azerbaijan, Iraq, Malaysia, Mozambique, Norway and Peru have the status of Observer Members.

The GECF Monthly Gas Market Report (MGMR) is a monthly publication of the GECF focusing on short-term developments in the global gas market related to the global economy, gas consumption, gas production, gas trade (including pipeline gas and LNG), gas storage and energy prices.

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