



GECF

# MONTHLY GAS MARKET REPORT

July 2023

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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 (pipeline gas and LNG), gas storage and energy prices.

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## Highlights

**Global economy:** The global GDP growth forecast for 2023 has been revised upward by 0.2 percentage points from the previous month's forecast, reaching 2.4%. This marks the second consecutive upward revision made by Oxford Economics. During its last meeting on June 14, the US Federal Reserve chose to take a cautious pause in its interest rate hikes, following ten consecutive increases. Global inflation is expected to gradually ease to 5.9% in 2023.

**Gas consumption:** In June 2023, the European Union witnessed a substantial 12% year-on-year drop in gas consumption to 18 bcm. The industrial sector continued its declining trend despite dropping gas prices. In contrast, China's apparent gas consumption surged by 5% year-on-year from January to May 2023, reaching 162 bcm. The United States maintained a steady course, with gas consumption remaining at the same level as June 2022, reaching 64 bcm.

**Gas production:** In May 2023, Europe's gas production declined by 16% y-o-y, reaching 13.7 bcm. This decrease was due to lower output from the region's leading producers, in particular Norway, the UK and the Netherlands. In June 2023, US shale gas production observed a y-o-y increase of 5%, amounting to a total production of 82.6 bcm. The global gas rig count, an indicator of upstream activity, declined by 11 units m-o-m but surged by 22 units y-o-y, culminating in a total of 372 units in June 2023. May 2023 witnessed the discovery of approximately 700 million boe, taking the cumulative discovered volumes in the first five months of 2023 to 2 billion boe.

**Gas trade:** Pipeline gas imports to the EU continued to decline in June 2023, falling by 8% m-o-m, to reach 11.6 bcm. However, the pace of y-o-y growth in global LNG imports accelerated to 6.8%, reaching 32.8 Mt. This growth was driven by a strong rebound in the Asia Pacific region, led by China. China's monthly LNG imports reached their highest level since January 2022, and the region's LNG imports rebounded to the same level in 2021. In fact, the level of gas imports in China, including both LNG and PNG, continued to surge m-o-m, reaching their record level for the month of June.

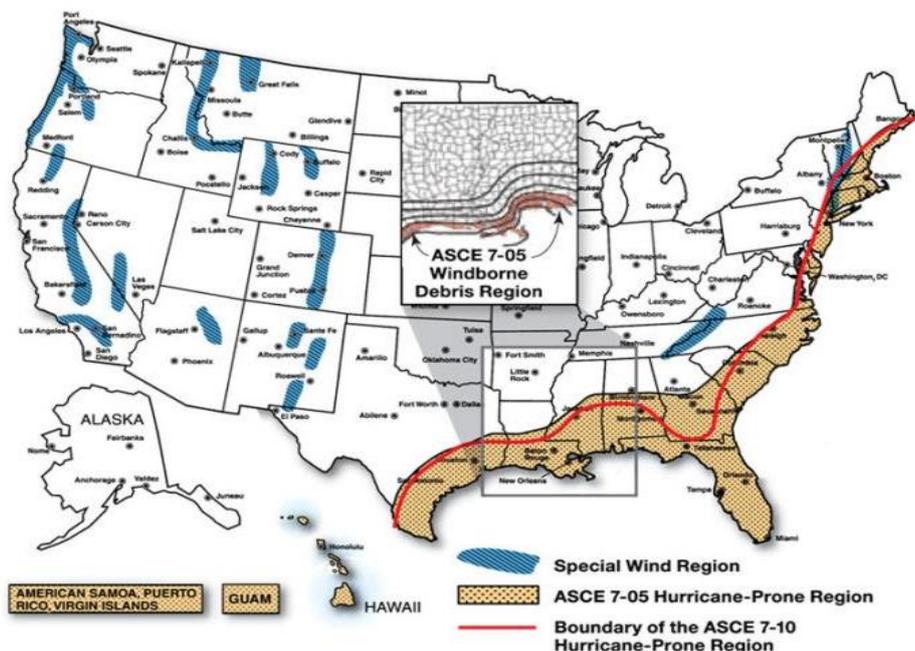
**Gas storage:** The net gas injection season is ongoing in both Europe and North America. In the European Union, the average level of gas in underground storage in June 2023 rose to 76.6 bcm, representing 74% of the region's storage capacity. This high level of gas in storage has slowed down the rate of gas injections, contributing to the stability of gas and LNG spot prices. In the United States, the level of underground gas storage rose to 77.0 bcm, equivalent to 57% of its capacity. The estimated combined LNG storage in Japan and South Korea stands at 11.2 bcm.

**Energy prices:** Gas and LNG spot prices in Europe and Asia experienced a slight uptick in June 2023, after continuous decline over the previous five months. Daily TTF spot prices reached a three-month high of \$13/MMBtu, while daily NEA spot LNG prices exceeded \$11/MMBtu. European gas and LNG spot prices showed bullish movement, driven by extensive maintenance activities at upstream and LNG facilities. However, the global gas market fundamentals remain relatively weak due to subdued demand in both Asia and Europe, along with elevated EU gas storage levels. Spot prices are expected to receive support in the coming months from warmer weather and the possibility of prolonged maintenance activities.

## Feature Article: Impact of the Atlantic Hurricane Season on US LNG Exports

The Atlantic hurricane season typically runs from June to November each year. The majority of LNG facilities in the United States (US) are located in the Gulf of Mexico (GoM), which is known for its susceptibility to hurricanes (Figure 1). Consequently, these LNG facilities are at risk of experiencing outages and indirect impacts, such as precautionary shutdowns, disruptions in electricity supply and closure of ship canals, when hurricanes pass through the GoM.

Figure 1: Map of hurricane prone region in the US



Source: Extracted from <https://basc.pnnl.gov/images/hurricane-prone-regions-united-states-asce-7-05-and-7-10-boundaries>

Since the commencement of LNG exports in 2016, several US LNG facilities in the GoM have been affected by hurricanes. The year 2020 recorded the most significant impact, with nearly 3 Mt of LNG supply affected (Table 1).

Table 1: US LNG supply impacted by the passage of hurricanes

Year	LNG Terminal	LNG Supply Impacted (Mt)	Description of Impact
2017	Sabine Pass LNG	0.46	Closure of the Sabine Pass ship canal during Hurricane Harvey reduced loadings
2020	Sabine Pass LNG	0.74	Precautionary shutdown ahead of Hurricane Laura
2020	Cameron LNG	2.03	Passage of Hurricane Laura disrupted electricity supply to the terminal
2021	Freeport LNG	0.51	Passage of Hurricane Nicholas disrupted electricity supply to the terminal

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

The National Oceanic and Atmospheric Administration (NOAA) and Colorado State University (CSU) are the two main organisations that provide forecasts for the Atlantic hurricane season. NOAA issues two forecasts, one in May and another in August, while the CSU releases four forecasts in April, June, July and August. This analysis considered NOAA’s May forecast and CSU’s June forecast only.

Both organisations have forecasted a near-normal 2023 Atlantic hurricane season (Table 2). In June 2023, the NOAA confirmed the emergence of an El Nino, “a natural climate phenomenon marked by warmer-than-average sea surface temperatures in the central and eastern Pacific Ocean near the equator, which occurs on average every 2-7 years”<sup>1</sup>. El Nino conditions typically suppress Atlantic hurricane activity, providing justification for the near-normal hurricane forecast.

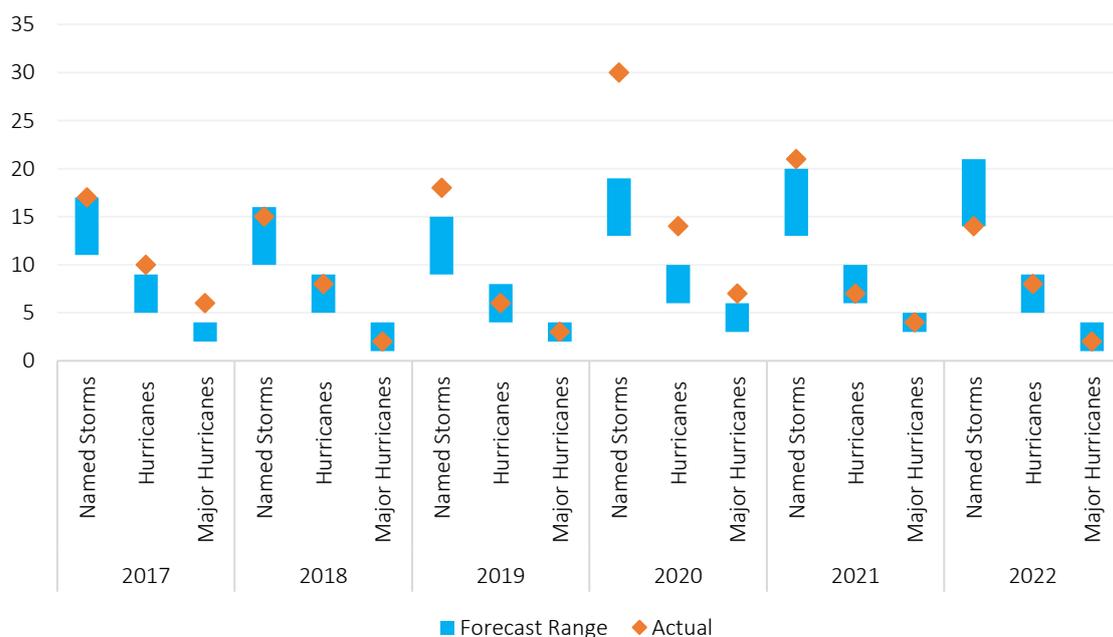
Table 2: Atlantic hurricane outlook 2023

Forecast Parameters	NOAA Forecast 2023	CSU Forecast 2023	Average (1991-2020)
Named Storms	12-17	15	14.4
Hurricanes	5-9	7	7.2
Major Hurricanes	1-4	3	3.2

Source: GECF Secretariat based on data from National Oceanic and Atmospheric Administration (NOAA) and Colorado State University (CSU)

However, it is important to note that NOAA’s hurricane season forecast is not always accurate. For instance, in 2020, the actual number of storms, hurricanes and major hurricanes exceeded NOAA’s forecast (Figure 2). Similarly, in 2017, the actual number of hurricanes and major hurricanes surpassed NOAA’s predictions.

Figure 2: Comparison of NOAA’s forecasted storms and hurricanes with the actual

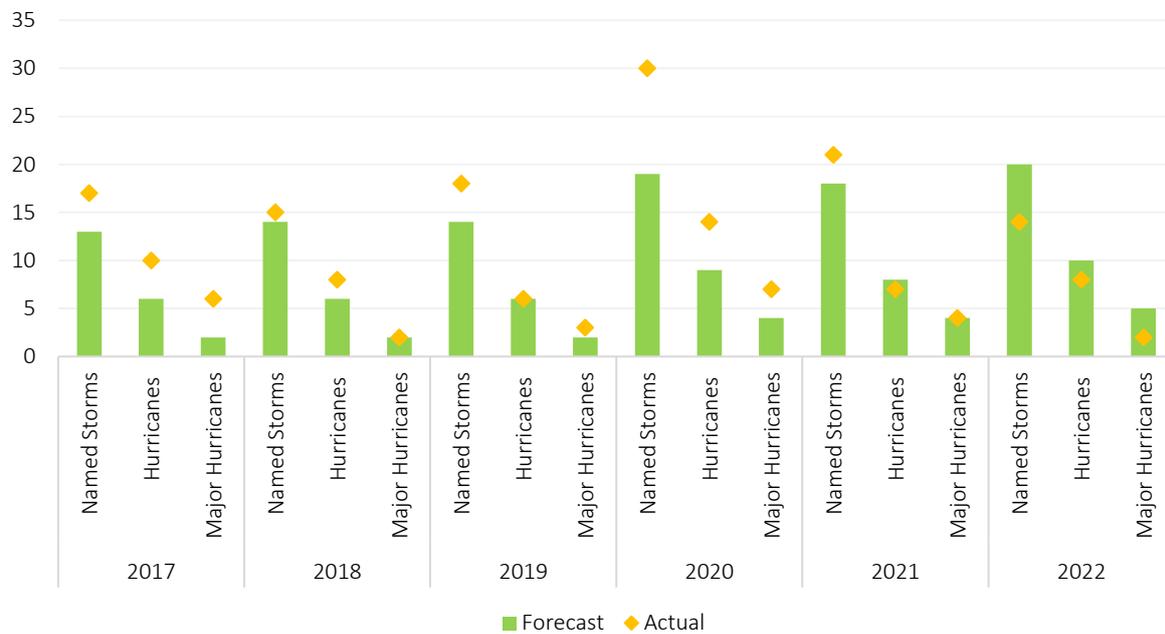


Source: GECF Secretariat based on data from National Oceanic and Atmospheric Administration (NOAA)

<sup>1</sup> <https://www.weather.gov/news/230706-ElNino#:~:text=El%20Nino%20is%20a%20natural,far%20beyond%20the%20Pacific%20Ocean>

Meanwhile, CSU’s Atlantic hurricane forecast tends to be less accurate than NOAA’s. NOAA provides a range of forecasts for storms and hurricanes whereas CSU provides a single value. CSU’s Atlantic hurricane forecasts varied significantly from the actual number of storms and hurricanes in 2017, 2020 and 2022 (Figure 3).

**Figure 3: Comparison of the CUS's forecasted storms and hurricanes from the actual**



Source: GECF Secretariat based on data from National Oceanic and Atmospheric Administration (NOAA) and Colorado State University (CSU)

It should be noted that neither NOAA nor CSU provide specific forecasts regarding hurricanes making landfall, as the trajectory of a hurricane is highly dependent on ocean and atmospheric conditions at the time of formation. Despite the near-normal forecast for the 2023 hurricane season, a single hurricane making landfall on the US Gulf Coast could have a substantial impact on LNG supply from facilities in that area. Considering that the US is poised to become the world’s largest LNG exporter in 2023, any disruption in LNG supply could lead to market tightness and consequently drive up spot LNG prices.

# 1 Global Perspectives

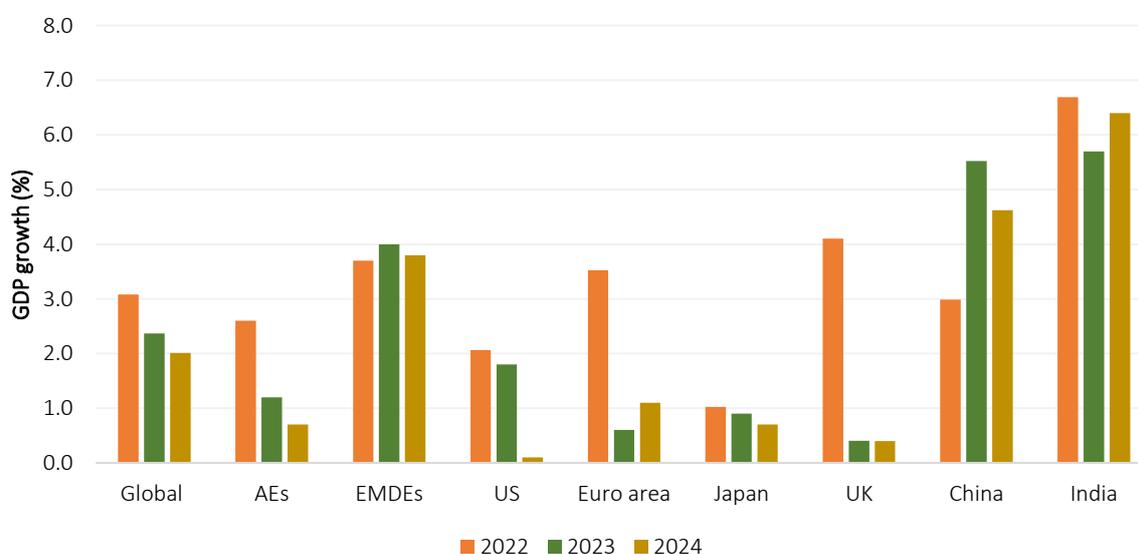
## 1.1 Global Economy

Oxford Economics, in its World Economic Prospects July 2023 report, revised its global GDP growth forecast for 2023 upward for the second consecutive month, increasing it by 0.2 percentage points to 2.4%. However, the global GDP growth forecast for 2024 was adjusted downwards by 0.2 percentage points to 2% due to the lagged effect of monetary policy tightening (Figure 4).

The outlook for GDP growth in Advanced Economies (AEs) has been revised upwards by 0.2 percentage points, with an expected growth rate of 1.2% in 2023. However, there is a slight softening anticipated to 0.7% in 2024. In the US, the GDP growth forecast has been raised by 0.5 percentage points to 1.8% in 2023. The US economy has remained resilient due to strong consumer spending and robust exports, which are likely to postpone a mild recession expected in Q3 2023 to Q4 2023. In the Euro area, the GDP growth has been revised downward to 0.6% in 2023. Weakened manufacturing and restrictive financial conditions will be the main drivers of slower growth in the second half of 2023. Moreover, economies with a higher reliance on manufacturing activities such as Germany and Italy are expected to experience slower growth in the upcoming months. Conversely, countries that heavily depend on tourism, such as Spain and Portugal are likely to experience stronger growth. As for Japan, its GDP growth forecast was also revised upward and stands at 0.9% in 2023, reflecting its ongoing resilience, but it may face headwinds due to weak external demand.

GDP growth in Emerging Markets and Developing Economies (EMDEs) has also seen an upward revision, with projected growth rates of 4% in 2023, followed by a slight softening to 3.8% in 2024. China's GDP growth forecast was maintained at 5.5% in 2023 and 4.6% in 2024. In an effort to support demand, policymakers have announced interest rate cuts, with further easing expected in the remaining months of the year. However, slowing external demand and high debt burdens may dampen China's growth prospects. In addition, India's GDP growth has been revised upwards by 0.1 percentage points to 5.7% in 2023.

Figure 4: GDP growth forecast



Source: GECF Secretariat based on data from Oxford Economics

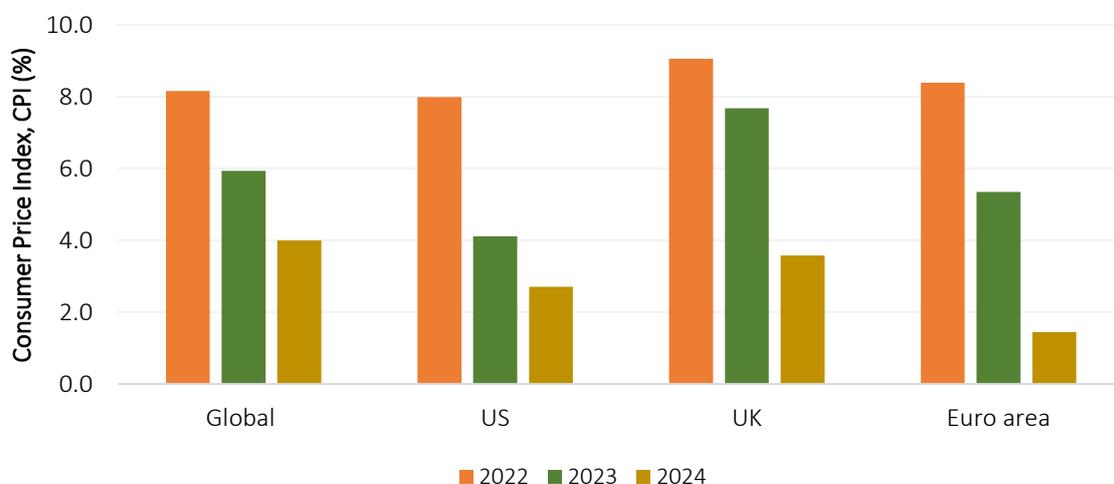
In June 2023, the World Bank's Global Economic Prospects and the OECD's Economic Outlook reports were released. These reports offered valuable insights into the global and regional economic outlook and the factors that are likely to shape the global economy in the next two years.

The World Bank projects global GDP growth of 2.1% in 2023, an upward revision from its previous forecast of 1.7% in January 2023. However, the report also highlighted several downside risks to the global economy, including the tightening of monetary policies, increasing borrowing costs, potential stress in the banking sector and sustained slower growth in emerging and developing countries.

The OECD predicts global GDP growth of 2.7% in 2023, reflecting an upward revision from its previous forecast of 2.6% in March 2023. This revision is attributed to several factors, including lower energy prices and economic recovery in China. Nonetheless, the report echoed the prevailing sentiment of significant uncertainty surrounding economic prospects, with major downside risks to projections. Of particular concern is the potential for inflation to persist longer than anticipated. The OECD also called on governments to eliminate energy subsidies and enhance financial support for investments in the energy transition, including energy efficiency measures.

Global inflation is likely to continue to gradually ease as the impact of tight monetary policies take effect, as well as weaker energy and commodity prices, and further mitigation of supply chain bottlenecks. However, headline inflation is still anticipated to remain above targeted rates in major economies until 2024 or beyond. According to the latest forecast from Oxford Economics, global inflation is projected to decrease from 8.2% in 2022 to 5.9% in 2023, followed by a further reduction to 4% in 2024. Specifically, in the US, inflation is projected to average 4.1% in 2023, with a decline to 2.7% in 2024. In the Euro area, inflation is anticipated to average 5.3% in 2023, followed by a subsequent decline to 1.4% in 2024. The UK is expected to experience inflation averaging 7.7% in 2023, before decreasing to 3.6% in 2024 (Figure 5).

Figure 5: Inflation rates

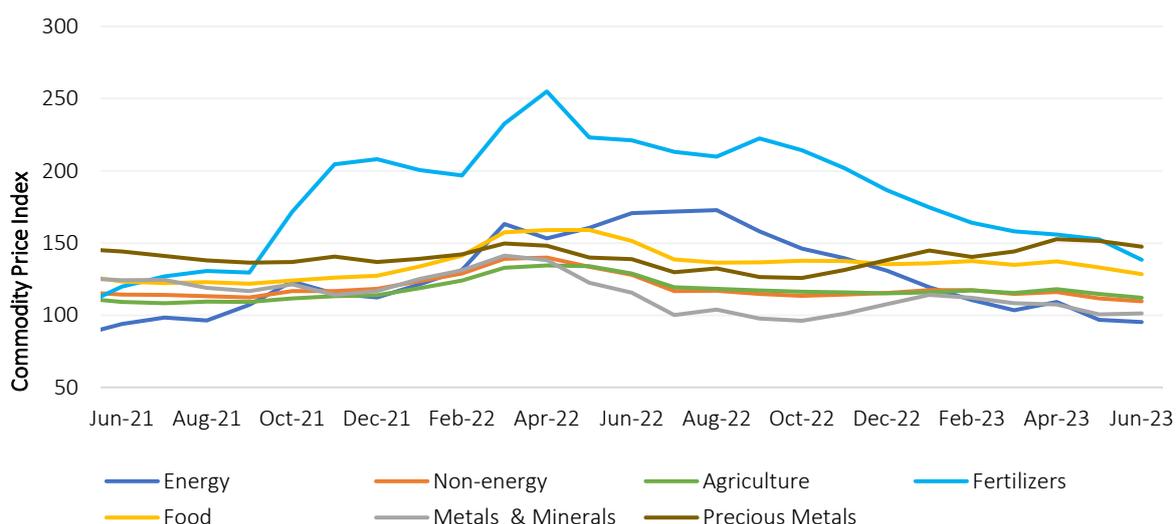


Source: GECF Secretariat based on data from Oxford Economics

In June 2023, commodity prices in the energy and non-energy sectors declined for the second consecutive month. The energy price index decreased by 2% m-o-m and was 44% lower y-o-y. This decline was driven primarily by lower oil and coal prices. Oil prices hovered around \$75/bbl, remaining at 18-month lows. Additionally, coal prices in China fell to their lowest level since March 2021.

The non-energy price index also saw a decrease of 2% m-o-m and was 14% lower y-o-y. Within the non-energy sectors, the agriculture price index decreased by 2% m-o-m, while the metals and minerals price index slightly increased by 1% m-o-m. Additionally, the fertilizer price index witnessed a further decrease by 9% m-o-m, marking its ninth consecutive monthly decline and was 37% lower y-o-y (Figure 6).

Figure 6: 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. 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%).

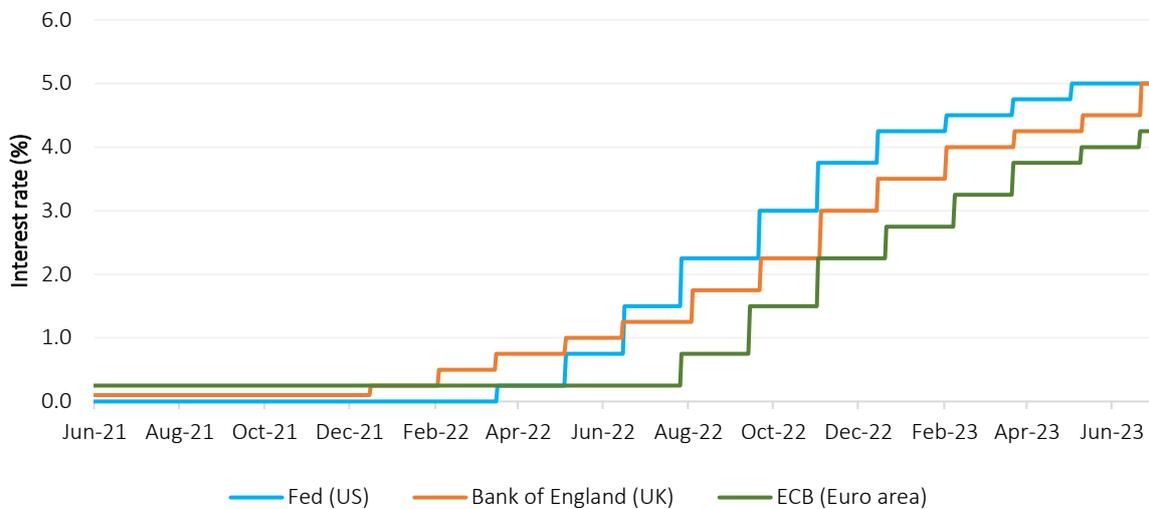
During its recent meeting on June 14, the US Federal Reserve (Fed) paused its interest rates hikes after a series of ten consecutive rate hikes since March 2022. As a result, the Fed's benchmark interest rates remained within the range of 5.00-5.25%. However, policymakers hinted that two additional 0.25 percentage point hikes may be necessary later in the year.

In contrast, the European Central Bank (ECB) raised its key interest rates by 0.25 percentage points on June 21. Similarly, on June 22, the Bank of England (BOE) increased its benchmark interest rate by 0.5 percentage points to reach 5%, the highest level in 15 years (Figure 7). These actions were taken in response to persistently high inflation, which continues to exceed the 2% target in these economies.

In China, the People's Bank of China (PBOC) lowered three of its key benchmark lending rates in June 2023 in an effort to stimulate economic activity. This marked the first reduction in the rates in ten months. On June 15, 2023, the PBOC cut the medium-term lending facility (MLF) rate by 0.1 percentage points, bringing it down to 2.65%. The MLF rate applies to one-year loans offered to financial institutions, The one-year loan prime rate (LPR), a benchmark for

corporate loans, was also reduced by 0.1 percentage points, taking it to 3.55%. Similarly, the five-year LPR, which is typically used for mortgages, was lowered by the same margin to 4.2%. In addition, China’s State Council has stated that more policy measures will be rolled out to promote economic recovery.

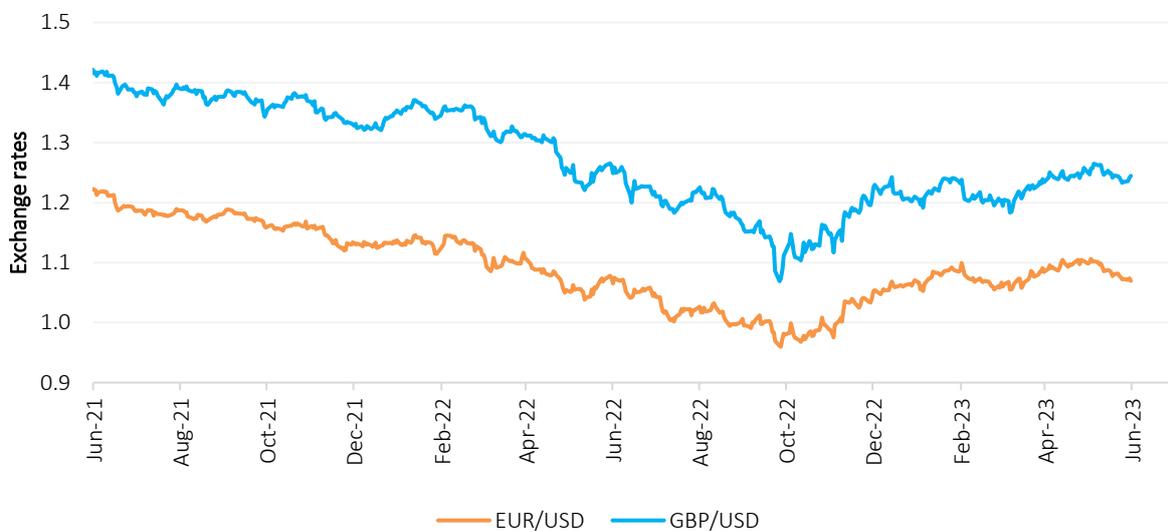
**Figure 7: Interest rates in major central banks**



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

The euro depreciated against the US dollar in June 2023, with the average exchange rate falling to \$1.0847, a 0.2% decrease m-o-m. However, the euro remained 3% higher y-o-y. In contrast, the British pound showed a slight increase in value against the US dollar in June 2023, with the average exchange rate rising to \$1.2638, reflecting a 1% increase m-o-m and 3% increase y-o-y (Figure 8). Inflation in the Euro area continued to decline in June 2023 reaching 5.5% compared to 6.1% in the previous month.

**Figure 8: Exchange rates**



Source: GECF Secretariat based on data from Refinitiv Eikon

## 1.2 Other Developments

*Bonn Climate Change Conference:* The Bonn Climate Change Conference, a pivotal meeting to prepare for the forthcoming COP28, took place from June 5 to 15, 2023, in Bonn, Germany. The conference attracted more than 4,800 participants from across the globe, including representatives from indigenous communities, local populations, businesses, cities, and civil society, youth and children. While progress during the conference was gradual, there were advances on several critically important issues, including preparations for the global stocktake. The global stocktake is a mechanism through which countries and stakeholders can collectively assess progress towards meeting the Paris Climate Change Agreement goals and identify areas where they are falling short. Discussions focused on ways to accelerate collective progress on mitigation, including response measures, adaptation, loss and damage and means of implementation, which encompass climate finance, technology transfer, and capacity building. In early September, the co-facilitators of the technical dialogue will publish a synthesis report, capturing the key findings from the dialogues. This report will include technical information, best practices and lessons learned to help Parties and non-Party stakeholders identify corrective measures needed to achieve the Paris Agreement goals. Another important topic of discussion at the conference was climate finance, notably the provision of adequate and predictable financial support for climate action in developing countries. This included the objective to set a new collective quantified goal on climate finance in 2024.

*Global Conference on Energy Efficiency:* The 8<sup>th</sup> Global Conference on Energy Efficiency, organized by the IEA, took place on June 7-8, 2023, in Versailles, France. The conference brought together over 600 participants from 90 countries, including over 30 ministers and 50 CEOs. The governments represented at the event accounted for 70% of global energy consumption. During the conference, 45 governments from around the world endorsed the objective of doubling the average global rate of energy efficiency improvements by the end of the decade. This commitment aims to foster sustainable economic growth and facilitate the transition to a secure and affordable pathway towards achieving net-zero emissions. Key priorities identified during the conference included digitalization, demand-driven solutions and investments in modernizing electricity grids. The ministers also emphasized the importance of addressing energy poverty and promoting clean cooking solutions. The “Versailles Statement: The Crucial Decade for Energy Efficiency” called upon all parties and stakeholders participating in the COP28 Climate Change Conference to enhance and strengthen the implementation of energy efficiency policies in line with the Paris Agreement.

*Japan:* On June 9, 2023, the Japanese Cabinet Council approved a revision of its official overseas development assistance (ODA) policy, identifying energy security as a key issue for developing countries. This marks the first time in eight years that Japan has revised its Development Cooperation Charter, which outlines its fundamental policy for assisting developing nations. In this new charter, energy security is a central focus, with Japan stating that it will “aggressively” support developing countries by diversifying supply sources and establishing related infrastructure. The revised charter also emphasises assistance programs aimed at promoting green transformation technologies in developing countries to facilitate decarbonisation and energy transition. This aligns with Japan's broader green transformation policy, which seeks to increase public-private investments with the goal of achieving carbon neutrality by 2050. The new charter paves the way for Japan to promote decarbonisation projects, including the

advancement of hydrogen and ammonia technologies. In its pursuit of carbon neutrality, Japan will continue to rely on LNG to ensure energy security.

*Global maritime industry:* The member states of the International Maritime Organisation (IMO) reached a milestone agreement on the decarbonisation of the maritime industry on July 7, 2023. The IMO announced the adoption of new measures, including:

- Target to achieve net-zero emissions of the global shipping industry by or around 2050. This is accompanied by indicative checkpoints of greenhouse gas emissions reductions of at least 20% by 2030 (while striving for 30%), and at least 70% by 2040 (while striving for 80%), all from the baseline set in 2008.
- Development of a global marine fuel standard, which will be utilized in the technical regulation and eventual reduction of the GHG intensity of shipping fuels.
- Creation and launch of a maritime GHG emissions pricing mechanism.

The details of these measures will be developed through the Marine Environment Protection Committee by 2025 and will take effect 16 months after the adoption.

## 2 Gas Consumption

### 2.1 Europe

#### 2.1.1 European Union

In June 2023, the European Union (EU) experienced a 12% year-on-year (y-o-y) decrease in gas consumption, reaching a total of 18 bcm (Figure 9). This decline was primarily due to the growing wind and solar energy output, which led to a decrease in the reliance on gas for electricity generation. In addition, the ongoing implementation of the EU regulation promoting a voluntary 15% reduction in gas demand from 1 April 2023 to 31 March 2024 impacted the gas consumption in the EU. The industrial sector demand has not fully recovered compared to the previous year, despite falling gas prices in Europe during the month.

Gas-based electricity production within the EU fell by 17% y-o-y, while total electricity production decreased by 7% y-o-y, reaching 182 TWh. The decrease in gas-fired power generation was driven by the rising output from other renewable energy sources. Hydro and solar power generation saw substantial growth of 15% and 20% y-o-y, respectively. Additionally, there was a significant decrease of 39% y-o-y (equivalent to 12 TWh) in electricity generation from coal. Electricity generation from nuclear power dropped by 1% y-o-y (Figure 10). Renewables accounted for the largest share of the power mix at 33%, followed by nuclear (23%), gas (18%), hydro (15%) and coal (11%). For H1 2023, hydro, solar, wind and biomass accounted for 45% of the total power generation production in the EU.

In H1 2023, the EU's gas consumption fell by 10% y-o-y, amounting to 178 bcm.

Figure 9: Gas consumption in the EU

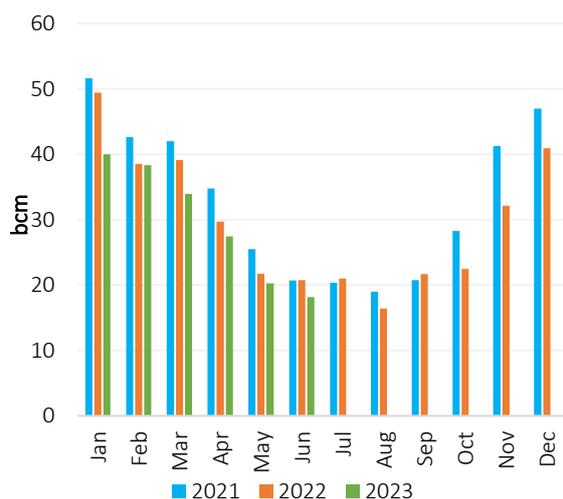
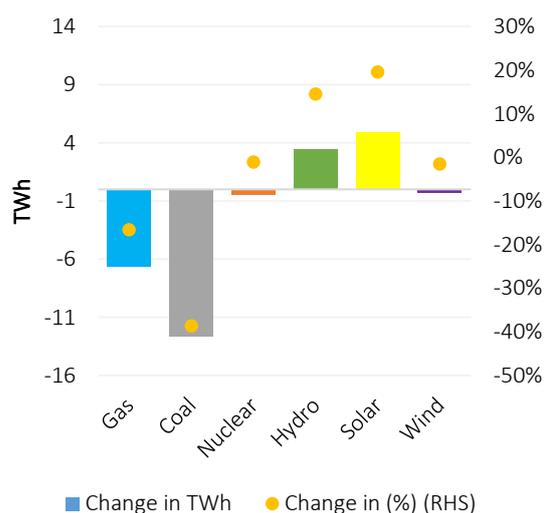


Figure 10: Trend in electricity production in the EU in June 2023 (y-o-y change)



Source: GECF Secretariat based on data from EntsoG and McKinsey

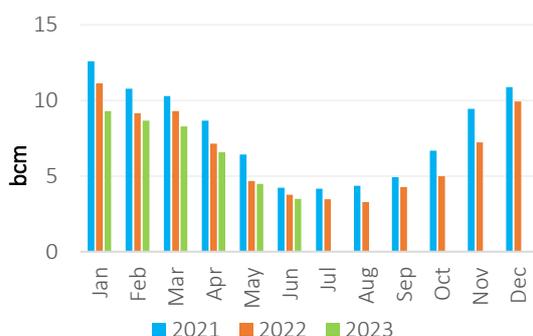
Source: GECF Secretariat based on data from Ember

### 2.1.1.1 Germany

In June 2023, Germany's gas consumption recorded a 7.7% y-o-y decrease, reaching 3.5 bcm (Figure 11). This was attributed to efficient utilization of renewable energy sources because of conducive weather conditions. Renewables, including solar, wind and biomass, represented 55% of the power generation mix in Germany during the month.

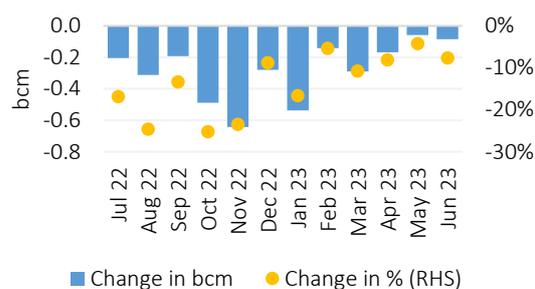
The industrial sector continued its downward trend for thirteen consecutive months, registering an 8% y-o-y decline (Figure 12). Additionally, consumption in the residential/commercial sector decreased by 19% y-o-y due to strict implementation of the EU regulation promoting a voluntary 15% reduction in gas demand. F.

Figure 11: Gas consumption in Germany



Source: GECF Secretariat based on data from Refinitiv

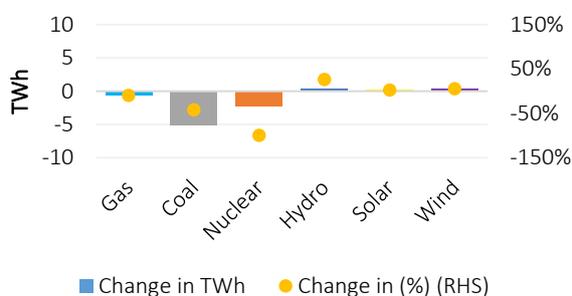
Figure 12: Trend in gas consumption in the industrial sector in Germany (y-o-y change)



Source: GECF Secretariat based on data from Refinitiv

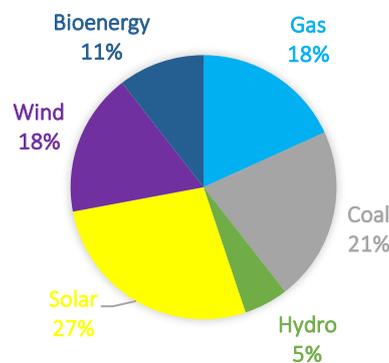
Electricity production from gas witnessed a 3% y-o-y decrease, while total electricity production fell by 16% y-o-y, amounting to 35 TWh. During the same period, there was a notable increase in energy generation from hydro (21% y-o-y), solar (9%), and wind (9%), as weather conditions were favourable for renewable energy use. Consequently, electricity production from coal witnessed a substantial decline of 45% compared to the previous year (Figure 13). Renewables held the dominant position in the energy mix, comprising 56% of the total, followed by coal (21%), gas (18%), and hydro (5%) (Figure 14).

Figure 13: Trend in electricity production in Germany in June 2023 (y-o-y change)



Source: GECF Secretariat based on data from Refinitiv and Ember

Figure 14: German electricity mix in June 2023



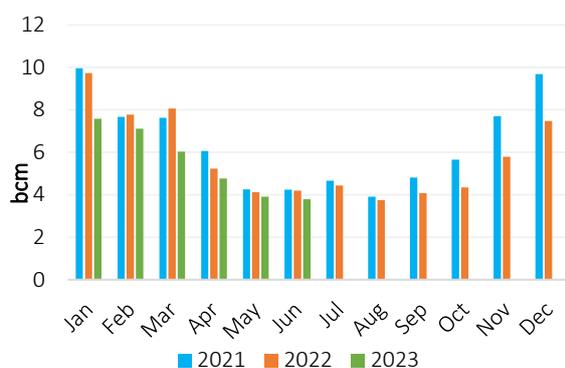
Source: GECF Secretariat based on data from Refinitiv and Ember

For H1 2023, Germany's gas consumption fell by 8.3% y-o-y, reaching 41 bcm.

### 2.1.1.2 Italy

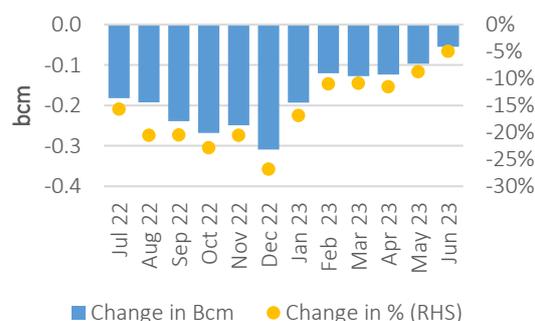
In June 2023, Italy's gas consumption dropped by 10% y-o-y to reach 3.8 bcm (Figure 15). Both the power generation and industrial sectors saw declines of 20% and 6%, respectively, reaching 1.6 bcm and 1 bcm, respectively. This decrease was driven by the high output of hydro due to exceptional precipitation and high solar energy output recorded during the month. For the second month in a row, Italy recorded cumulative rainfall 5% above the 1991-2020 average, representing a total of 101 mm, according to the Arpa report. For the 18<sup>th</sup> consecutive month, gas consumption in the industrial sector saw a y-o-y decline (Figure 16). In contrast, the residential sector recorded the same gas consumption level as last year.

Figure 15: Gas consumption in Italy



Source: GECF Secretariat based on data from Snam

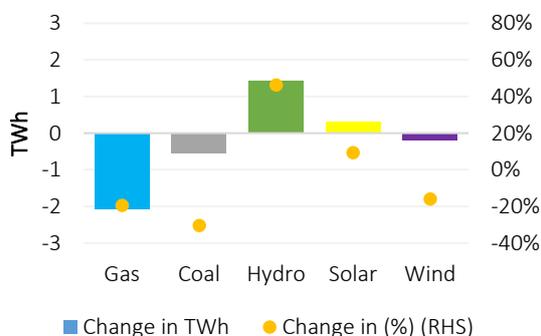
Figure 16: Trend in gas consumption in the industrial sector in Italy (y-o-y change)



Source: GECF Secretariat based on data from Snam

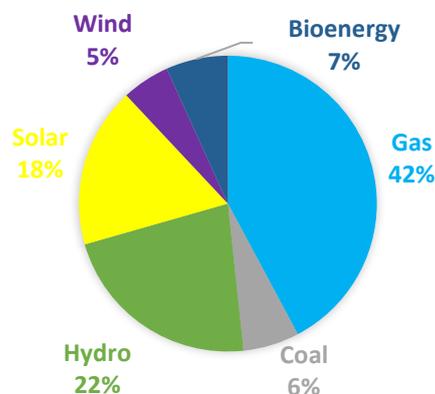
In June 2023, gas-based electricity production witnessed a notable decline of 20% y-o-y, resulting in a total decrease in electricity production of 5.4% y-o-y to reach 20 TWh. In contrast, there was a significant y-o-y increase in energy generation from hydro (46%) and solar (9%) (Figure 17). Despite these changes, gas remained the dominant fuel in the power mix, accounting for 42% of the total, followed by renewables (30%), hydro (22%) and coal (6%) (Figure 18). It is worth noting that since the beginning of 2023, the Italian average total rainfall has nearly returned to the climatic norm with a slight deviation of -4%.

Figure 17: Trend in electricity production in Italy in June 2023 (y-o-y change)



Source: GECF Secretariat based on data from Refinitiv and Ember

Figure 18: Italian electricity mix in June 2023



Source: GECF Secretariat based on data from Refinitiv and Ember

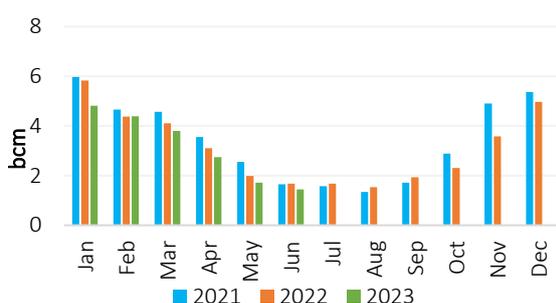
For H1 2023, Italy's gas consumption fell by 15% y-o-y, amounting to 33 bcm.

### 2.1.1.3 France

In June 2023, France's gas consumption declined by 14% y-o-y to reach 1.4 bcm. This marked the fourth consecutive monthly decrease following a temporary rebound observed in February 2023 (Figure 19). This decline was mainly due to reduced usage in the power generation sector due to the recovery in nuclear output compared to the previous year. It is worth noting that in June 23, the French parliament adopted a law to streamline administrative procedures to expedite the construction of new EPR2-type reactors on existing nuclear sites. Furthermore, several measures related to energy planning, the extension of aging power plants (more than 35 years) and nuclear safety and security were addressed.

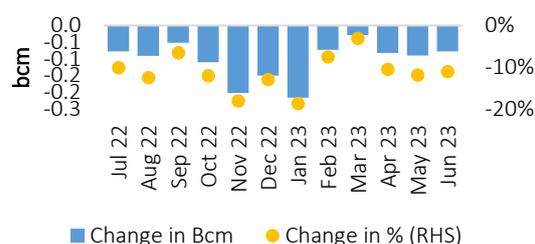
Despite falling gas prices, gas consumption in the industrial sector continued to decline with a drop of 11% y-o-y (Figure 20). The residential sector also experienced a decline of 10% y-o-y due to the implementation of the EU regulation promoting a voluntary 15% reduction in gas demand.

Figure 19: Gas consumption in France



Source: GECF Secretariat based on data from GRTgaz

Figure 20: Trend in gas consumption in the industrial sector in France (y-o-y change)



Source: GECF Secretariat based on data from GRTgaz

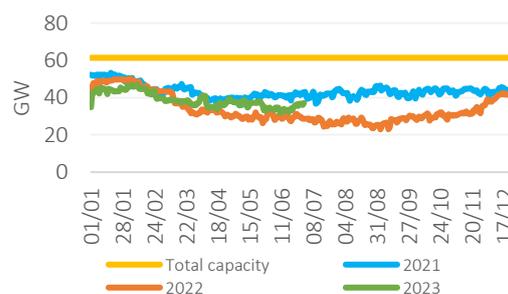
Electricity production from gas witnessed a significant decline of 29% y-o-y, while total electricity production increased by 12% y-o-y, reaching 34 TWh. The month also marked a recovery in electricity generation from nuclear power, increasing by 11% y-o-y. Nuclear capacity availability rose by 16% y-o-y but declined by 9% m-o-m (Figure 22). The upcoming months are expected to see further increases in France's nuclear availability, according to the French EDF utility program forecast. Higher electricity production was recorded from hydro (38% y-o-y), wind (15%) and solar (25%). However, electricity production from coal remained unchanged (Figure 21). Nuclear power continued to hold the dominant position in the energy mix comprising 65% of the total, followed by renewables (15%), hydro (15%), and gas (5%).

Figure 21: Trend in electricity production in France in June 2023 (y-o-y change)



Source: GECF Secretariat based on data from Ember

Figure 22: French nuclear capacity availability



Source: GECF Secretariat based on data from Refinitiv and RTE

For H1 2023, France's gas consumption fell by 10% y-o-y, amounting to 19 bcm.

### 2.1.1.4 Spain

In June 2023, Spain witnessed a 10% y-o-y decline in gas consumption to reach 2.4 bcm. The power generation sector drove the decline with a drop of 24% y-o-y. The decrease in gas consumption was attributed to increased output from solar and hydro energy sources and a reduction in electricity exports to France (Figure 23). In the industrial sector, gas consumption recorded its first growth in 16 months, with a y-o-y increase of 3% (Figure 24).

Figure 23: Gas consumption in Spain

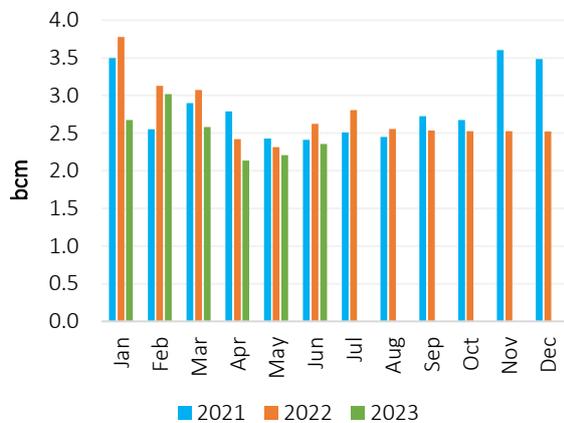
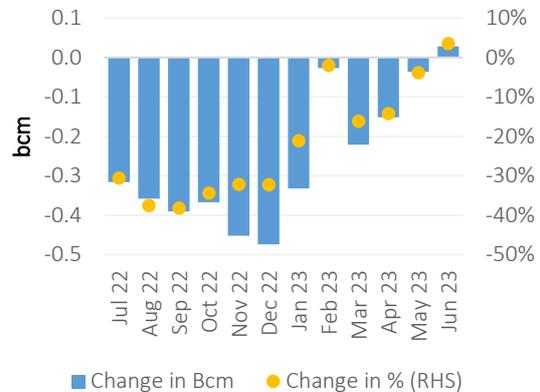


Figure 24: Trend in gas consumption in the industrial sector in Spain (y-o-y change)



Source: GECF Secretariat based on data from Enagas

Electricity production from gas declined by 24% y-o-y, while total electricity production decreased by 11% y-o-y to reach 19 TWh. However, there were notable increases in electricity generation from solar (+17% y-o-y) and hydro (+9%). On the other hand, electricity production from coal, nuclear and wind recorded declines of 62%, 10% and 13%, respectively (Figure 25). Renewables held the dominant position in the power mix accounting for 40% of the total, followed by gas (29%), nuclear (21%), hydro (8%), and coal (2%) (Figure 26).

Figure 25: Trend in electricity production in Spain in June 2023 (y-o-y change)

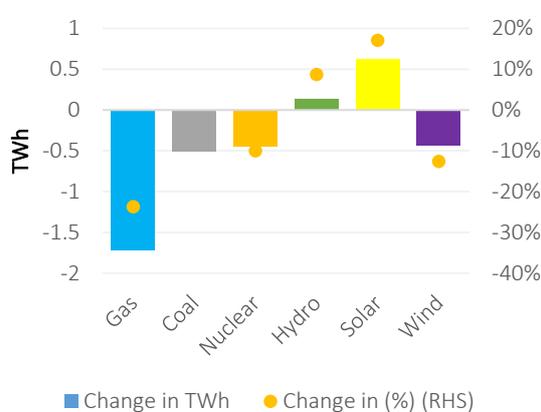
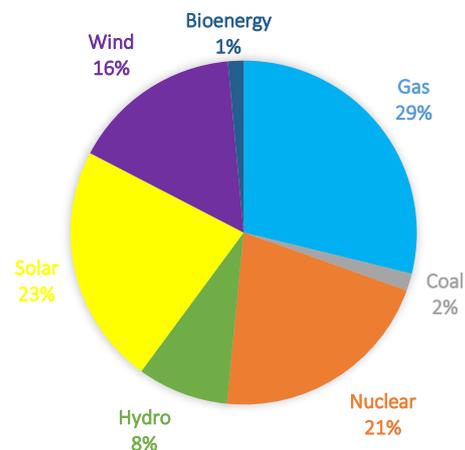


Figure 26: Spanish electricity mix in June 2023



Source: GECF Secretariat based on data from Ember and Ree

Source: GECF Secretariat based on data from Ember and Ree

For the first half of the year 2023, Spain's gas consumption fell by 14% y-o-y, amounting to 15 bcm.

## 2.1.2 United Kingdom

In June 2023, gas consumption in the UK fell by 21% y-o-y, reaching 2.9 bcm (Figure 27). This decline was largely due to gas consumption declines in the industrial, residential and power generation sectors, which decreased by 37%, 25% and 15% y-o-y, respectively. The gas consumption decline in the power generation sector was driven by higher solar output during the month. The industrial sector also experienced a drop of 0.2 bcm in gas consumption, despite falling natural gas prices. The residential sector recorded consumption of 1.6 bcm in June 2023 (Figure 28).

Figure 27: Gas consumption in the UK

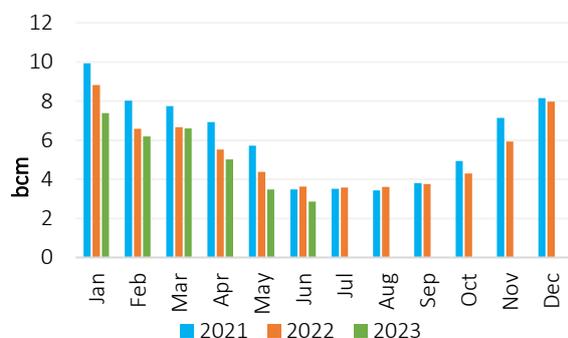
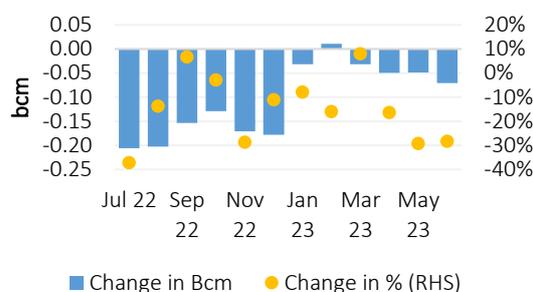


Figure 28: Trend in gas consumption in the industrial sector in the UK (y-o-y change)



Source: GECF Secretariat based on data from Refinitiv

Source: GECF Secretariat based on data from Refinitiv

The UK's electricity production from gas decreased by 21% y-o-y, while total electricity production fell by 17% y-o-y, reaching 23 TWh. Solar power generation increased by 15% y-o-y. However, electricity production from nuclear, hydro and wind declined by 20%, 63% and 19% y-o-y, respectively (Figure 29). Gas emerged as the dominant energy source in the power mix with a share of 45% of the total, followed by renewables (34%), nuclear (20%) and hydro (1%) (Figure 30).

Figure 29: Trend in electricity production in UK in June 2023 (y-o-y change)

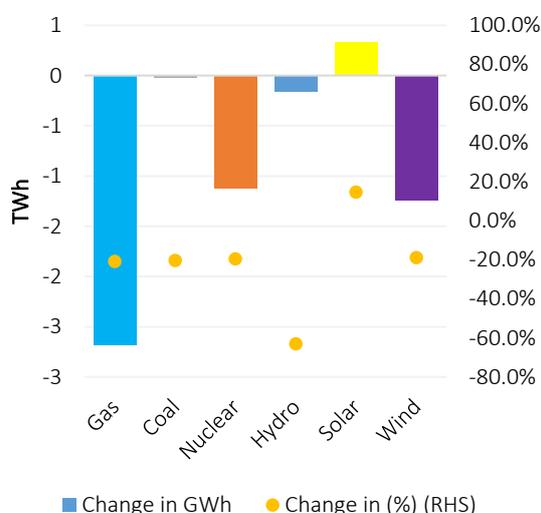
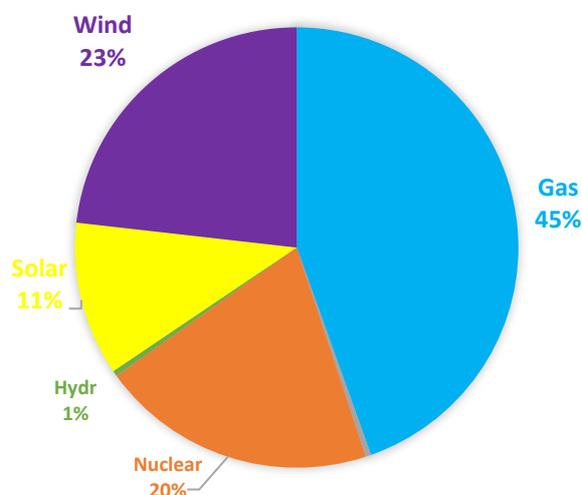


Figure 30: UK electricity mix in June 2023



Source: GECF Secretariat based on data from Refinitiv

Source: GECF Secretariat based on data from Refinitiv

For H1 2023, gas consumption in the UK declined by 4 bcm, or 11% y-o-y to reach 31.5 bcm.

## 2.2 Asia

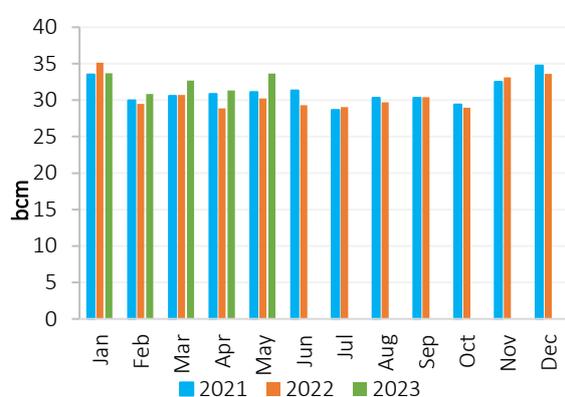
### 2.2.1 China

In May 2023, China's apparent gas demand, which includes pipeline imports, LNG imports, and domestic production, rose by 11% y-o-y, reaching 34 bcm. China's increase in natural gas consumption is primarily attributed to the rebound in economic activity following the stringent COVID-19 lockdown measures implemented in 2022, and the increased utilization of natural gas in the power sector due to reduced hydroelectric availability (-32% y-o-y) and heightened cooling demand, mainly in the southern part of the country (Figure 31).

Electricity production from gas increased by 17% y-o-y, while total electricity production rose by 8% y-o-y, reaching 727 terawatt-hours (TWh). During the month, there was a surge in electricity generation from coal (+17% y-o-y), nuclear (+6%), solar (+14%) and wind (+28%) (Figure 32). Coal remained the dominant fuel in the power mix, accounting for 61% of the total, followed by renewables (20%), hydro (11%), nuclear (5%), and gas (3%).

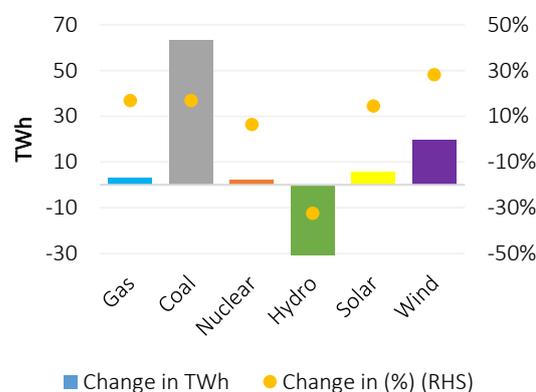
From January to May 2023, China's gas consumption increased by 5% y-o-y to 162 bcm.

Figure 31: Gas consumption in China



Source: GECF Secretariat based on data from Refinitiv

Figure 32: Trend in electricity production in China in May 2023 (y-o-y change)



Source: GECF Secretariat based on data from Ember

### 2.2.2 India

In May 2023, India's gas consumption marked its fifth consecutive month of growth with a 10% y-o-y increase, reaching 5.4 bcm (Figure 33). The share of regasified LNG in India's gas supply fell to 49%. The fertilizer sector accounted for the largest share of gas consumption at 33%, followed by city gas (20%), power generation (14%), refining (9%) and the petrochemical sector (5%) (Figure 34).

The increase in gas consumption in India was driven by the power generation sector, which experienced a growth of 15% y-o-y. This rise can be attributed to above-average temperatures recorded in India during the month, which boosted cooling demand. This rise in gas consumption is expected to continue in June due to the ongoing heatwave in India.

Figure 33: Gas consumption in India

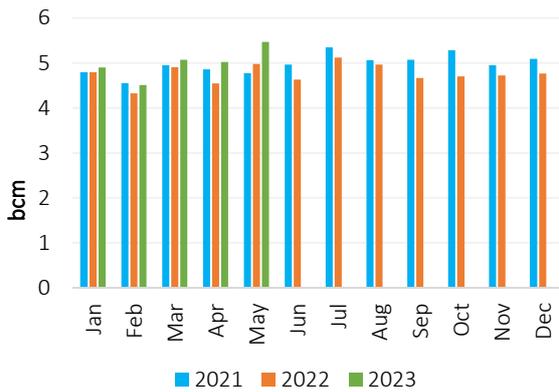
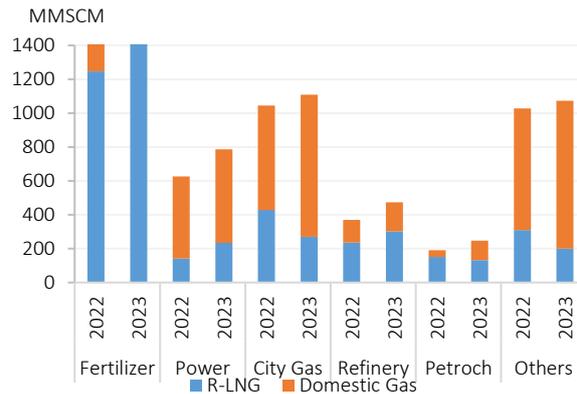


Figure 34: India's gas consumption by sector



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

From January to May 2023, India's total gas consumption increased by 6% y-o-y to 25 bcm.

### 2.2.3 Japan

In June 2023, Japan's gas consumption decreased by 9% y-o-y, totalling 7 bcm (Figure 35). This decrease can be primarily attributed to the higher availability of nuclear power, which has significantly improved by 150% compared to the same period last year. It is worth noting that June 2022 was the least productive month in terms of nuclear output during 2022. Gas consumption in the power generation sector decreased by 14% y-o-y. The city gas sector also recorded a decline of 1.6% compared to last year. Furthermore, Japan's Heating Degree Days (HDD) averaged 3.4 during the month, indicating a 9% y-o-y decline (Figure 36).

For H1 2023, gas consumption in Japan decreased by 9% y-o-y to reach 48 bcm.

Figure 35: Gas consumption in Japan

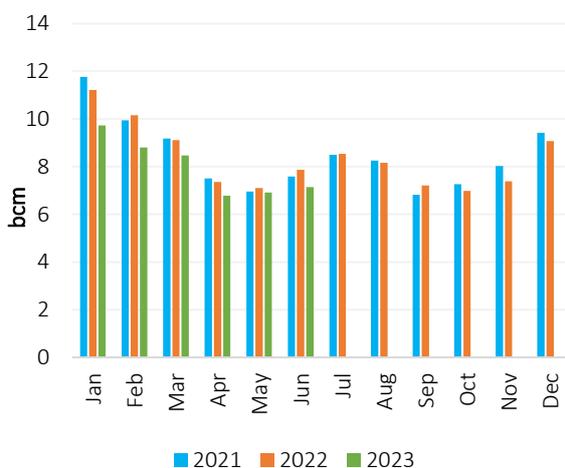
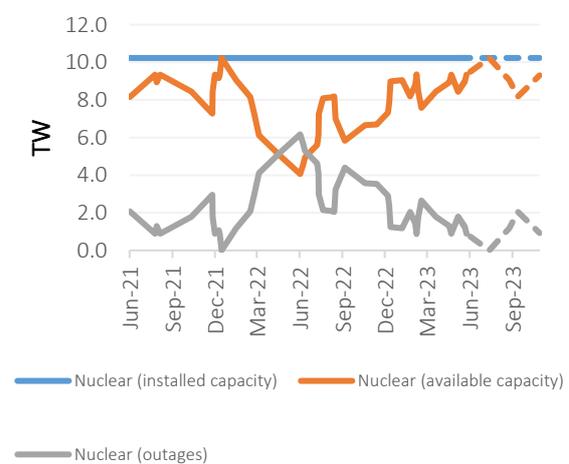


Figure 36: Nuclear availability in Japan



Source: GECF Secretariat based on data from Refinitiv

Source: GECF Secretariat based on data from Refinitiv

## 2.2.4 South Korea

In June 2023, South Korea witnessed a 9% y-o-y decrease in gas consumption, totalling 3.4 bcm. This decline was primarily driven by a 20% reduction in gas use in the residential sector. Gas consumption in the power generation sector also decreased by 7.7% y-o-y, largely due to increased output from coal-based sources as a result of KOGAS setting a higher tariff and making coal power generation more competitive than natural gas (Figure 37). Moreover, the anticipated higher solar output during the summer months is expected to affect the share of natural gas in the power generation mix. South Korea's Heating Degree Days (HDD) averaged 2.6 in June, down by 0.3% y-o-y (Figure 38).

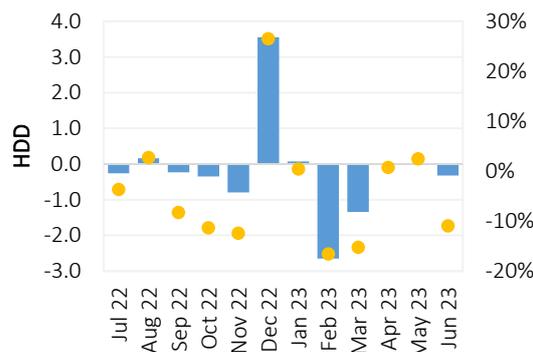
For H1 2023, gas consumption in South Korea decreased by 9% y-o-y to reach 28 bcm.

Figure 37: Gas consumption in South Korea



Source: GECF Secretariat based on data from Refinitiv

Figure 38: HDD in South Korea (y-o-y change)



Source: GECF Secretariat based on data from Refinitiv

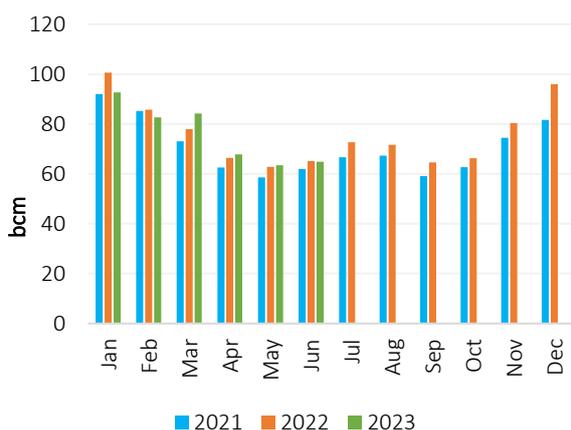
## 2.3 North America

### 2.3.1 US

In June 2023, US gas consumption remained at the same level as the previous year at 65 bcm (Figure 39). The residential sector witnessed a 24% y-o-y increase while power generation matched the previous year's level at 32 bcm. This was due to the increased utilization of gas in the sector as a result of higher coal-to-gas switching and lower wind output. Additionally, the industrial sector witnessed a modest y-o-y growth of 0.2% in gas consumption. In contrast, gas consumption in the commercial sector declined by 10% y-o-y.

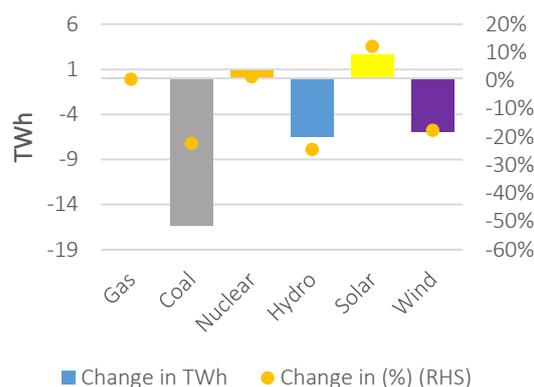
Electricity production from gas rose by 0.1% y-o-y, while total electricity production decreased by 5.3%. The month saw a decrease in electricity generation from coal (-22% y-o-y), hydro (-25%) and wind (-18%). However, there was higher production from nuclear (1.4% increase y-o-y) and solar (12% increase y-o-y) (Figure 40). Gas remained the dominant fuel in the power mix with a share of 44%, followed by nuclear (18%), renewable energy sources (16%), coal (16%) and hydro (6%).

Figure 39: Gas consumption in the US



Source: GECF Secretariat based on data from EIA and Refinitiv

Figure 40: Electricity production in the US in June 2023 (y-o-y change)



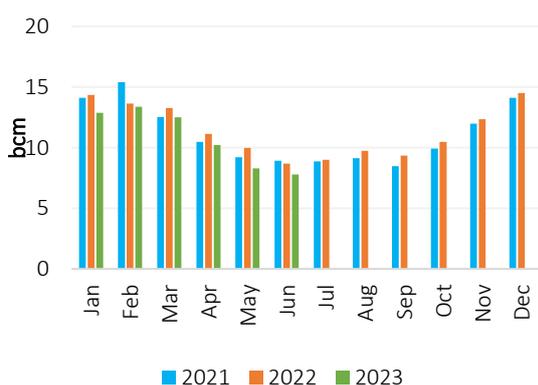
Source: GECF Secretariat based on data from Ember and Refinitiv

For H1 2023, gas consumption in US decreased by 0.7% y-o-y to reach 456 bcm.

### 2.3.2 Canada

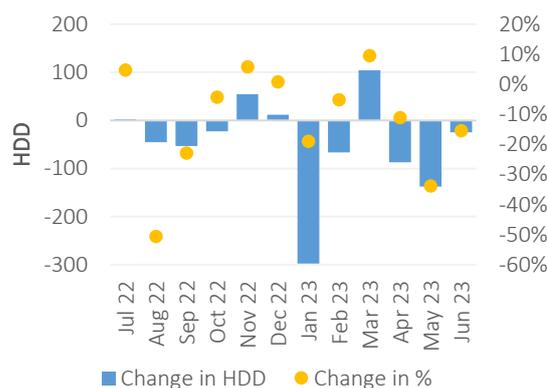
In June 2023, Canada's gas consumption declined by 10% y-o-y to 7.8 bcm (**Error! Reference source not found.**). This was primarily attributed to reduced gas consumption in the industrial/power generation, residential and commercial sectors, which fell by 8%, 12% and 35% y-o-y, respectively.

Figure 41: Gas consumption in Canada



Source: GECF Secretariat based on data from Refinitiv

Figure 42: HDD in Canada (y-o-y change)



Source: GECF Secretariat based on data from Refinitiv

For H1 2023, gas consumption in Canada decreased by 8% y-o-y to reach 65 bcm.

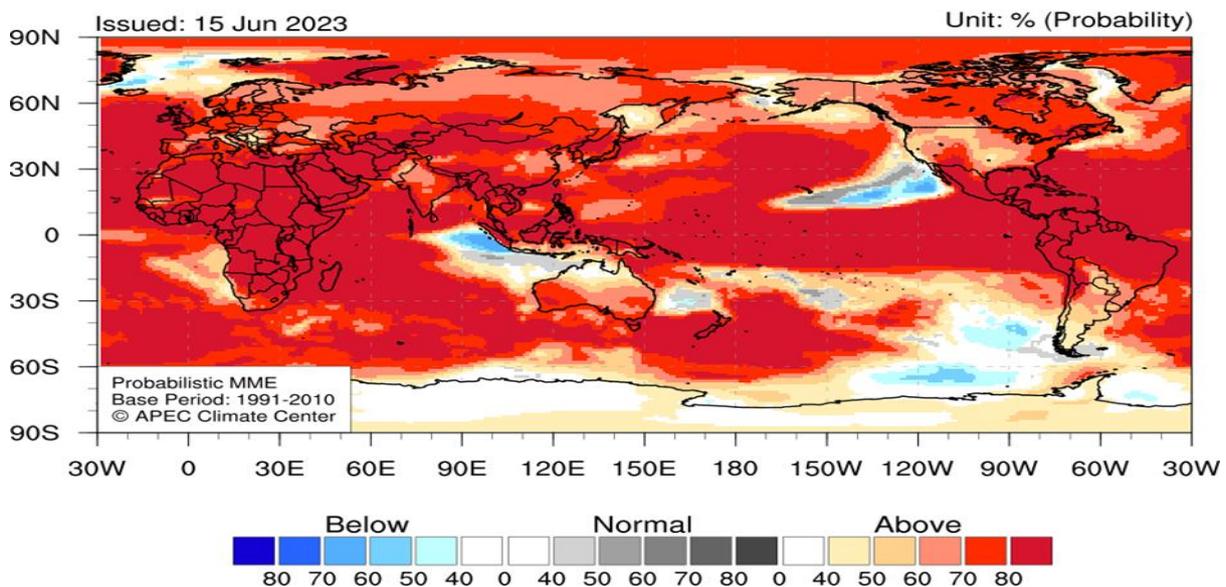
### 2.4 Weather Forecast

The weather and precipitation conditions have a significant impact on gas consumption. Below normal temperatures in winter and above normal temperatures in summer boost heating and cooling demand, respectively. Additionally, below normal precipitation levels result in lower hydro output, which can potentially increase gas demand in the power generation sector.

### 2.4.1 Temperature Forecast for July to September 2023

According to the APEC Climate Center Climate Outlook published on June 15, 2023 (Figure 43), strongly enhanced probability for above normal temperatures is predicted for most of the globe (excluding the eastern Indian Ocean, northern Australia, the eastern subtropical North Pacific, south-eastern South Pacific and the Antarctic) for the period July to September 2023.

Figure 43: Temperature forecast July to September 2023

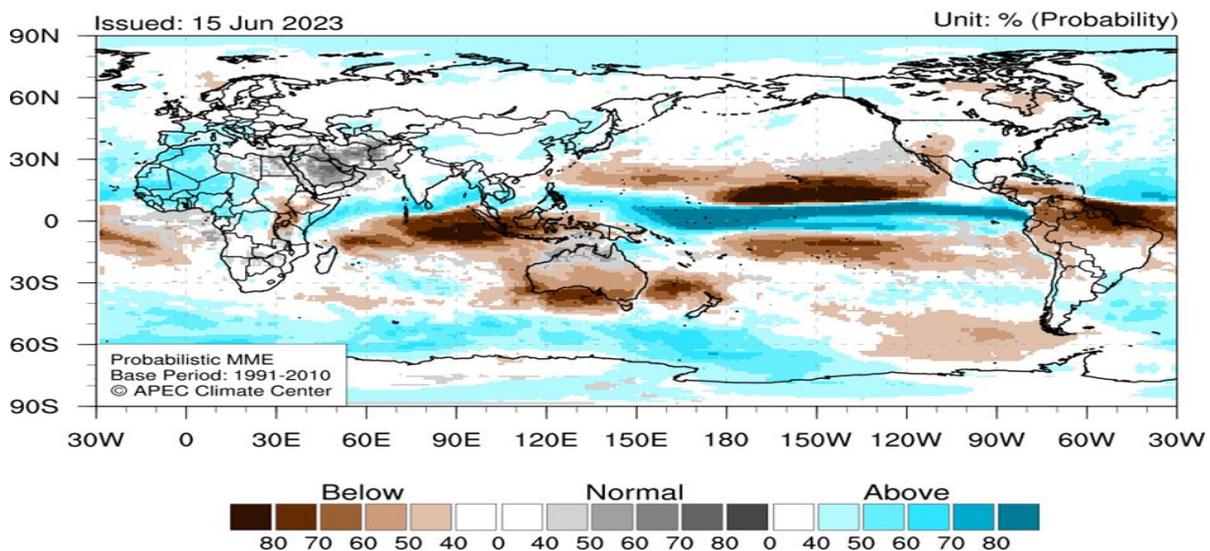


Source: APEC Climate Center

### 2.4.2 Precipitation Forecast for July to September 2023

According to the APEC Climate Center Climate Outlook published on June 15, 2023 (Figure 44), above normal precipitation is expected for northern and western Africa, subtropical North Atlantic and equatorial Pacific, while below normal precipitation is expected for central off-equatorial Pacific, tropical Atlantic near South America, eastern Indian Ocean and the Great Australian Bight for the period July to September 2023.

Figure 44: Precipitation forecast July to September 2023



Source: APEC Climate Centre

### 3 Gas Production

#### 3.1 Global

Preliminary data indicates a minor rise in global gas production by 0.1% in 2022, reaching a total production figure volume of 4,037 bcm. This uptick was mainly due to increased output from North America and the Middle East. Conversely, regions such as the CIS and Africa saw their gas production volumes decrease in the same timeframe (Table 3). Updated information from the preceding month has resulted in a downward revision of the 2022 global gas production estimates.

Forecasts for 2023 suggest a revival in global gas production, with a projected rise of 1.6%. Africa, LAC, the Middle East and North America are expected to spearhead this expansion, while other areas might maintain their production levels or potentially experience a decline. Non-GECF countries are forecasted to augment their gas production by 3.3%, achieving a total output of 2,424 bcm. The United States is anticipated to be the primary driver of this surge, with an increase of 44 bcm compared to the previous year.

**Table 3: Global gas production forecast by region (bcm)**

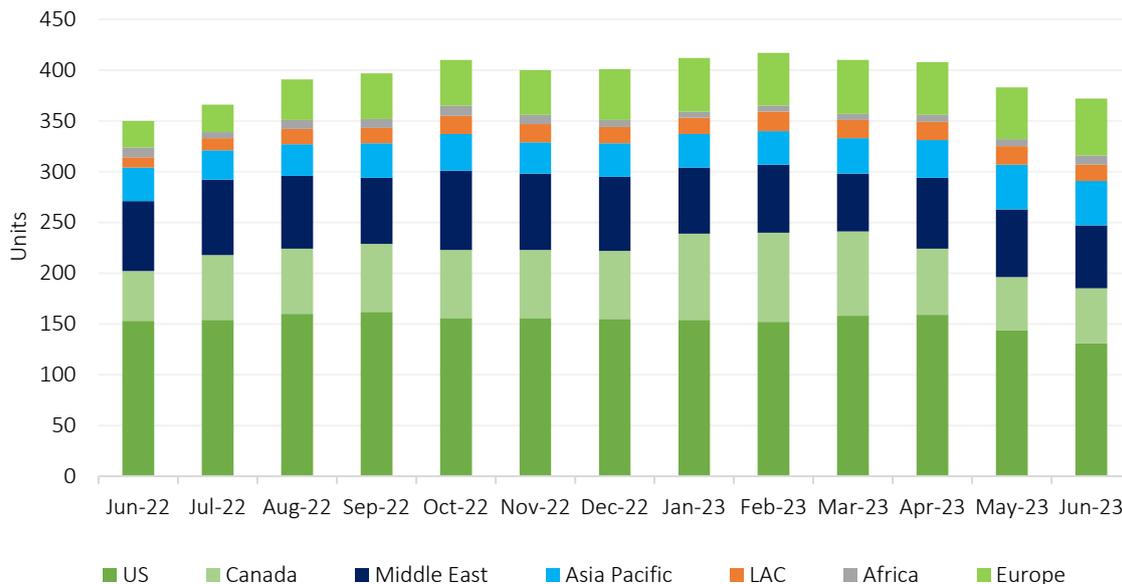
Region	2021	2022	2022 Revision*	2023	2023 Revision*
Africa	264	261	0.0%	265	-0.1%
Asia Pacific	651	659	0.3%	657	0.9%
CIS	909	832	0.0%	814	0.5%
LAC	150	153	-1.4%	160	-2.1%
Europe	225	232	-0.5%	225	-2.0%
Middle East	670	685	-0.3%	702	-1.5%
North America	1165	1215	-0.1%	1279	0.6%
<b>World</b>	4033	4037	-0.12%	4102	0.0%
<b>GECF</b>	1757	1692	0.1%	1678	-0.4%
<b>non-GECF</b>	2276	2346	-0.3%	2424	0.2%

Source: GECF Secretariat based on Rystad Energy Ucube

\*Revision for 2022 and 2023 global gas production compared to the previous estimation

In June 2023, the global gas rig count, an indicator of upstream activity, declined by 11 units m-o-m but surged by 22 units y-o-y, culminating in a total of 372 units (Figure 45). Europe, Africa and Canada observed a rise in active gas rigs by 5, 2 and 2 units, respectively. On the other hand, the US, Middle East and Latin America experienced a decrease in gas rig count by 13, 5 and 2 units, respectively. The count of active rigs in the Asia Pacific region remained the same as the previous month.

Figure 45: Trend in monthly global gas rig count



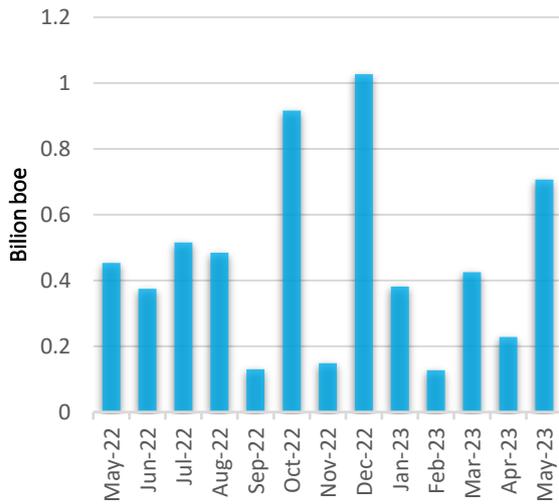
Source: GECF Secretariat based on data from Baker Hughes  
 Note: Excludes data for Eurasia and Iran

In May 2023, the total volume of gas and liquids discovered amounted to 707 million barrels of oil equivalent (boe). Of this, gas accounted for 16% (20 bcm), while oil constituted the remaining 84% (594 million boe). This marked an increase compared to the 228 million boe discovered in April 2023 and the 453 million boe discovered in May 2022, resulting in an average monthly discovery of 412 million boe in 2023 (Figure 46). The cumulative volume of discoveries from January to May 2023 reached 2 billion boe, compared to discovered volumes of 2.8 and 3.8 billion boe for the same period in 2021 and 2022, respectively. The reduced discovered volumes so far in 2023 reflect the challenges facing global exploration activity. Most of the new discovered volumes in 2023 were liquids, accounting for 76% of the discoveries. Additionally, offshore discoveries represented approximately 55% of the total discoveries

In May 2023, 14 new discoveries were announced, 9 of which were offshore. Europe, LAC and Africa accounted for 67%, 13% and 11% of the discovered volumes, respectively. Turkey, Guyana, Namibia and Norway stood out with approximately 400, 360, 300 and 250 million boe discovered, respectively. No significant discoveries were reported in Eurasia and the Middle East (Figure 47).

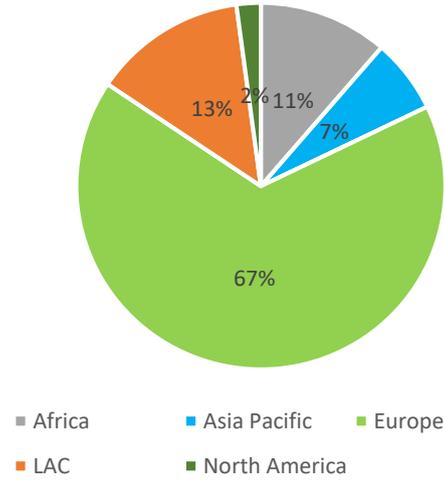
The Mukuyu onshore gas discovery in Zimbabwe was the largest and most significant gas discovery announced in May 2023. The Mukuyu-1 exploration well in the Rufunsa Basin encountered 13 potential hydrocarbon bearing zones with approximately 225m of gross hydrocarbons column. Rystad Energy estimated the discovery holds 65 million boe of recoverable resources. This is that the first significant hydrocarbon discovery in Zimbabwe and made it to join the list of eleven countries that saw hydrocarbon finds for the first time since 2000.

**Figure 46: Monthly gas and liquid discovered volumes**



Source: GECF Secretariat based on Rystad Energy Ucube

**Figure 47: Discovered volumes in May 2023 by region**

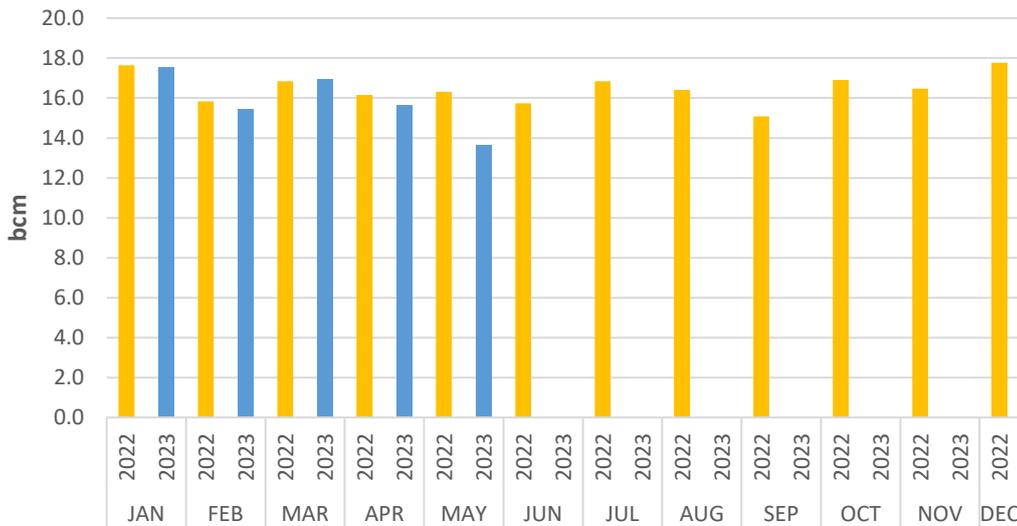


Source: GECF Secretariat based on Rystad Energy Ucube

### 3.2 Europe

In May 2023, gas production in Europe declined by 16.3% y-o-y, leading to a total output of 13.7 bcm (Figure 48). This decrease was mainly due to lower production from the region's leading producers, including Norway, the UK and the Netherlands. Annual production for 2023 is projected to contract by 7 bcm compared to the previous year, predominantly due to a decrease in production from Norway, the UK, and the Netherlands.

**Figure 48: Europe's monthly gas production**



Source: GECF Secretariat based on data from Refinitiv, and Norwegian Petroleum Directorate

\*Europe's production: UK, the Netherlands, Norway, Germany, Italy, Poland, Denmark, Austria and Romania

In a major development in European gas production, NewMed Energy Company announced that Aphrodite offshore gas field in Cyprus will be linked to the existing production and processing facilities in Egypt. The field, located approximately 170km off the Cypriot coast, is estimated to hold approximately 124 bcm of recoverable resources. Moreover, the field partners (NewMed, Chevron and Shell) announced the drilling of appraisal well A3 to confirm the estimations of the field reserve volumes.

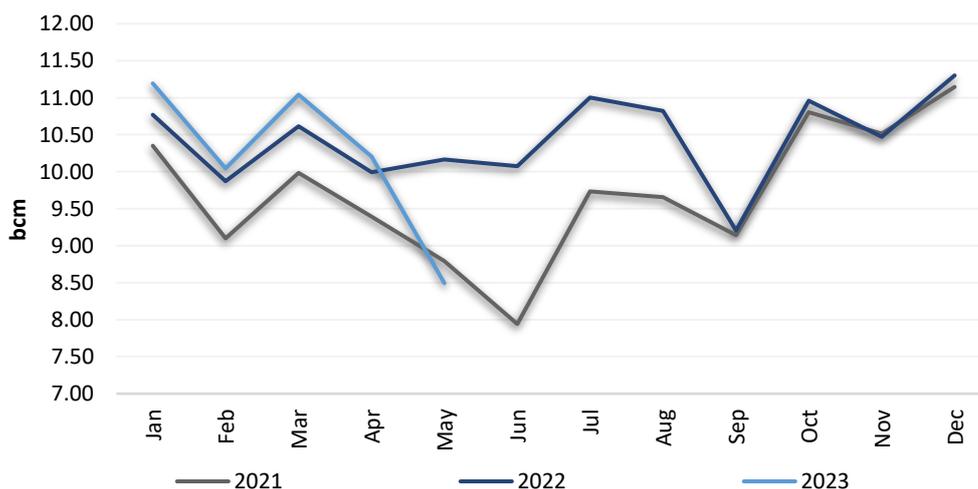
### 3.2.1 Norway

Based on preliminary data from the Norwegian Petroleum Directorate, Norway's gas production decreased by 17% y-o-y, amounting to 8.5 bcm in May 2023 (Figure 49). The cumulative gas production for the first quarter of 2023 was reported to be 51 bcm.

As a result of a positive news from exploration well Øst Frigg Beta/Epsilon, Aker BP increased its reserves estimates by 10% to a range between 53 to 90 million boe. The Øst Frigg Beta/Epsilon well, drilled by the semi-submersible rig Scarabeo 8, is the longest exploration well drilled in the Norwegian continental shelf so far.

Concerning maintenance activities, Shell announced that the maintenance outage in the Nyhamna gas processing plant would take at least one month longer than originally envisaged because of problems in the plant's cooling system. Nyhamna gas processing plant is one of Northern Europe's largest processing facilities, with export capacity of about 29.5 bcma. It processes gas from the Ormen Lange and Aasta Hansteen fields. The plant is scheduled to resume production in mid of July.

Figure 49: Trend in gas production in Norway



Source: GECF Secretariat based on data from Refinitiv and Norwegian Petroleum Directorate

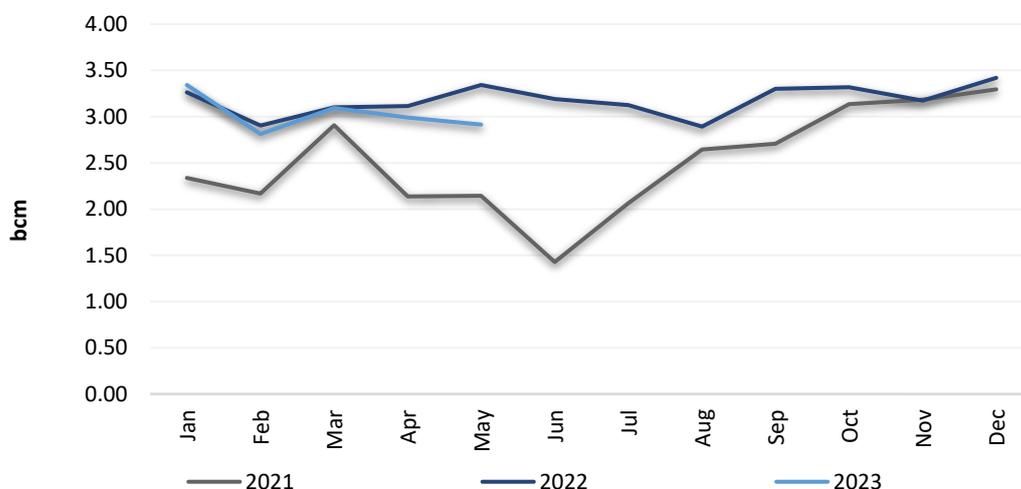
### 3.2.2 UK

UK's gas production declined by 13% y-o-y, amounting to 2.91 bcm in May 2023. The total gas production for the period from January to May 2023 totalled 15.15 bcm, indicating a 4% y-o-y decrease (Figure 50).

Shell is working on boosting its gas production levels in the UK by finalizing the development plan of the recently acquired Victory gas field, located in the Block 207/1a, northwest of the Shetland Isles and approximately 17 km from the closest pipeline infrastructure. The preliminary

development plan estimated a 0.7 bcma annual production from the field, with a cumulative production of 3.6 bcm of gas through the 8-year lifetime of the field. First gas production is expected in 2026, with the produced gas to be sent to the nearby Great Lagaan field.

Figure 50: Trend in gas production in the UK

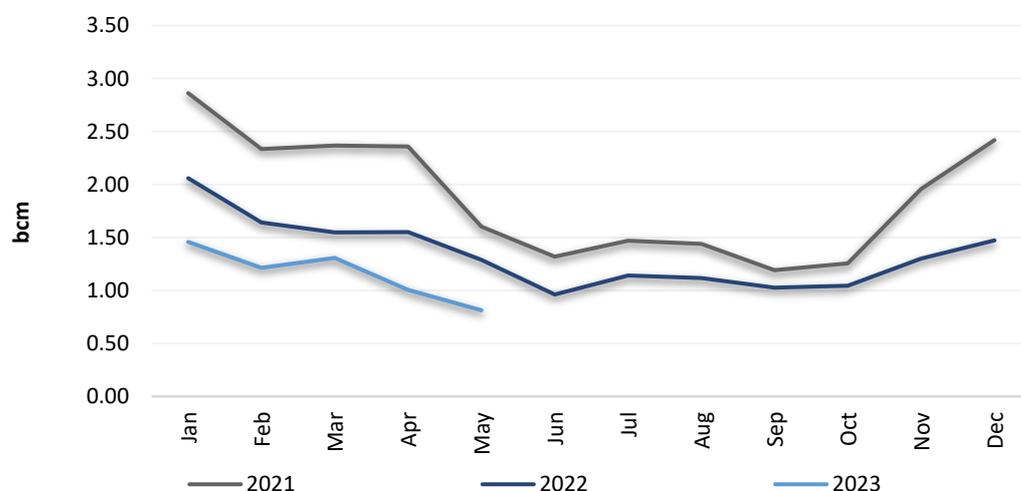


Source: GECF Secretariat based on data from Refinitiv

### 3.2.3 Netherlands

In May 2023, total gas production in the Netherlands amounted to 0.81 bcm, indicating a y-o-y decline of 37% (Figure 51). This reduction aligns with the Dutch government's reaffirmed strategy of halting production from the Groningen field by October 2023. In April 2023, gas production from the Groningen field was 0.06 bcm, compared to 0.7 bcm in April 2022, representing a minor production level.

Figure 51: Trend in gas production in the Netherlands



Source: GECF Secretariat based on data from Refinitiv, Dutch Central Bureau of Statistics

### 3.3 Asia

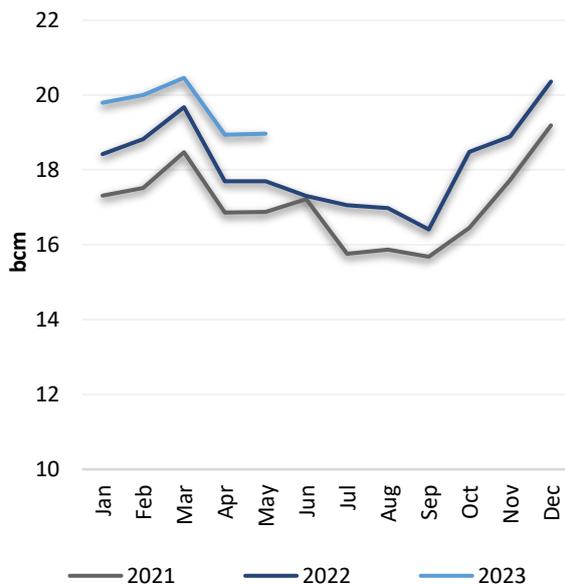
Preliminary data from the National Bureau of Statistics shows that China's gas production rose by 7% y-o-y to hit 18.97 bcm in May 2023 (Figure 52). Additionally, the aggregate gas production from January to May witnessed a 6.3% increase, amounting to 98.17 bcm. In the same month, China's coal-bed methane (CBM) output stood at 1.09 bcm.

According to the latest data from Argus and the Chinese Ministry of Natural Resources, China's proven gas reserves rose by 3.6% (230 bcm) in 2022 to reach 6.6 tcm compared to the level of 6.37 tcm in 2021, a 3-fold increase compared to the increase in proven reserves in 2021, which stood at 73 bcm. Shale gas reserves, located in the western Chinese area of Sichuan, rose to 561 bcm, a 16 bcm increase compared to 2021. Coal bed methane (CBM) gas reserves were the same in 2022 compared to 2021.

PetroChina announced the start of drilling operations for Taco 1, the deepest onshore oil and gas well in the Tarim basin in northwest Xinjiang. The well is planned to reach a depth of 11000m, making China the third country worldwide to drill onshore wells of more than 10000m in depth, according to PetroChina. It is noteworthy to highlight that ultra-deep oil and gas resources in China account for about one third of the country's total hydrocarbon resources which are mainly located in the four major basins of Tarim, Junggar, Sichuan and Qaidam.

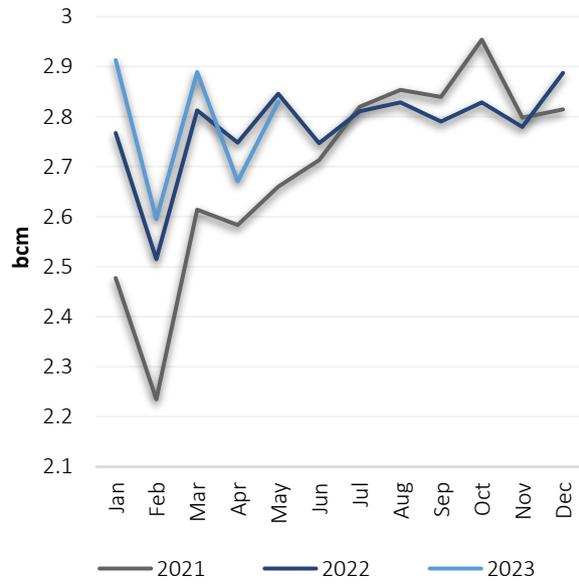
In May 2023, India's gas production witnessed a decline of 1% y-o-y, amounting to 2.83 bcm (Figure 53). The cumulative gas production for the period from January to May 2023 was 13.9 bcm, similar to the previous year.

Figure 52: Trend in gas production in China



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

Figure 53: Trend in gas production in India



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

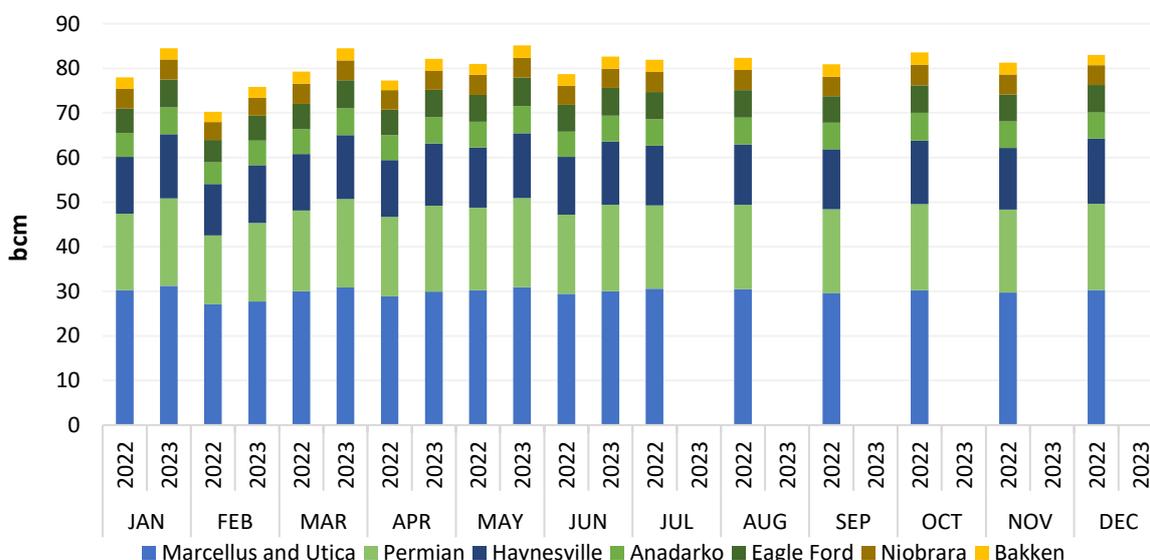
### 3.4 North America

#### 3.4.1 US

In June 2023, the production of shale gas from the seven major US regions of Anadarko, Appalachian, Bakken, Eagle Ford, Haynesville, Niobrara and Permian, witnessed a y-o-y increase of 5%, amounting to a total production of 82.6 bcm (Figure 54). The Appalachian region, home to the Marcellus and Utica shale plays, accounted for the larger portion, making up 36% of the total production.

It is worth highlighting that the Permian shale play, which extends across western Texas and eastern New Mexico, achieved record-high natural gas production levels in 2022, according to the latest data from the EIA Drilling Productivity Report. The average production in 2022 reached 219 bcm, a 14% increase compared to 2021. Moreover, the Permian monthly production has been steadily increasing through the first five months of 2023, reaching 19.4 bcm or 23% of the total shale gas production, reflecting a 9% increase from the previous year.

Figure 54: Trend in shale gas production in the US shale oil/gas producing regions



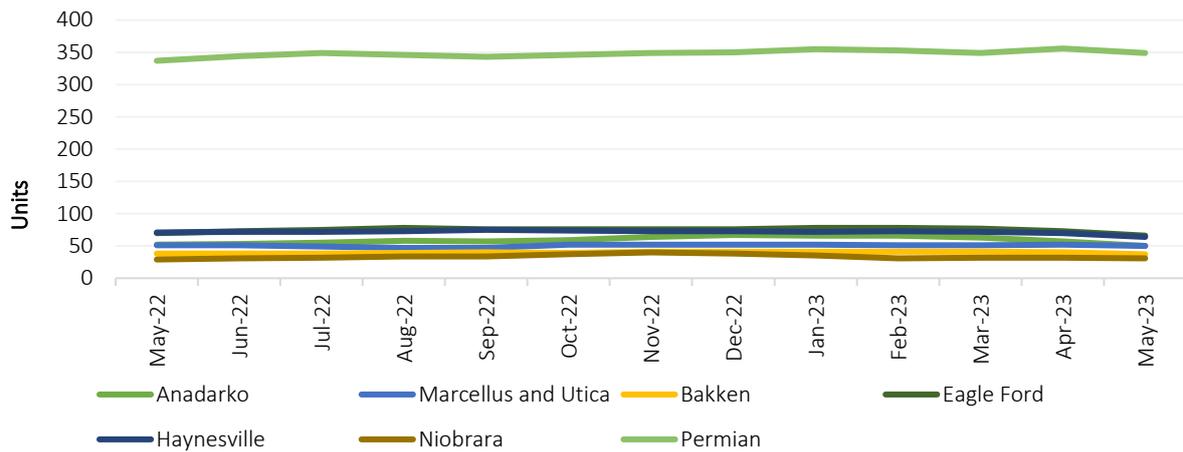
Source: GECF Secretariat based on data from Refinitiv, EIA

In May 2023, the total count of oil and gas rigs in the seven key shale oil and gas producing regions in the US was 647,, a decrease of 33 units from April 2023 and a 1-unit decrease compared to May 2022 (Figure 55).

In addition, the seven key US shale oil and gas regions had 4,834 drilled but uncompleted (DUC) wells in May 2023, a decrease of 30 wells compared to the previous month (Figure 56).

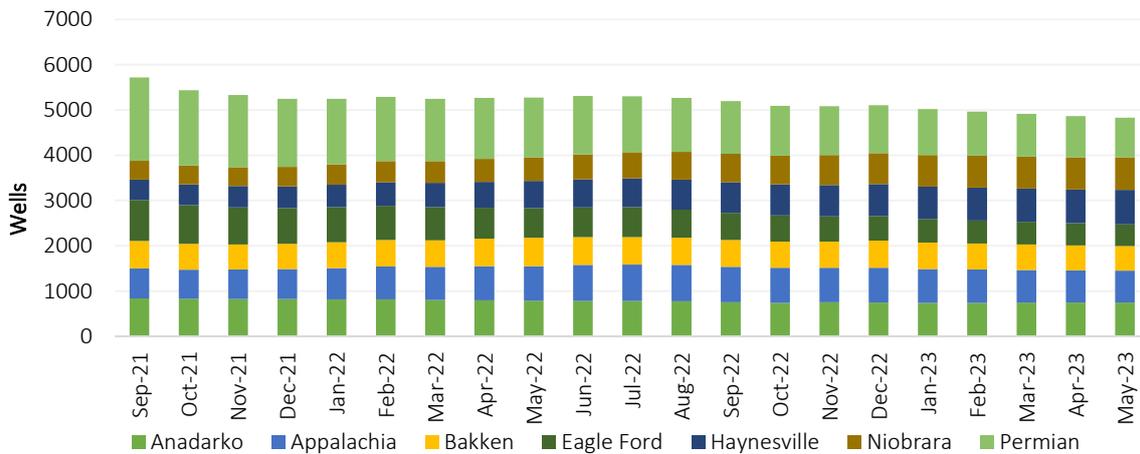
EIA’s Drilling Productivity Report also highlights that gas production per rig in the seven major shale oil and gas regions experienced a decline in June 2023, dropping to 5,255 thousand cubic feet per new well, marking a 0.2% m-o-m decrease and 12.5% y-o-y decrease (Figure 57).

Figure 55: US shale region oil and gas rig count



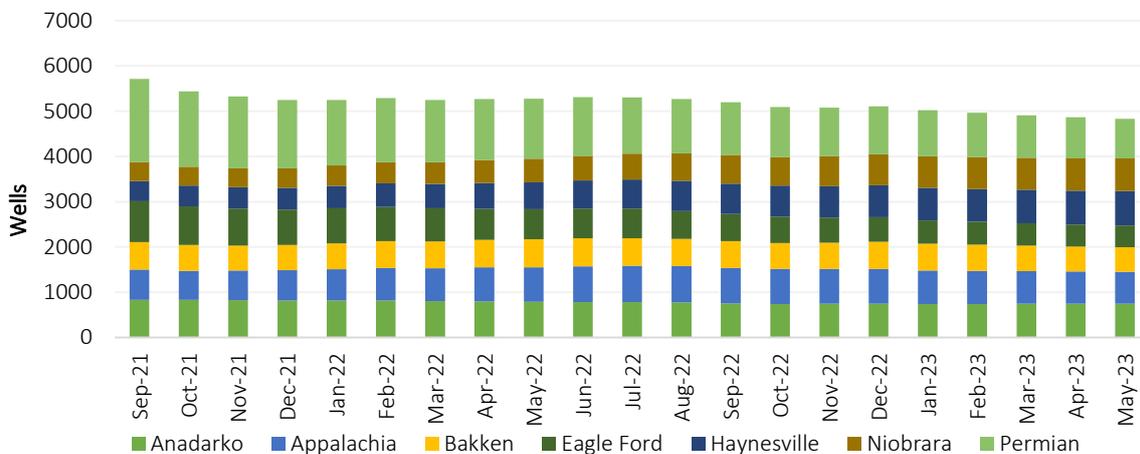
Source: GECF Secretariat based on data from Refinitiv

Figure 56: Drilled but uncompleted well (DUCs) counts in the US



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

Figure 57: New-well gas production per rig

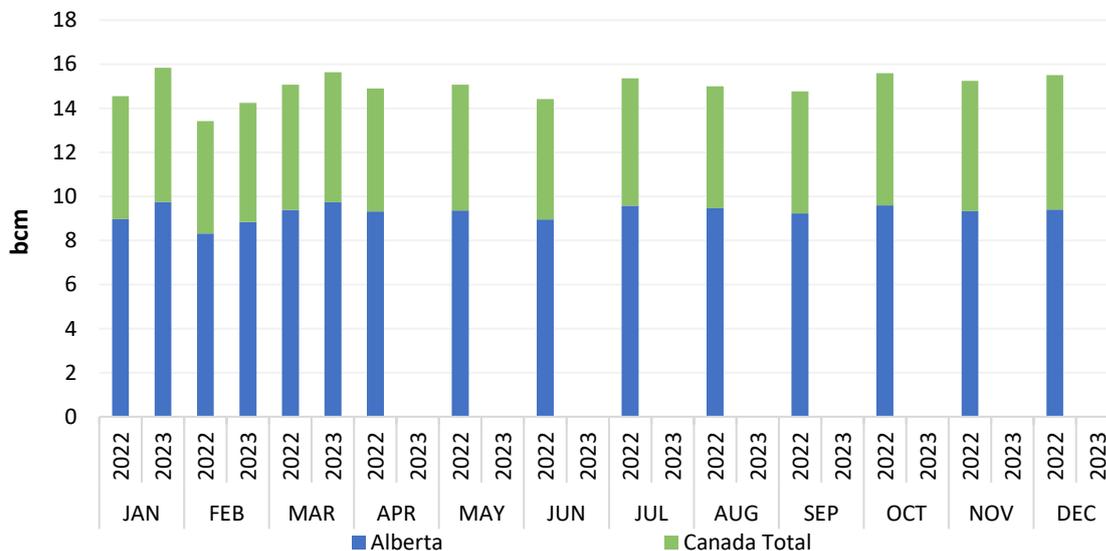


Source: GECF Secretariat based on data from Refinitiv, US EIA

### 3.4.2 Canada

Data from the Canada Energy Regulator (CER) indicated that the country's gas production in March 2023 witnessed a y-o-y increase of 4%, reaching 15.6 bcm (Figure 58). The cumulative gas production for the first quarter of 2023 also increased by 6% y-o-y reaching 45.7 bcm, reflecting the thriving status of Canada's gas sector. In April 2023, Alberta's gas production witnessed a reduction of 0.3 bcm, settling at 9.4 bcm.

Figure 58: Trend in gas production in Canada



Source: GECF Secretariat based on data from the Canada Energy Regulator (CER)

### 3.5 Other Regions

*Australia's Gorgon Stage Two development project delivered first gas:* Chevron and the joint venture partners announced the delivery of first gas from the Gorgon Stage 2 development project 130 km off the northwest coast of Western Australia at water depth of approximately 200 m. The first phase of field development was commissioned in 2015, with first LNG exports taking place in 2016. Phase 2 development included drilling 11 additional wells, construction of the associated production lines and subsea facilities in order to connect the production to the existing 3 LNG trains. According to Chevron, the field is considered one of the largest natural gas projects worldwide and the largest single resource project in the history of Australia, with 15.6 Mtpa LNG facility and a domestic gas plant with the capacity to supply 3.1 bcma to Western Australia.

*Iraq launched the sixth licensing round for gas exploration blocks:* Iraq's Ministry of Oil has launched a sixth licensing round for natural gas exploration covering 11 blocks. According to a statement from the ministry, the sixth round will help Iraq meet its domestic gas needs, particularly for power generation and the industrial, petrochemical and fertilizer sectors. The eleven blocks are mainly located in the country's western governorate of Anbar and the northern governorate of Nineveh.

*Brazil gas production reached 4.45 bcm in May 2023:* Data from the Brazilian National Agency for Petroleum (ANP), showed that gross gas production in Brazil reached 4.45 bcm in May 2023, indicating a 2% m-o-m increase and a 9.6% y-o-y increase. Approximately 52% of the produced gas was reinjected into the reservoirs. Offshore gas fields accounted for 87% of the gross monthly gas production, with the Tupi field in the Santos pre-salt basin emerging as the largest gas-producing field at 1.25 bcm. The FPSO facility in Guanabara in the shared Mero field was the highest gas producing facility with approximately 0.33 bcm.

*Argentina gas production decreased by 0.7% y-o-y:* Gross gas production in Argentina reached 4.17 bcm in May 2023, according to data from the Argentinian Ministry of Economy. This represents a 0.7% decrease compared to May 2022 (4.21 bcm), but an 8% increase compared to the production level in April 2023 (3.86 bcm). The cumulative gas production for the period of January to May 2023 amounted to 19.65 bcm. Shale gas production was 1.49 bcm in May 2023, representing 35% of the gross production while tight gas reservoir production was 0.61 bcm, accounting for 15% of the total gas production. The remaining production came from conventional fields.

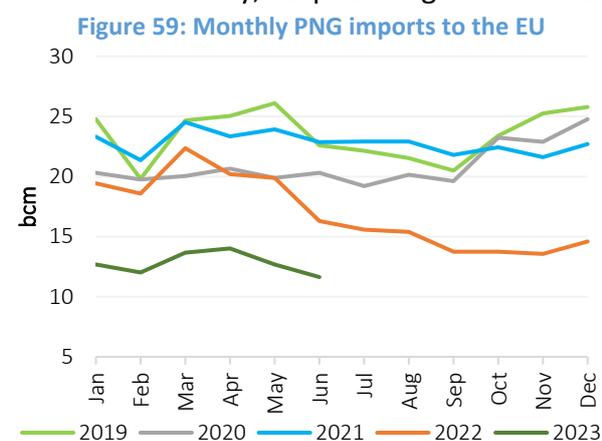
*Mexico approved the Zama oil and gas field development plan:* The National Hydrocarbons Commission (CNH), Mexico's oil and gas regulator, has approved a 4.5 billion USD development plan for the Zama field, located in the Sureste basin off the coast of Mexico's Tabasco state. The allocated investments are planned to be utilised in 2024 and 2025 for drilling and production facilities construction. The field is believed to contain about 600-800 million boe of recoverable resources. The first production is expected at the end of 2025, while peak production of approximately 0.725 bcm is projected to be reached in 2029.

## 4 Gas Trade

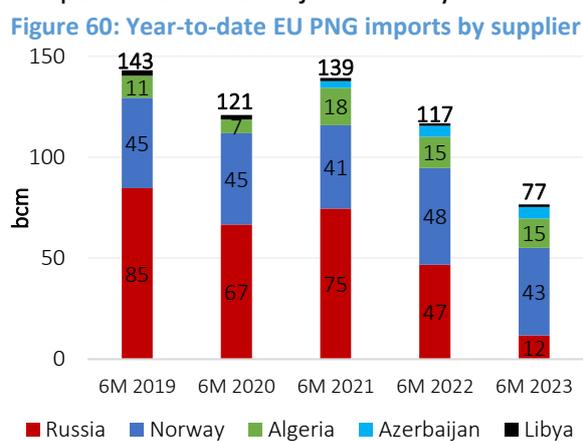
### 4.1 Pipeline Gas (PNG) Trade

#### 4.1.1 Europe

There has been a declining trend in the import of PNG to the EU in recent months. In June 2023, 11.6 bcm of PNG was imported by the EU, marking an 8% m-o-m decrease and a 29% y-o-y decline (Figure 59). Additionally, the cumulative pipeline gas supply to the EU for the first half of 2023 amounted to 76.7 bcm, reflecting a substantial 34% shortfall compared to the same period last year (Figure 60). This decline primarily stems as a result of the reduced imports from Russia and Norway, despite marginal increases in imports from Azerbaijan and Libya.

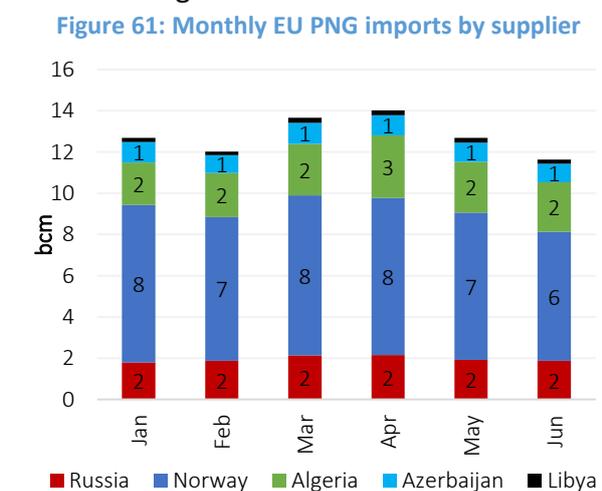


Source: GECF Secretariat based on data from McKinsey and Refinitiv

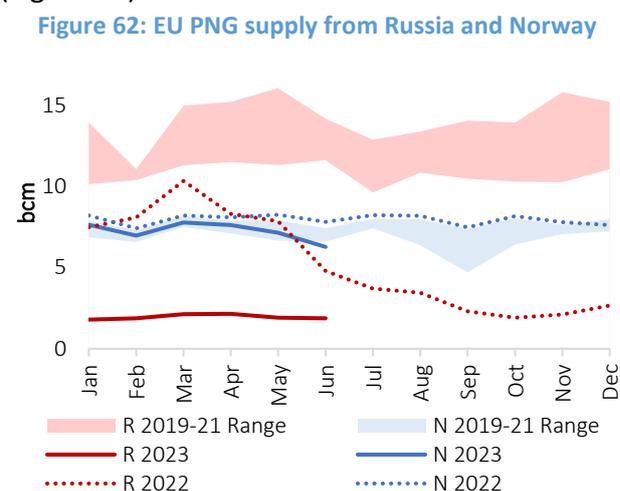


Source: GECF Secretariat based on data from McKinsey and Refinitiv

Figure 61 provides a breakdown of pipeline imports by supplier and month in 2023. Norway accounted for 57% of the total EU supply, followed by Algeria at 19% and Russia at 15%. During the first half of 2023, supply from Norway declined by 9% y-o-y, reaching 43.4 bcm, while imports from Russia decreased by 75% y-o-y to reach 11.7 bcm. From January to June 2023, Norway's average monthly PNG exports to the EU were 7.2 bcm, compared with 8.0 bcm in 2022 and 7.3 bcm during the same period from 2019 to 2021 (Figure 61). Russia's average monthly PNG exports to the EU for the same period were 2.0 bcm, compared to 7.8 bcm in 2022 and an average of 12.5 bcm from 2019 to 2021 (Figure 62).



Source: GECF Secretariat based on data from McKinsey and Refinitiv

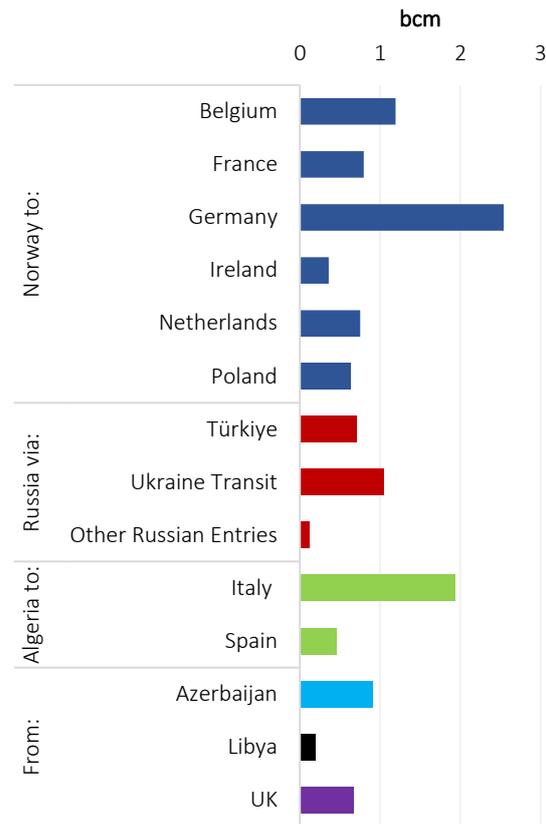


Source: GECF Secretariat based on data from McKinsey and Refinitiv

Figure 63 illustrates the PNG imports to the region in June 2023 through the major supply routes. Notably, two-fifths of Norway's volumes were supplied to Germany, while one-fifth were exported to Belgium. Algeria's exports to Italy experienced an 11% m-o-m increase, reaching 1.9 bcm. Russian flows via Turkstream increased by 2% m-o-m, although most of its exports (56%) were supplied through the Ukraine transit pipelines. On the other hand, total PNG flows from the UK to the EU fell by 70% in June, reaching their lowest level since February 2022.

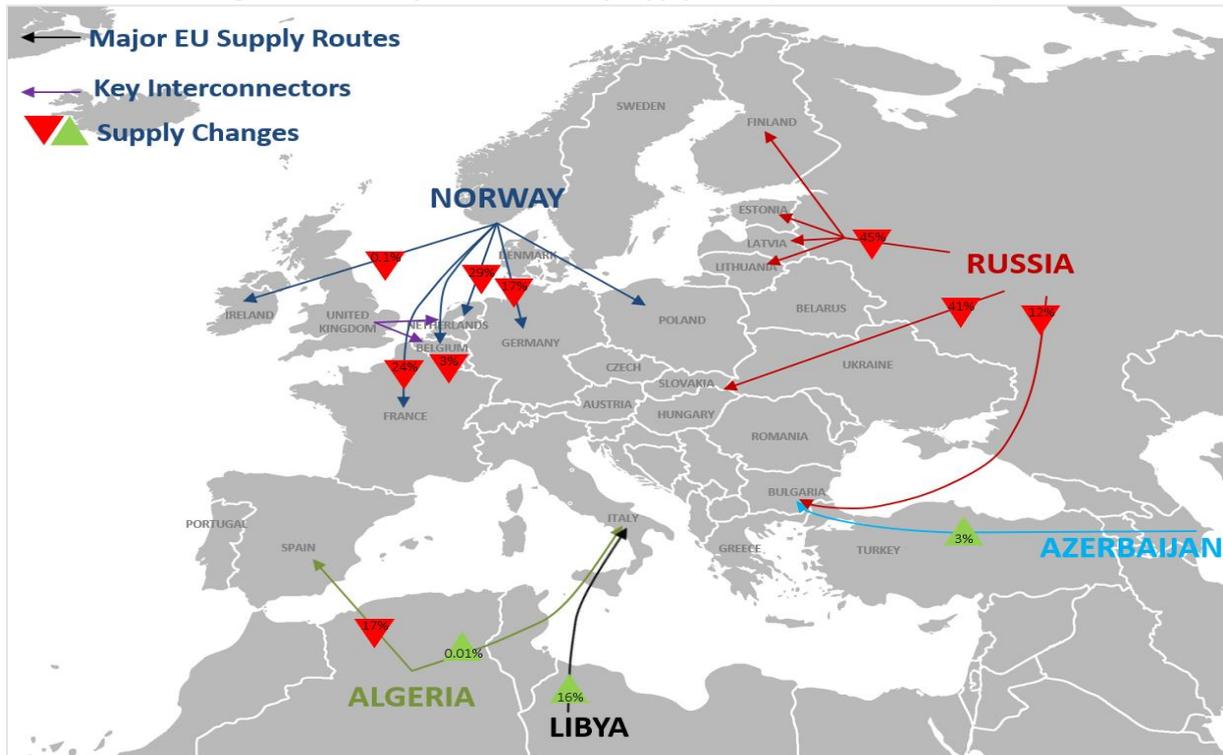
In Figure 64, the EU's PNG imports via major supply routes for the first half of 2023 are compared to the same period in 2022. Imports from Norway, via all routes, have fallen because of supply disruptions. Specifically, in 2023, volumes to Germany have been redirected to Poland. Imports from Azerbaijan and Libya increased by 3% and 16%, respectively, while supply from the UK declined by 1%.

Figure 63: EU PNG imports by supply route, in June 2023



Source: GECF Secretariat based on data from McKinsey and Refinitiv

Figure 64: PNG imports to the EU by supply route (6M 2023 v 6M 2022)

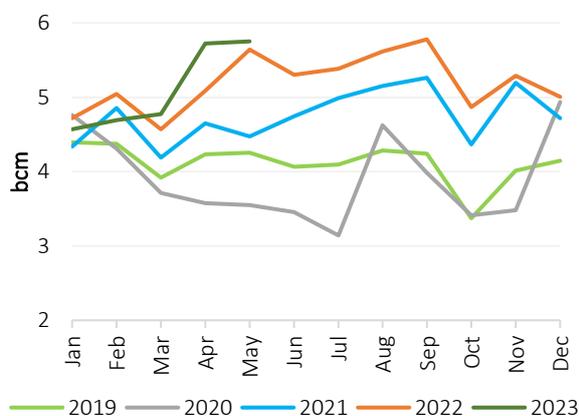


Source: GECF Secretariat based on data from McKinsey and Refinitiv

### 4.1.2 Asia

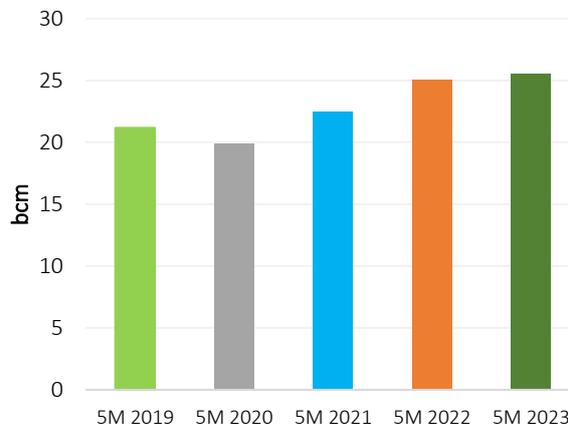
In China, the volume of PNG imported in May 2023 increased slightly by 0.5% to reach 5.8 bcm, representing a 2% increase y-o-y (Figure 65). Nevertheless, the level of gas imports, via both pipelines and LNG, continued to surge in the country. This is because the industrial sector is now fully recovered from the lockdown measures, which were imposed during the second half of last year. The average monthly PNG imports during the first five months of 2023 were 5.1 bcm, compared to 5.0 bcm during the same period in 2022, an increase of 2% (Figure 66).

Figure 65: Monthly PNG imports in China



Source: GECF Secretariat based on data from Refinitiv and General Administration of Customs China

Figure 66: Year-to-date PNG imports in China

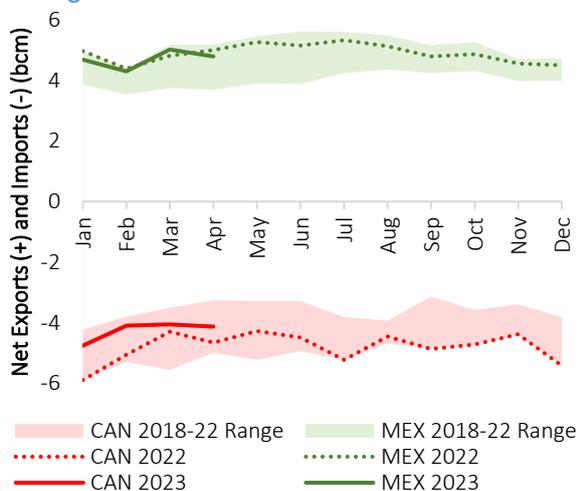


Source: GECF Secretariat based on data from Refinitiv and General Administration of Customs China

### 4.1.3 North America

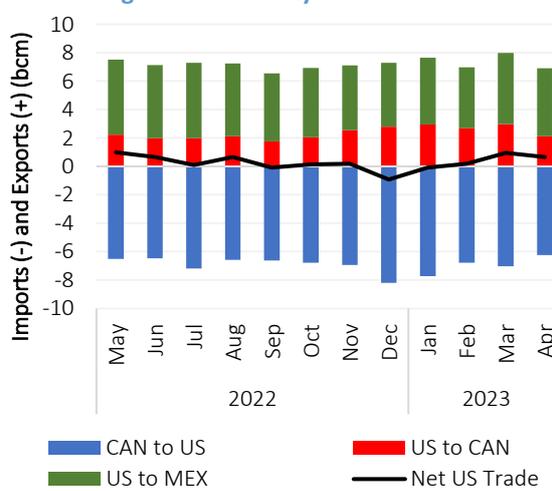
In April 2023, net PNG imports from Canada to the US increased by 2% to reach 4.1 bcm, while net PNG exports from the US to Mexico fell by 4%, reaching 4.8 bcm (Figure 67). On an annual basis, these net flows have both declined by 11% and 4%, respectively, which is further reflected in the April 2023 US to Mexico net export volumes of 0.7 bcm (Figure 68). The average monthly flows in the region have been 6.9 bcm from Canada to the US, 2.7 bcm from the US to Canada and 4.7 bcm from the US to Mexico.

Figure 67: Historical net PNG trade in the USA



Source: GECF Secretariat based on data from US EIA

Figure 68: Monthly US PNG trade



Source: GECF Secretariat based on data from US EIA

#### 4.1.4 Other Developments

*Revival of the TAPI gas pipeline project:* The governments of Turkmenistan and Pakistan have recently signed a joint implementation plan to facilitate the Turkmenistan-Afghanistan-Pakistan-India (TAPI) gas pipeline project. Originally conceptualized through inter-government agreements among the four countries in December 2010, the project encountered numerous delays since construction began in 2015. The pipeline is expected to deliver 33 bcma of supply across a distance of 1,800 km, from the Galkynysh gas field in Turkmenistan, traversing Afghanistan and Pakistan and culminating at Fazilka in India.

*Operationalisation of the Nestor Kirchner Gas Pipeline:* Ahead of the official inauguration scheduled for July 2023, Argentina's state-owned company Enarsa has commenced gas flows through the newly constructed Nestor Kirchner gas pipeline. The project is part of a comprehensive pipeline system designed to deliver natural gas supplies from the Vaca Muerta shale formation to the capital city of Buenos Aires and reverse gas flow from Argentina towards Bolivia. Bolivia's gas export agreement with Argentina, which has been severely affected in recent times by production declines, ends at the end of 2023.

*Bosnia and Herzegovina to commence negotiations on two new import pipelines:* The Council of Ministers of Bosnia and Herzegovina approved the commencement of negotiations for the construction of the New Eastern Interconnection gas pipeline. This project, estimated to cost \$250 million euros, will bring supplies to the nation from Russia via Serbia. The Council also ratified the negotiation of the Southern Interconnection pipeline project. This link is estimated to cost \$100 million euros and will supply natural gas from Azerbaijan via Croatia.

## 4.2 LNG Trade

### 4.2.1 LNG Imports

In June 2023, global LNG imports expanded sharply by 6.8% (2.09 Mt) y-o-y to reach 32.85 Mt (Figure 69). This growth was primarily driven by a strong rebound in Asia Pacific's LNG imports, with higher imports in Europe and Latin America and the Caribbean (LAC) also having some contribution (Figure 70). Conversely, the Middle East and North Africa (MENA) region experienced a decline in LNG imports. During the first half (H1) of 2023, cumulative global LNG imports grew by 4.0% (7.95 Mt) y-o-y to 206.62 Mt. The bulk of the increase in global LNG imports during H1 2023 came from Europe, followed by Asia Pacific, LAC and North America. This offset the lower LNG imports in the MENA region.

Figure 69: Trend in global monthly LNG imports

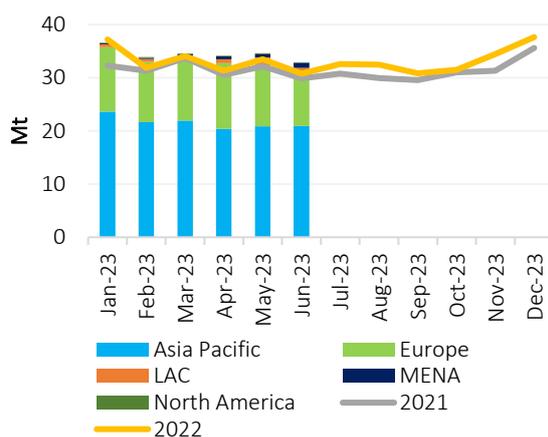
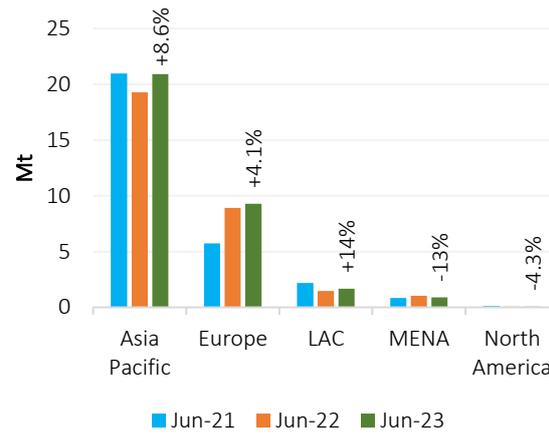


Figure 70: Trend in regional LNG imports in June



Source: GECF Secretariat based on data from ICIS LNG Edge

#### 4.2.1.1 Europe

In June 2023, the y-o-y growth rate of LNG imports in Europe slowed to 4.1% (0.36 Mt), reaching 9.29 Mt (Figure 71). The increase in LNG imports in Europe compared to the previous year was mainly due to weaker pipeline gas imports from Russia. Among individual countries, the Netherlands led the increase, followed by France and then Germany, which more than offset the weaker imports in the UK, Spain, Belgium and Italy (Figure 72). During H1 2023, cumulative LNG imports in Europe surged by 8.2% (5.16 Mt) y-o-y to reach 67.82 Mt.

The stronger LNG imports in Germany and the Netherlands were driven by weaker pipeline gas imports from Norway and Russia, as well as lower domestic gas production. In France, the higher LNG imports were a result of weaker pipeline gas imports from Norway and robust pipeline gas exports to Belgium and Germany.

On the other hand, despite a decline in pipeline gas imports from Norway, lower gas consumption and higher maintenance activity at the Dragon LNG terminal curbed the UK's LNG imports. In Spain, the drop in LNG imports was attributed to a decline in gas consumption, maintenance activity at LNG import terminals and high storage levels, which averaged 95% in the beginning of June. Meanwhile, higher gas storage levels, a decrease in gas consumption and a reduction in pipeline gas exports to Germany and the Netherlands impacted Belgium's LNG imports. Although Italy's pipeline gas imports from Russia were lower in June, its LNG imports fell due to weaker gas consumption, stronger pipeline gas imports from Algeria and Norway and healthy gas storage inventories.

Figure 71: Trend in Europe’s monthly LNG imports

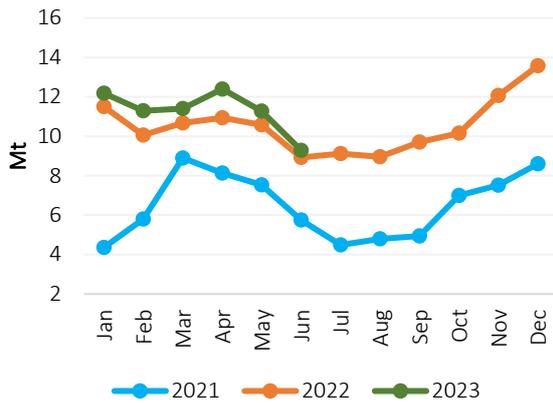
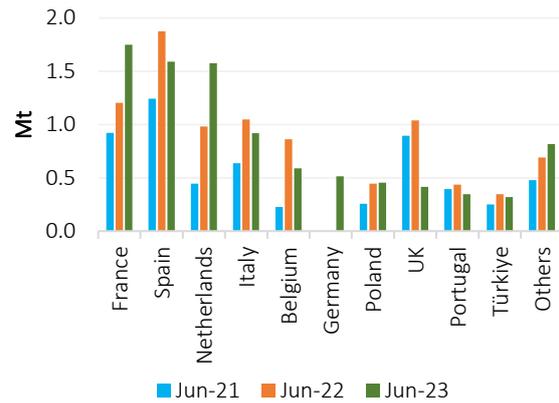


Figure 72: Top LNG importers in Europe



Source: GECF Secretariat based on data from ICIS LNG Edge

#### 4.2.1.2 Asia

In June 2023, the Asia Pacific region experienced a significant expansion in its LNG imports, growing by 8.6% (1.65 Mt) y-o-y, reaching 20.93 Mt (Figure 73). This is the first time in 2023 that the region's LNG imports have rebounded to the same levels witnessed in 2021. The growth in the Asia Pacific region was led by China, with significant contributions from Singapore, Thailand and Taiwan, which offset weaker imports in Japan and Pakistan (Figure 74). During H1 2023, the cumulative LNG imports in the Asia Pacific grew by 2.3% (2.87 Mt) y-o-y, reaching 129.38 Mt.

Chinese LNG imports surged in June 2023, reaching the highest level since January 2022. The recovery in gas demand following the COVID-19 pandemic, warmer weather conditions, increased long-term contractual LNG deliveries and declining spot LNG prices all contributed to the boost in Chinese LNG imports. In Singapore, LNG imports more than doubled year-on-year, driven by a significant increase in imports from Australia and Qatar. The stronger LNG imports in Thailand were attributed to a decline in domestic gas production and robust gas demand, particularly in the electricity sector. Additionally, Taiwan's LNG imports increased due to stronger gas demand in the electricity sector amid lower hydro and nuclear power outputs. In contrast, Japan experienced a decline in LNG imports due to weaker gas demand in the electricity sector and higher nuclear power output. The drop in Pakistan's LNG imports was primarily due to weaker spot LNG imports.

Figure 73: Trend in Asia’s monthly LNG imports

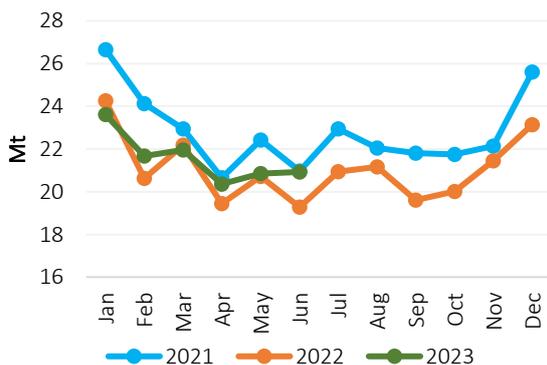
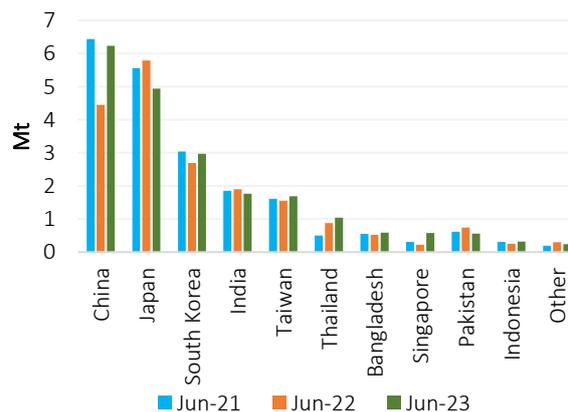


Figure 74: Top LNG importers in Asia



Source: GECF Secretariat based on data from ICIS LNG Edge

### 4.2.1.3 Latin America & the Caribbean (LAC)

In June 2023, LNG imports in the LAC region reached 1.67 Mt, marking a 14% increase (0.21 Mt) y-o-y (Figure 75). The bulk of the incremental increase in LNG imports came from Argentina. Colombia experienced modest growth (Figure 76) while Brazil recorded a significant decline in its LNG imports. In H1 2023, cumulative LNG imports in the LAC region reached 5.91 Mt, indicating a 6.9% increase (0.38 Mt) y-o-y.

Argentina's LNG imports continued to increase for the second consecutive month, primarily due to weaker pipeline gas imports from Bolivia. Meanwhile, Colombia saw a nearly threefold increase in LNG imports in June compared to the previous year in anticipation of drought conditions caused by the El Niño event, which is expected to impact hydro output. Conversely, higher hydro output in Brazil resulted in reduced gas demand in the country's electricity sector and curbed LNG imports.

Figure 75: Trend in LAC's monthly LNG imports

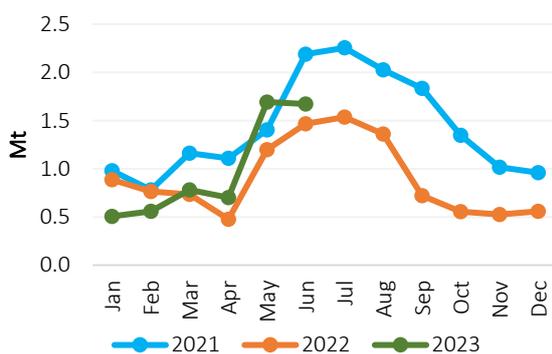
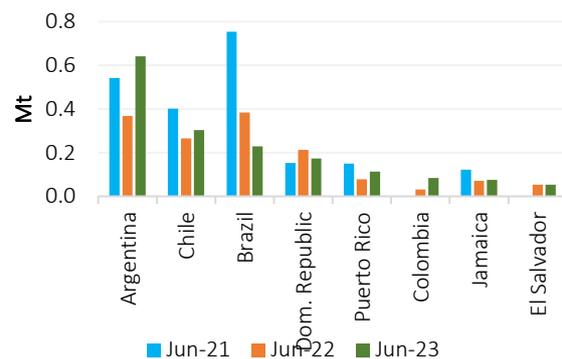


Figure 76: Top LNG importers in LAC



Source: GECF Secretariat based on data from ICIS LNG Edge

### 4.2.1.4 MENA

In June 2023, LNG imports in the MENA region experienced a 13% decline (0.13 Mt) y-o-y, reaching 0.90 Mt (Figure 77). The decrease in LNG imports was primarily observed in Kuwait and Jordan, although this was partially offset by the increase in imports in the United Arab Emirates (Figure 78). During H1 2023, the cumulative LNG imports in the MENA region declined by 18% (0.59 Mt) y-o-y, reaching 2.79 Mt. In Kuwait, the higher availability of low sulphur fuel oil (LSFO) for electricity generation led to the drop in LNG imports.

Figure 77: Trend in MENA's monthly LNG imports

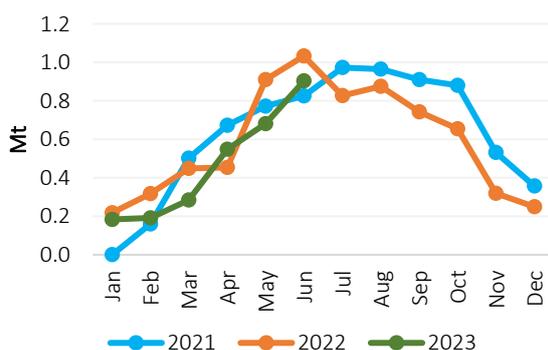
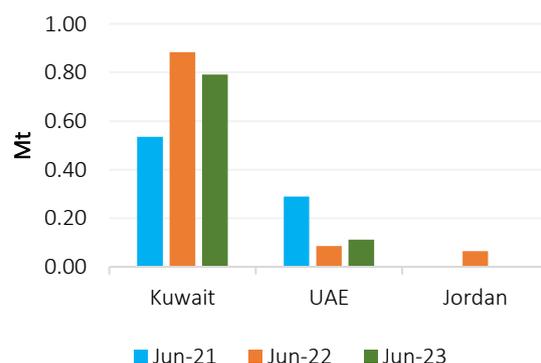


Figure 78: Top LNG importers in MENA



Source: GECF Secretariat based on data from ICIS LNG Edge

## 4.2.2 LNG Exports

In June 2023, the growth rate of global LNG exports slowed to 0.4% (0.13 Mt) y-o-y, marking the weakest growth since January 2021. Total global LNG exports reached 32.18 Mt during June 2023 (Figure 79). The increase in LNG exports from non-GECF countries and a rise in LNG reloads outweighed the lower LNG exports from GECF member countries. The share of non-GECF countries and LNG reloads in global LNG exports increased from 50.0% and 0.6%, respectively, from a year earlier to 50.4% and 0.8% in June 2023. Conversely, the GECF's market share in global LNG exports decreased from 49.4% to 48.8%. During H1 2023, cumulative global LNG exports reached 205.45 Mt, indicating a 4.1% increase (8.06 Mt) y-o-y. In June 2023, the US, Qatar and Australia were the top LNG exporting countries (Figure 80).

Figure 79: Trend in global monthly LNG exports

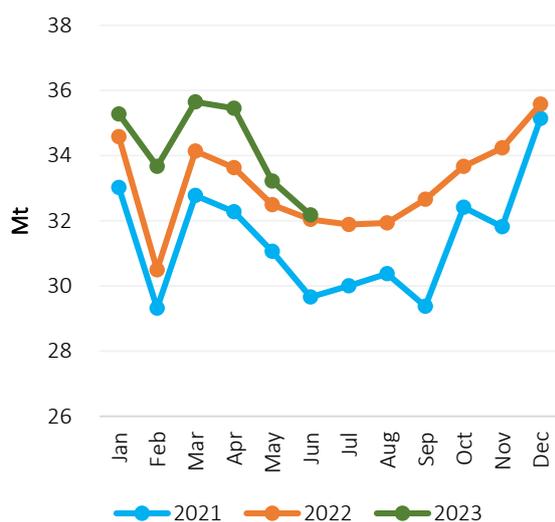
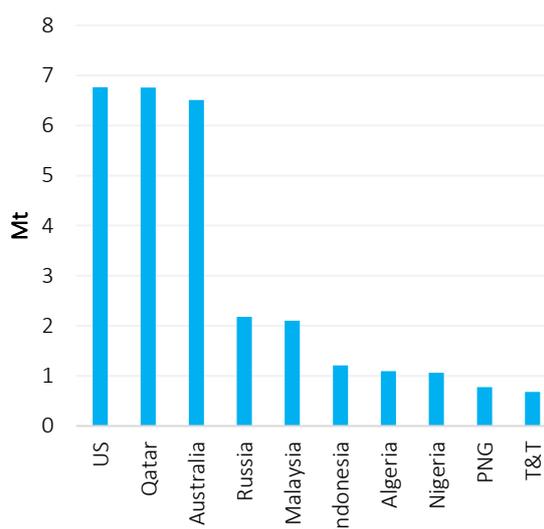


Figure 80: Top 10 LNG exporters in Jun 2023



Source: GECF Secretariat based on data from ICIS LNG Edge

### 4.2.2.1 GECF

In June 2023, LNG exports from GECF member countries and observers declined by 1.0% (0.15 Mt) y-o-y, reaching a total of 15.69 Mt (Figure 81). The weaker LNG imports were driven by Russia, Egypt, Nigeria, Malaysia, Equatorial Guinea, Norway and the United Arab Emirates. Conversely, LNG exports increased in Qatar, Angola, Algeria, Mozambique, Trinidad and Tobago and Peru (Figure 82). During H1 2023, cumulative LNG exports from GECF member and observer countries increased by 2.2% (2.13 Mt) y-o-y, totalling 99.93 Mt.

In Russia, higher maintenance activity at the Sakhalin 2 and Yamal LNG facilities led to a reduction in LNG exports. Lower feedgas availability in Egypt and Nigeria contributed to the decline in LNG exports in both countries. In June 2023, Egypt did not export any LNG cargo. The decline in Malaysia's LNG exports was mainly attributed to weaker exports from the Bintulu LNG facility. An unplanned outage at the Hammerfest LNG facility caused a drop in LNG exports from Norway.

On the other hand, lower maintenance activity at the Qatargas LNG and Soyo LNG facilities boosted LNG exports from Qatar and Angola. In Algeria and Trinidad and Tobago, higher feedgas availability supported the increase in LNG exports from both countries. Finally, the continued ramp-up in LNG exports from the Coral South FLNG facility drove Mozambique's LNG exports higher.

Figure 81: Trend in GECF monthly LNG exports

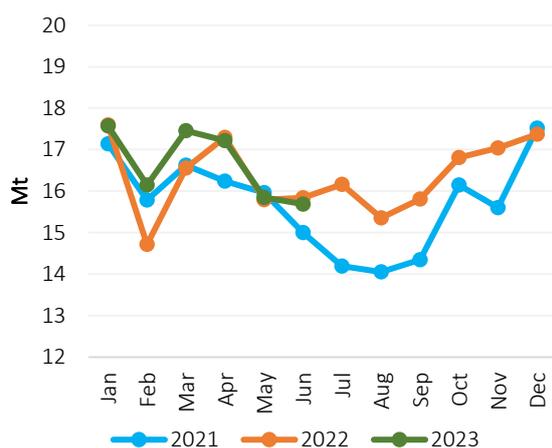
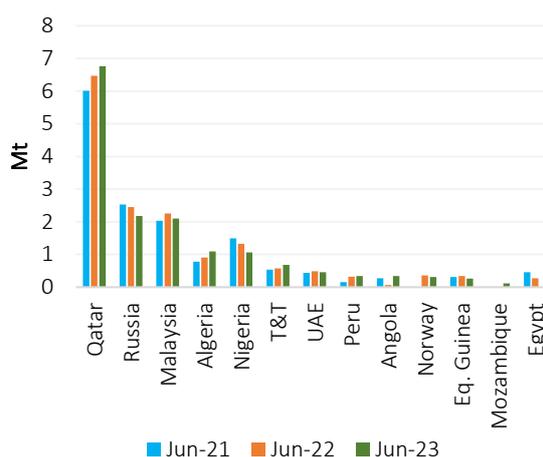


Figure 82: GECF's LNG exports by country



Source: GECF Secretariat based on data from ICIS LNG Edge

#### 4.2.2.2 Non-GECF

In June 2023, LNG exports from non-GECF countries witnessed a modest increase by 1.3% (0.21 Mt) y-o-y, reaching 16.23 Mt (Figure 83). This represents the slowest growth for non-GECF countries since December 2022. This increase was mainly driven by the US, Indonesia and Papua New Guinea, which more than offset lower exports from Australia, Oman and Brunei (Figure 84). Cumulative LNG exports from non-GECF countries reached 102.78 Mt in H1 2023, marking a growth of 4.8% (4.70 Mt) y-o-y.

Despite higher maintenance activity at the Sabine Pass LNG facility, the stronger LNG exports from the Freeport LNG facility contributed to the increase in US LNG exports. In Indonesia, the increase in LNG exports was attributed to lower maintenance activity at the Tangguh LNG facility compared to the previous year.

Conversely, the drop in Australia's LNG exports was driven by lower exports from the APLNG, Darwin, Gorgon, North West Shelf, Pluto and Wheatstone LNG facilities. The weaker LNG exports from Pluto were due to higher maintenance activity, while lower feedgas availability curbed LNG exports from the Darwin LNG facility. In Oman, lower LNG exports were likely due to the planned maintenance activity in May 2023.

Figure 83: Trend in non-GECF monthly LNG exports

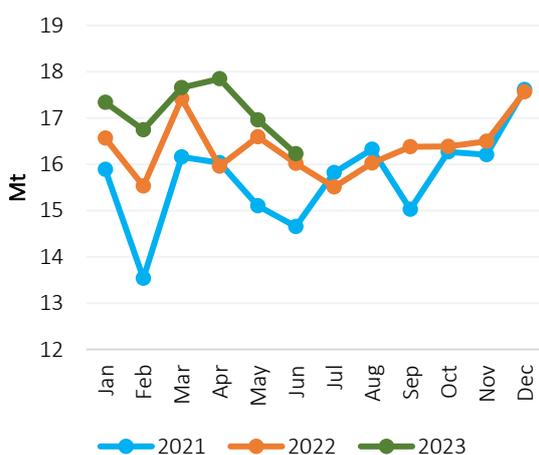
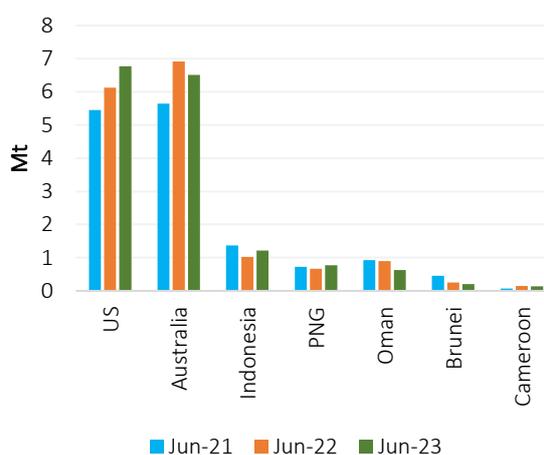


Figure 84: Non-GECF's LNG exports by country



Source: GECF Secretariat based on data from ICIS LNG Edge

### 4.2.3 Global LNG Reloads

In June 2023, there was a significant jump in global LNG reloads of 43% (0.08 Mt) y-o-y, reaching 0.27 Mt (Figure 85). The stronger LNG reloads were driven by higher reloading activity in Brazil, Singapore, Indonesia, Jamaica and China, which more than offset lower LNG reloads in Malaysia and Spain (Figure 86). In H1 2023, cumulative global LNG reloads surged by 82% (1.23 Mt) y-o-y, reaching 2.74 Mt.

Brazil reloaded its first LNG cargo since the last reload in October 2021, which is expected to be delivered to the Sagunto LNG facility in Spain. The stronger LNG reloads in Singapore were driven by an increase in LNG storage and reloading activity by portfolio players with terminal access in the country. The recovery in spot LNG demand in Asia, particularly in China, supported the LNG reloads from Singapore. In Indonesia, higher intra-country LNG trade contributed to the increase in LNG reloads, with all the LNG cargoes reloaded from the Cilamaya LNG facility.

Conversely, the decline in Malaysia's LNG reloads was attributed to weaker intra-country LNG trade. Furthermore, Spain's LNG reloads declined due to weaker LNG demand in Italy. Italy has been the main market for Spain's LNG reloads over the past year.

Figure 85: Trend in global monthly LNG reloads

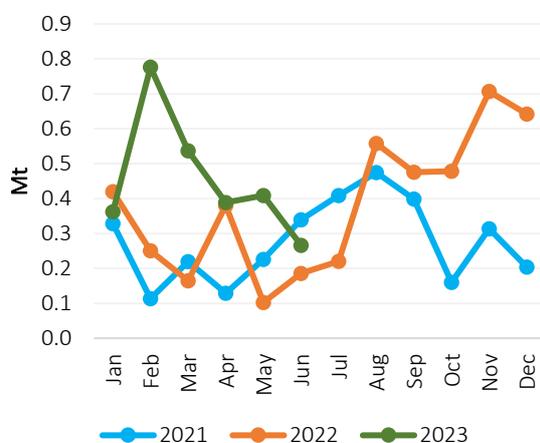
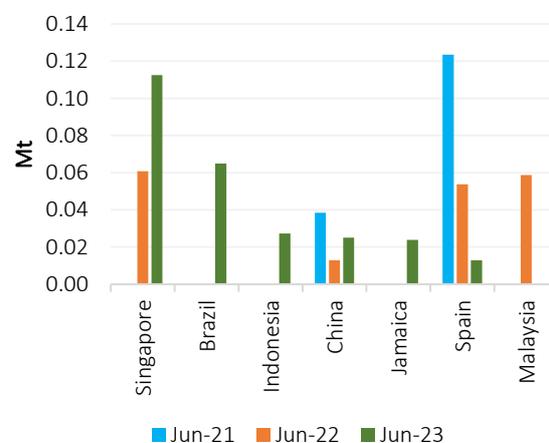


Figure 86: Global LNG reloads by country



Source: GECF Secretariat based on data from ICIS LNG Edge

### 4.2.4 Arbitrage Opportunity

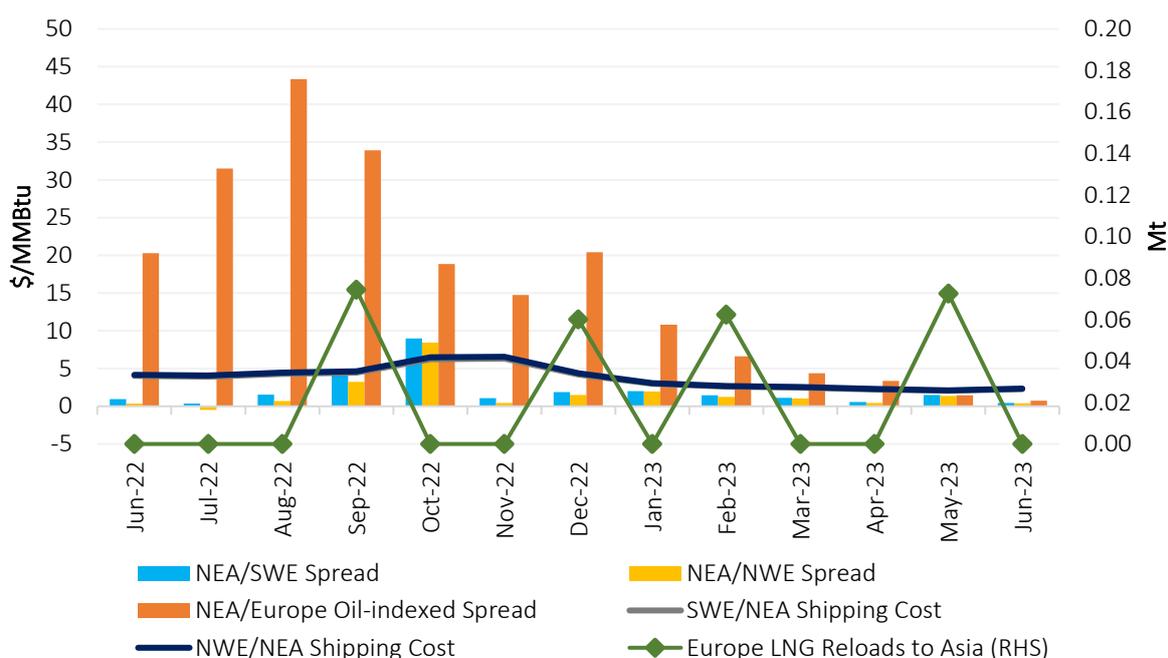
In June 2023, the opportunity for LNG reloads from Europe to the Asia Pacific region unprofitable. The convergence in spot LNG prices in the Asia Pacific and Europe led to a widening premium of spot shipping costs from Europe to Asia over the spot LNG price differences between the markets (Figure 87). Similarly, the price spread between the spot LNG prices in Asia and oil-indexed prices in Europe remained at a significant discount to the spot shipping cost from Europe to Asia for the second consecutive month.

The price spreads between NEA/SWE and NEA/NWE fell sharply, recording declines of 71% (\$1.05/MMBtu) and 72% (\$1.00/MMBtu) m-o-m to \$0.44/MMBtu and \$0.39/MMBtu, respectively. The weaker price spreads were attributed to a higher increase in spot LNG prices in Europe compared to Asia Pacific. Likewise, the price difference between spot LNG prices in Asia and oil-indexed prices in Europe declined by 50% (\$0.73/MMBtu) m-o-m to reach a multi-year low of \$0.72/MMBtu.

Conversely, the shipping costs for the NEA/SWE and NEA/NWE spot routes stood at \$2.28/MMBtu and \$2.35/MMBtu, respectively, representing increases of 11% (\$0.23/MMBtu) and 12% (\$0.24/MMBtu) m-o-m, respectively. However, it is important to note that shipping costs can vary depending on the specific vessels used. Medium to long-term chartered vessels may have lower costs compared to spot shipping rates. The absence of the arbitrage opportunity discouraged spot LNG reloads from Europe to Asia Pacific.

Furthermore, the NEA/SWE price differential, as well as the price spread between NEA spot LNG and European oil-indexed gas prices, slumped by 55% (\$0.53/MMBtu) and 97% (\$19.58/MMBtu) y-o-y, respectively. Conversely, the NEA/NWE price differential was up slightly by 8.3% (\$0.03/MMBtu) y-o-y. Finally, the NEA/SWE and NEA/NWE spot shipping costs dropped by 43% (\$1.74/MMBtu) and 44% (\$1.82/MMBtu) y-o-y.

Figure 87: 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

**Suntien Tangshan LNG terminal received its commissioning cargo:** The Suntien Tangshan LNG terminal in China received its commissioning LNG cargo on June 18, 2023. Suntien Green Energy is the developer of the LNG import terminal, and the first phase of the project has a capacity of 5 Mtpa. There are plans to increase the import capacity of the terminal to 12 Mtpa over two subsequent phases. Qatargas delivered the commissioning cargo from its LNG facility in Ras Laffan, Qatar. Suntien has a 15-year sales and purchase agreement (SPA) with Qatargas for 1 Mtpa of LNG effective from 2022.

**TotalEnergies invests in Rio Grande LNG project** – On June 13, 2023, TotalEnergies signed a framework agreement with NextDecade, the project developer of the Rio Grande LNG facility in the US. As part of the framework agreement, TotalEnergies will have a 16.7% share in the first phase of the project, which consists of three LNG trains and a combined capacity of 17.5 Mtpa. TotalEnergies will also offtake 5.4 Mtpa of LNG from the first phase of the project for

20 years. Furthermore, TotalEnergies will acquire a 17.5% share in NextDecade for \$219 million and will be entitled to participate in future expansions as well as a carbon capture and storage (CCS) project.

*LNG ship-to-ship operations commences in St. Croix* –LNG ship-to-ship transfer operations commenced in St. Croix in the Caribbean on June 22, 2023. New Fortress Energy (NFE) and Ocean Point Terminals jointly developed the ship-to-ship operations. The Gaslog Singapore floating storage unit (FSU) will be utilised for the operations. LNG will be delivered to the FSU after which it will be reloaded onto small vessels for export to markets in the Caribbean.

*Second round of EU joint gas purchasing* – The second round of the EU joint gas purchasing was launched on June 26, 2023. Gas buyers were invited to submit their gas demand needs on the joint gas purchasing platform for the demand aggregation between June 26 and July 3, 2023. International gas suppliers were then invited to submit bids for gas supply between July 7 and 10, 2023. Prisma, the operator of the platform, matched the gas demand with the gas supply and participating companies were informed of the results on July 12, 2023. Gas buyers and suppliers are currently in negotiation for the potential Sales and Purchase Agreements (SPAs).

In terms of LNG agreements, seven contracts were signed in June 2023, and their details are shown in Table 4 below.

**Table 4: New LNG sale agreements signed in June 2023**

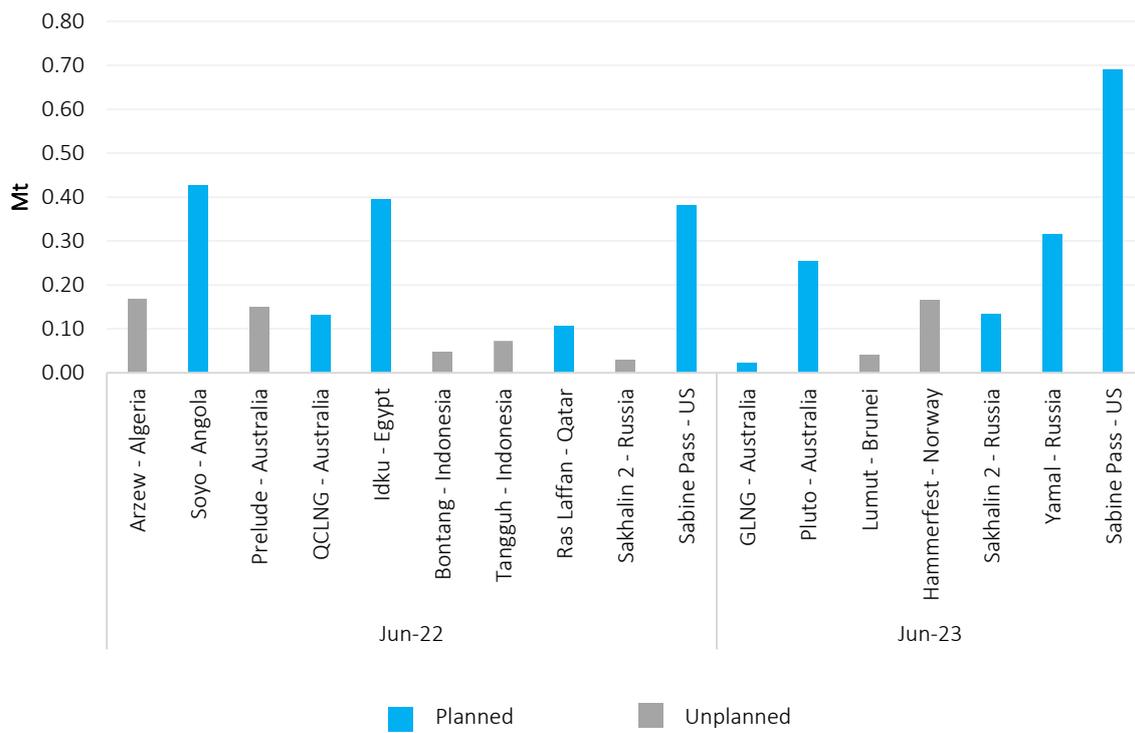
Contract Type	Exporting Country	Project	Seller	Importing Country	Buyer	Volume (Mtpa)	Duration (Years)
SPA	Qatar	North Field East	QatarEnergy	Bangladesh	Petrobangla	2	15
SPA	Oman	Qalhat LNG	Oman LNG	Bangladesh	Petrobangla	0.25-1.5	10
SPA	Qatar	North Field East	QatarEnergy	China	CNPC	4	27
SPA	US	Sabine Pass Expansion	Cheniere	Portfolio	Equinor	1.75	15
SPA	US	Calcasieu Pass 2	Venture Global	Germany	SEFE	2.25	20
SPA	US	Sabine Pass Expansion	Cheniere	China	ENN	1.8	20
SPA	Indonesia	Bontang LNG	Bontang LNG Sellers	Portfolio	Vitol	0.55	2

Source: GECF Secretariat based on Project Updates and News

#### 4.2.6 Maintenance Activity at LNG Liquefaction Facilities

In June 2023, the total planned maintenance and unplanned outages at global liquefaction facilities amounted to 1.62 Mtpa, which represents a decline from 1.91 Mtpa of global liquefaction capacity impacted in June 2022 (Figure 88). The GLNG and Pluto LNG facilities in Australia, Sakhalin 2 and Yamal LNG facilities in Russia and the Sabine Pass LNG facility in the US underwent scheduled maintenance activity. Conversely, the Lumut LNG facility in Brunei and Hammerfest LNG facility in Norway encountered unplanned outages.

Figure 88: Maintenance activity at LNG liquefaction facilities during June (2022 and 2023)



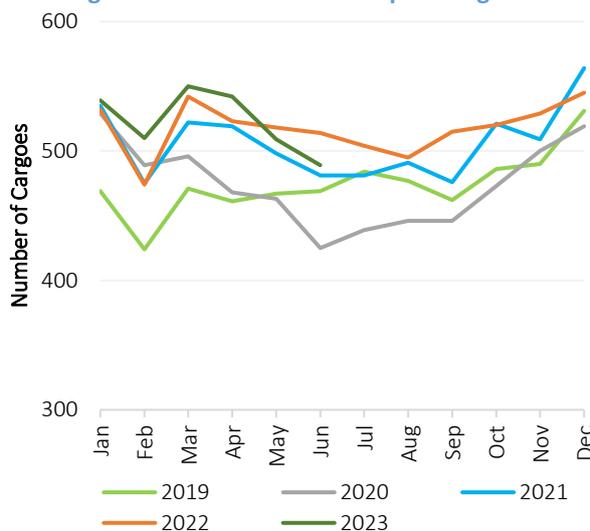
Source: GECF Secretariat based on information from Argus, ICIS LNG Edge and Refinitiv

## 4.2.7 LNG Shipping

The total number of LNG export cargoes fell by 4% m-o-m in June 2023 to reach 489 (Figure 89). The total number of shipments for the first half of 2023 amounts to 3,139, a 1% increase (36 cargoes) compared with the same period in 2022 (Figure 90).

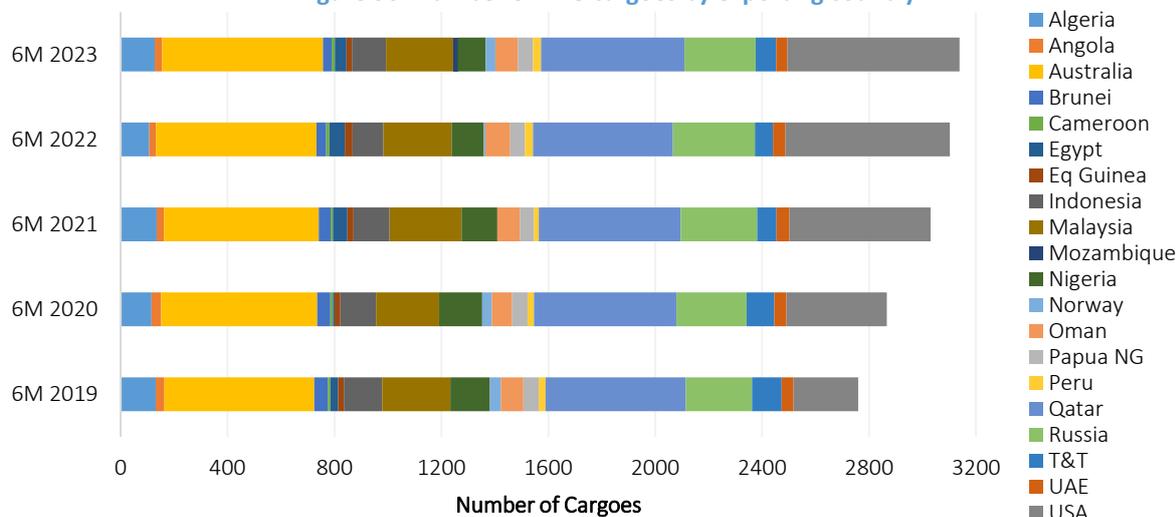
Norway, the US and Algeria observed noteworthy increases in cargo exports compared to the same period in 2022, delivering 30, 28 and 20 more cargoes, respectively (Figure 91). Norway's 500% increase in shipments is explained by the restart of exports in June 2022. Excluding this case, the next largest relative year-to-date increases in 2023 were observed in Algeria (19%) and Trinidad and Tobago (13%).

Figure 89: Number of LNG export cargoes



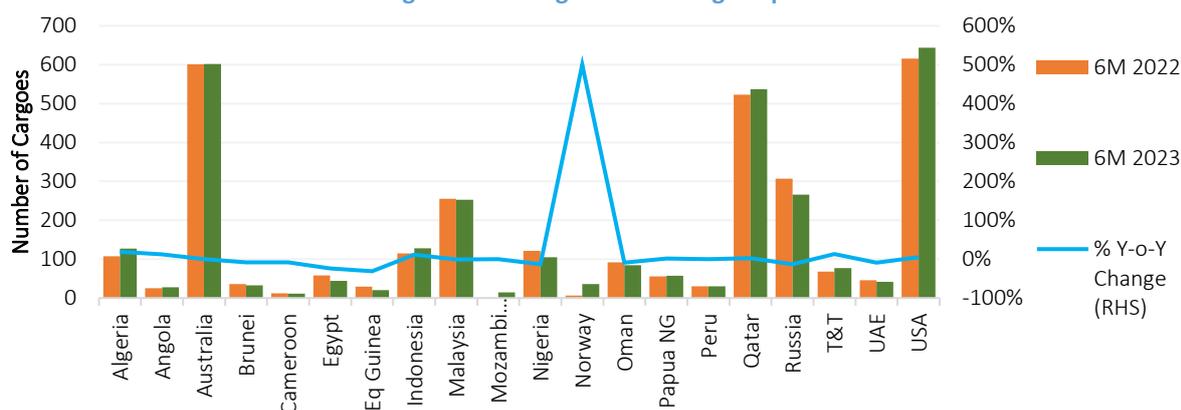
Source: GECF Secretariat based on data from ICIS LNG Edge

Figure 90: Number of LNG cargoes by exporting country



Source: GECF Secretariat based on data from ICIS LNG Edge

Figure 91: Changes in LNG cargo exports

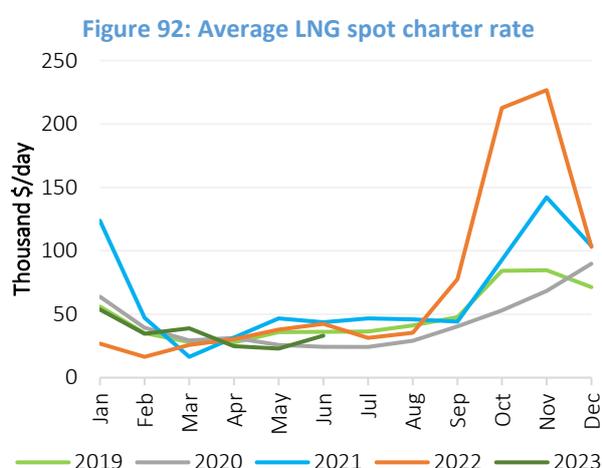


Source: GECF Secretariat based on data from ICIS LNG Edge

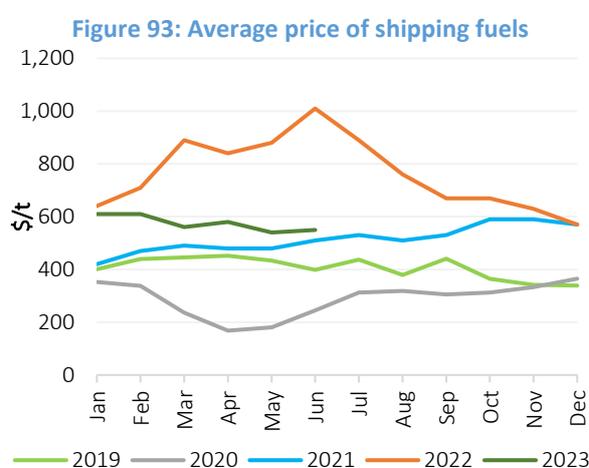
In June 2023, the spot charter rate for steam turbine LNG carriers rose to an average of \$33,000 per day. This marked a substantial 44% m-o-m increase, although it remained 22% lower compared to the same period last year (Figure 92). With regards to steam turbine carriers, the variation below the five-year historical average for spot charter rates has now narrowed to \$5,900 per day. For other segments of the LNG carrier fleet, the average monthly spot charter rate for TDFE-propelled vessels increased by 37% to reach \$51,900 per day. Similarly, two-stroke propelled vessels saw their average monthly spot charter rate rise by 26% during the month, reaching \$75,800 per day.

Generally, spot charter rates for LNG carriers fall to a low point at the end of the northern hemisphere winter, which was observed in 2023. However, the subdued charter rates held sway for an extended period, reflecting the reduced LNG demand in both Europe and Asia. At the beginning of June, the opportunity for arbitrage between these two markets created an incentive for US LNG carriers to deliver to Asia. The increased sailing distance subsequently tightened shipping markets in both the Atlantic and Pacific basins, leading to an upsurge in spot charter rates.

In June 2023, the average price of the leading shipping fuels was \$550 per tonne, a 2% increase from the previous month, but 46% lower y-o-y (Figure 93).



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



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

The GECF's assessment of LNG spot shipping costs for steam turbine carriers in June 2023 is shown in Table 5.

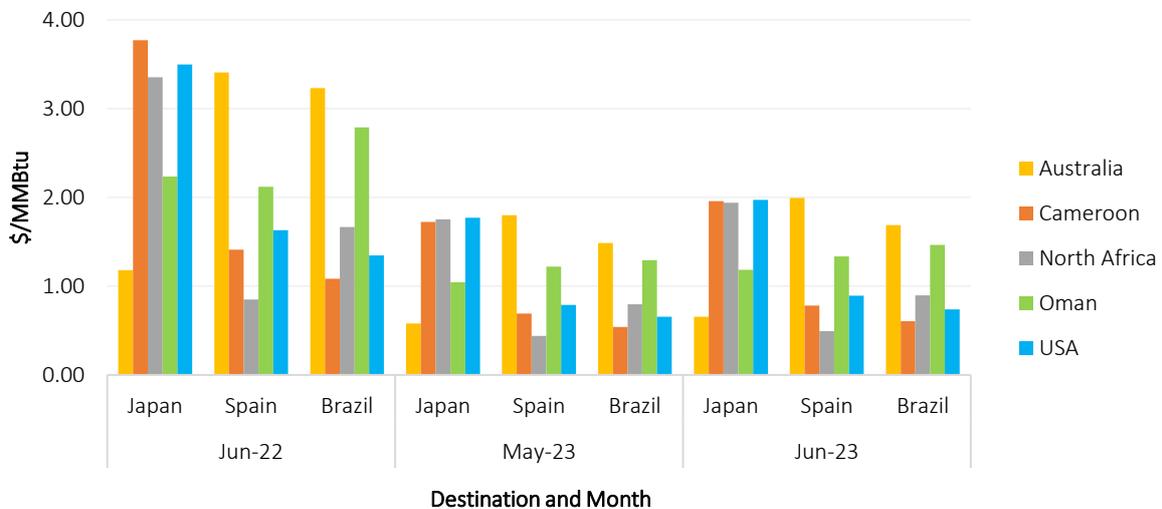
**Table 5: Shipping costs for LNG spot cargoes from selected regions (\$/MMBtu) – June 2023**

		Destination						
		To Japan	To China	To India	To UK	To Spain	To Argentina	To Brazil
LNG Supplier	From							
	Spot LNG delivered price	10.78	10.78	10.63	9.24	9.61	10.23	9.60
	Australia	0.65	0.69	0.79	2.05	1.99	1.56	1.69
	Cameroon	1.96	1.93	1.30	0.84	0.78	0.92	0.61
	North Africa	1.94	1.93	1.11	0.56	0.49	1.29	0.90
	Oman	1.18	1.10	0.26	1.39	1.33	1.49	1.46
	USA	1.97	2.17	2.12	0.91	0.89	1.23	0.74

Source: GECF Shipping Cost Model

In June 2023, the LNG carrier spot charter rate, the cost of LNG shipping fuels and the delivered spot LNG prices all increased from the previous month causing an increase in the LNG shipping costs by up to \$0.23/MMBtu compared to the May 2023 ( Figure 94). Furthermore, when compared to the same month in the previous year, charter rates, fuel prices and delivered spot LNG prices were all significantly lower in June 2023, resulting in LNG shipping costs being up to \$1.81/MMBtu lower.

Figure 94: LNG spot shipping costs for steam turbine carriers



Source: GECF Shipping Cost Model

**Acquisition of DSME by Hanwha:** There has been a major development in the shipping industry in South Korea with the finalisation of the acquisition of Daewoo Shipbuilding & Marine Engineering (DSME) by the Hanwha group of companies. Having secured approval from the South Korean antitrust regulators, the move will include changes to the management structure and renaming of the company to Hanwha Ocean. DSME has long held a prominent position as one of South Korea’s major shipbuilding firms, with a history of constructing LNG carriers as well as other classes of vessels.

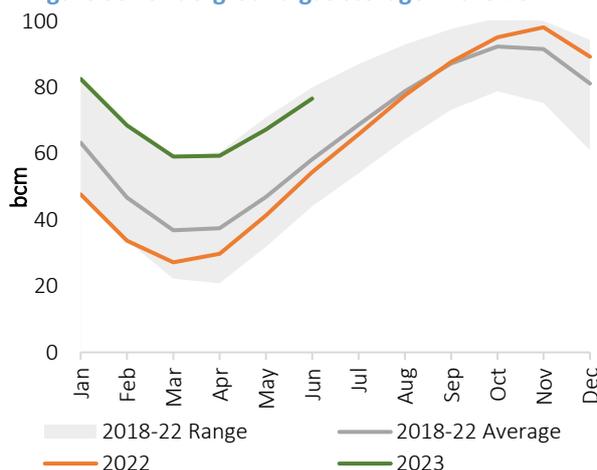
**QatarEnergy to advance negotiations for LNG carrier procurement from South Korean shipyards:** South Korea’s “Big 3” shipbuilding firms, namely HD Hyundai Heavy Industries (HHI), Hanwha Ocean and Samsung Heavy Industries (SHI), will soon begin discussions with QatarEnergy to secure construction orders for Qatar’s upcoming phase of LNG carrier fleet expansion. Negotiations are expected to focus on the procurement of forty carriers, each with a capacity at least 170,000 m<sup>3</sup>. The allocation is expected to be 16 carriers for SHI, 12 carriers for Hanwha Ocean and 10 carriers for HHI. The total cost of this phase is estimated at \$10.7 billion, thus placing the cost per vessel close to \$260 million.

## 5 Gas Storage

### 5.1 Europe

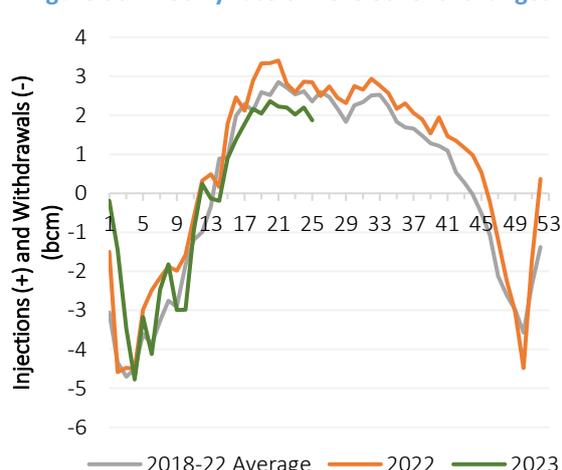
The total working capacity for underground gas storage (UGS) sites in the EU currently stands at 104 bcm. EU countries are continuing to replenish gas stocks, in line with the region’s target of filling storage sites to at least 90% of capacity by November 1, 2023. In June 2023, the average daily volume of gas in storage rose to 76.6 bcm, from the level of 67.3 bcm recorded one month earlier (Figure 95). This monthly average volume of gas was 22.2 bcm higher compared to June 2022 and 18.3 bcm higher than the 5-year historical average. The average UGS capacity utilization in the region increased to 74%. Throughout June, a total of 9.3 bcm of gas was injected into UGS facilities, while gas withdrawals amounted to just 0.7 bcm.

Figure 95: Underground gas storage in the EU



Source: GECF Secretariat based on data from AGSI+

Figure 96: Weekly rate of EU UGS level changes



Source: GECF Secretariat based on data from AGSI+

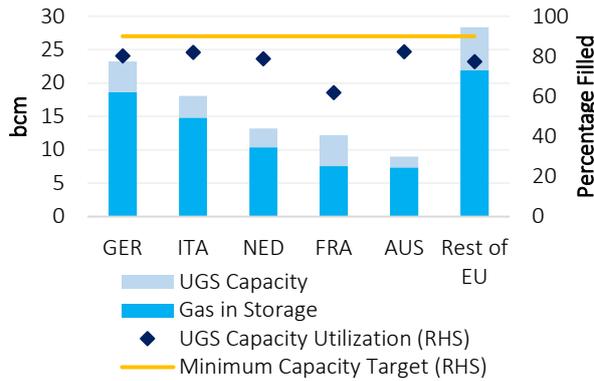
Net gas injections were observed during all 30 days of June 2023 at an average injection rate of 2.1 bcm/week. Having started the net gas injection season with an already elevated level of gas in storage, there is less pressure to fill storage sites as quickly this year. Accordingly, the June 2023 average injection rate is lower than the 2.8 bcm/week recorded in June 2022 and the 2.6 bcm/week for the same month during the last five years (Figure 96).

As of June 30, 2023, the UGS level exceeded the preliminary average target for EU member states by a substantial 32.7 bcm. Therefore, just 13.0 bcm of further gas injections is now required to achieve a regional average level filling of 90% by November 1, 2023.

By the end of June 2023, Italy, Austria, Germany and the Netherlands have each filled their UGS sites beyond 80% of their capacity (Figure 97). France has continued to make headway in its stock build, taking its level of gas in storage to 62% of capacity.

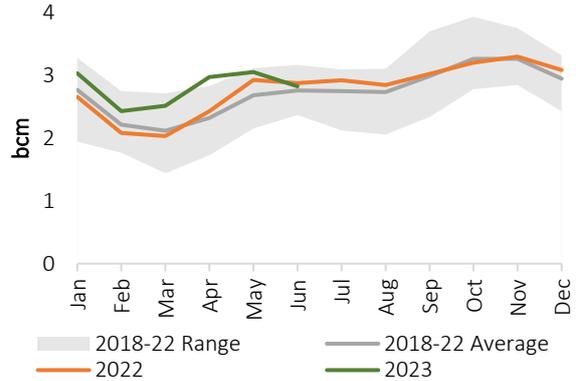
The EU has a total LNG storage capacity of 5.0 bcm, primarily concentrated in Spain (40%) and France (16%). In June 2023, the total amount of LNG stored in the EU stood at 2.8 bcm, representing a 7% decrease compared to the previous month and a 2% decrease compared to the same period last year (Figure 98). The decline in pipeline gas imports during the month may have necessitated increased LNG sendout from storage in the region.

**Figure 97: UGS in EU countries as of June 30, 2023**



Source: GECF Secretariat based on data from AGSI+

**Figure 98: Total LNG storage in the EU**

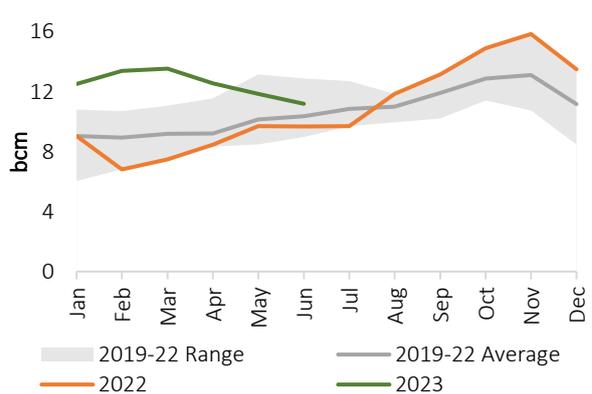


Source: GECF Secretariat based on data from ALSI

## 5.2 Asia

Japan and South Korea possess LNG storage capacities of 9.8 bcm and 6.8 bcm, respectively. In June 2023, the total volume of LNG in storage reached an estimated 11.2 bcm, which reflects the lower-than-anticipated gas demand observed in recent months. Of this quantity, Japan accounted for 5.0 bcm, and South Korea 6.2 bcm (Figure 99). This total quantity was 6% lower m-o-m but 16% higher y-o-y, and was 0.8 bcm higher than the four-year average.

**Figure 99: LNG in storage in Japan and South Korea**

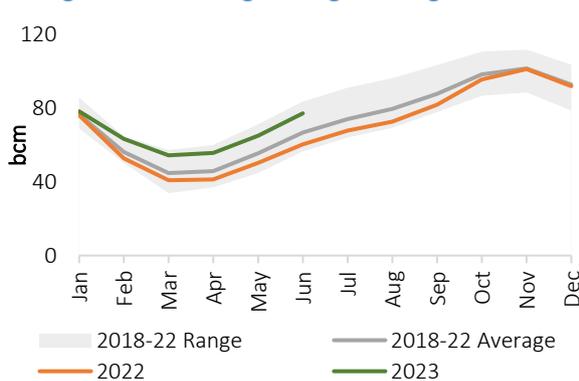


Source: GECF Secretariat based on data from Refinitiv

## 5.3 North America

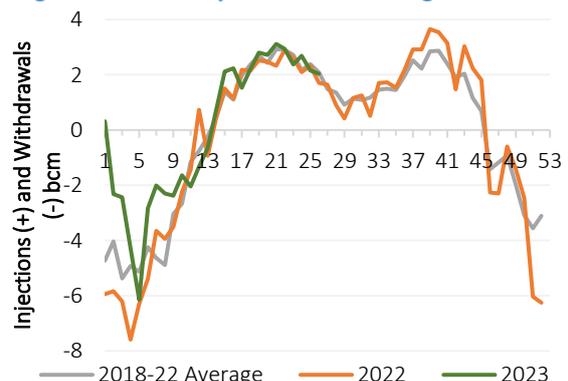
The total working gas storage capacity in the US stands at 134 bcm, with the country in the midst of the net gas injection season. Accordingly, in June 2023, the average daily volume of gas in storage rose to 77.0 bcm from 64.9 bcm in the previous month (Figure 100). This amount was 16.7 bcm higher than in the same month the previous year, and 10.3 bcm higher than the 5-year historical average. The average UGS capacity utilization rose to 57%. During June 2023, gas withdrawal from storage occurred at an average rate of 2.4 bcm/week, compared with 2.3 bcm/week in 2022 and 2.5 bcm/week for the 5-year average (Figure 101).

**Figure 100: Underground gas storage in the US**



Source: GECF Secretariat based on data from US EIA

**Figure 101: Weekly rate of UGS changes in the US**



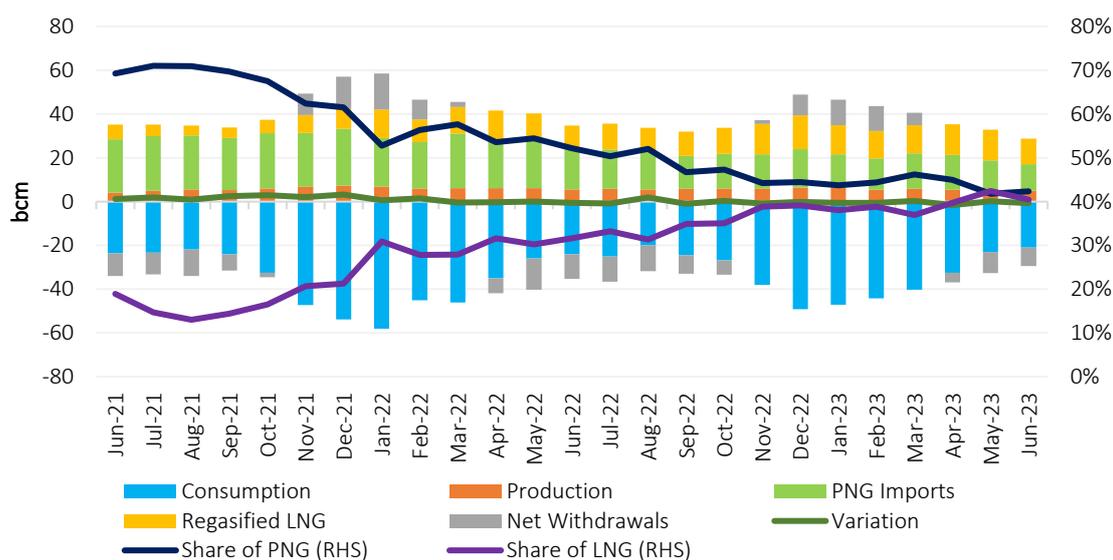
Source: GECF Secretariat based on data from US EIA

## 6 Gas Balance

### 6.1 EU + UK

In June 2023, pipeline gas retained its position as the largest source of gas supply to the EU + UK. The share of pipeline gas imports in the EU + UK's gas supply mix was unchanged from the previous month at 42%. However, the share of pipeline gas imports declined by 10% from June 2022. Conversely, the share of regasified LNG declined modestly by 2% to 40% in June 2023 but was 8% higher from a year earlier (Figure 102). The decline in the share of regasified LNG was attributed to a sharper decline in regasified LNG sendout into the EU + UK's gas market. The shifting reliance from PNG to LNG imports in the EU + UK was driven by the EU's targeted reduction in gas imports from Russia.

Figure 102: 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

Table 6 below provides data on the gas supply and demand balance for the EU + UK for the month of June 2023.

Table 6: EU + UK gas supply/demand balance for June 2023 (bcm)

	2022	Jun-22	Jun-23	YTD 2022	YTD 2023	Change* y-o-y	Change** 2023/2022
(a) Gas Consumption	417.40	24.00	20.90	234.00	207.90	-13%	-11%
(b) Gas Production	72.72	5.63	4.95	36.97	33.20	-12%	-10%
Difference (a) - (b)	344.68	18.37	15.95	197.03	174.70	-13%	-11%
PNG Imports	230.46	18.14	12.22	130.74	87.59	-33%	-33%
Regasified LNG	146.57	10.99	11.66	71.91	78.37	6%	9%
Net Withdrawals	-31.79	-11.28	-8.57	-4.58	5.99	-24%	-231%
Variation	-0.55	0.52	0.64	-1.04	2.76		

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

Note: variation refers to statistical differences and losses

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

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

## 6.2 OECD

Table 7 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 March 2023.

**Table 7: OECD's gas supply/demand balance for March 2023 (bcm)**

	2022	Mar-22	Mar-23	YTD 2022	YTD 2023	Change* y-o-y	Change** 2023/2022
(a) OECD Gas Consumption	1804.0	170.1	168.0	559.7	528.3	-1.2%	-5.6%
(b) OECD Gas Production	1651.0	137.2	144.6	399.3	420.5	5.4%	5.3%
Difference (a) - (b)	153.0	32.8	23.5	160.4	107.8	-28.6%	-32.8%
OECD LNG Imports	346.9	30.8	30.1	92.9	95.3	-2.2%	2.6%
LNG Imports from GECF	161.8	13.5	13.7	41.6	43.0	0.8%	3.2%
LNG Imports from Non-GECF	185.1	17.2	16.4	51.2	52.3	-4.6%	2.2%
OECD LNG Exports	223.2	19.5	20.8	55.6	59.5	6.8%	7.0%
Intra-OECD LNG Trade	152.7	14.1	13.7	41.6	42.4	-3.4%	1.7%
OECD Pipeline Gas Imports	630.2	64.4	44.5	178.2	134.1	-30.9%	-24.8%
OECD Pipeline Gas Exports	561.5	52.7	41.2	148.1	125.5	-21.8%	-15.2%
Stock Changes and losses	39.5	-9.9	-10.9	-93.0	-63.5		

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

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

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

## 6.3 India

Table 8 below provides data on the gas supply and demand balance for India for the month of May 2023.

**Table 8: India's gas supply/demand balance for May 2023 (bcm)**

	2022	May-22	May-23	YTD-2022	YTD-2023	Change* y-o-y	Change** 2023/2022
(a) India Gas Demand	60.96	5.78	5.07	25.57	25.10	-12.4%	-1.8%
(b) India Gas Production	33.46	2.85	2.84	13.78	13.91	-0.3%	0.9%
Difference (a) - (b)	27.50	2.94	2.23	11.78	11.20	-24.1%	-5.0%
India LNG Imports	28.07	2.92	2.86	12.01	11.88	-2.0%	-1.1%
LNG Imports from GECF	22.15	2.04	2.16	10.11	9.61	5.7%	-4.9%
LNG Imports from Non-GECF	5.92	0.87	0.70	1.90	2.27	-20.1%	19.6%
Stock Changes and losses	0.57	-0.02	0.63	0.23	0.69		

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

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

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

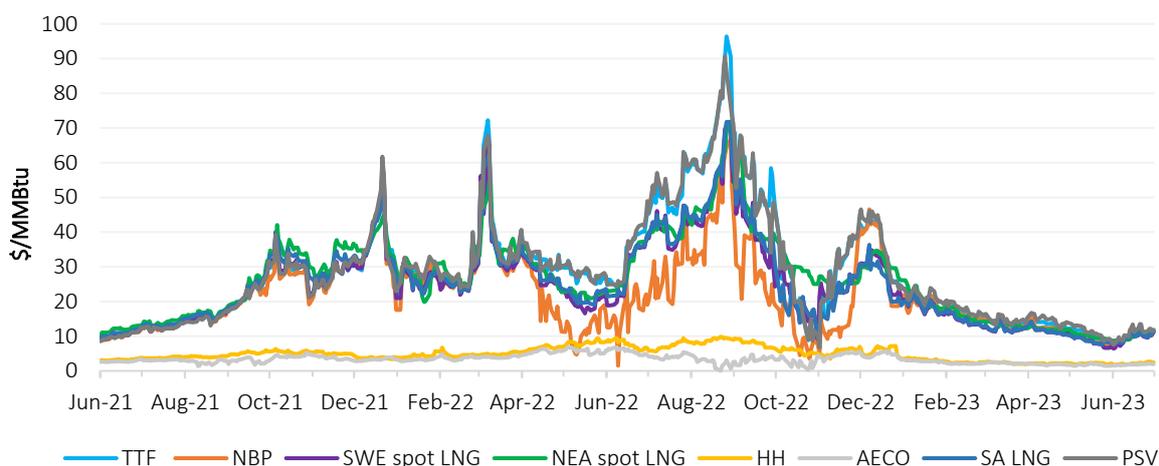
## 7 Energy Prices

### 7.1 Gas Prices

#### 7.1.1 Gas & LNG Spot Prices

In June 2023, gas and LNG spot prices in Europe and Asia experienced a minor uptick following a steady consecutive decline for the previous five months. Additionally, spot price volatility was slightly higher as prices reacted to announcements of extended maintenance activities at several gas and LNG facilities (Figure 103 and Figure 104). However, the global gas market fundamentals remain relatively weak due to tepid demand in both Asia and Europe and high EU gas storage levels. Spot prices may find support in the summer months due to warmer weather, as this will increase gas demand for cooling, as well as any significant maintenance activities that may occur.

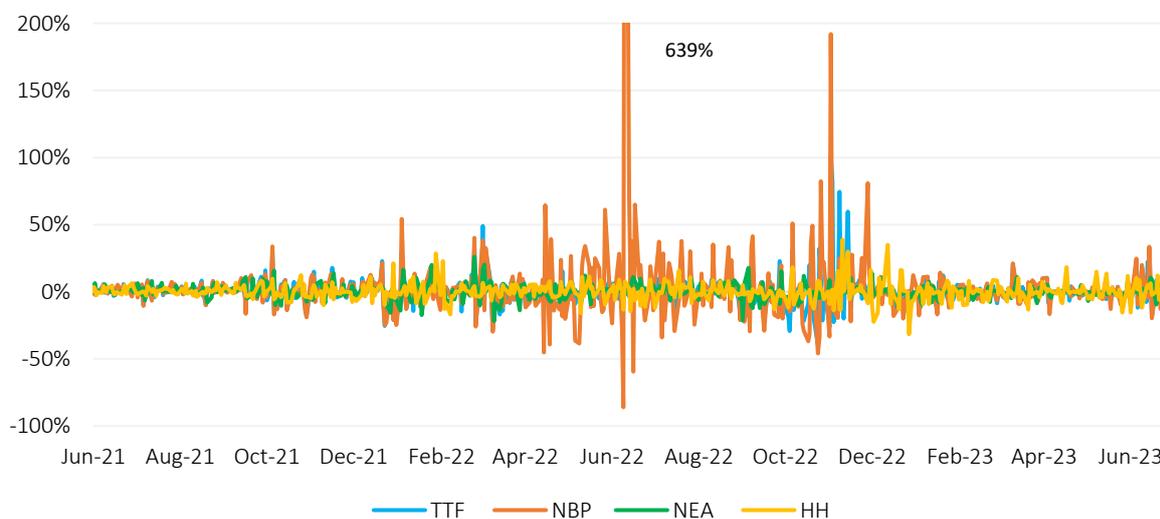
Figure 103: Daily gas & LNG spot prices



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 104: 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 June 2023, average TTF and NBP spot gas prices were \$10.34/MMBtu (3% increase m-o-m) and \$10.09/MMBtu (11% increase m-o-m), as shown in Figure 105. However, these spot prices were lower by 69% y-o-y for TTF and 41% y-o-y for NBP. The SWE spot LNG prices averaged \$9.65/MMBtu in May 2023, marking a 14% increase m-o-m and a 66% decrease y-o-y. As for the PSV spot price, it averaged \$10.96/MMBtu in June 2023, relatively stable m-o-m, but a 68% decline y-o-y.

European gas and LNG spot prices experienced some bullish movement due to maintenance activities at upstream and LNG facilities. In Norway, maintenance at the Nyhamna gas processing plant, which has been offline since May 19, 2023, was extended until July 15, 2023, due to cooling system issues. Additionally, maintenance plans at several Norwegian gas fields were extended, while the Hammerfest LNG facility had an extended outage until June 14, 2023. The reduction in LNG sendout from France and partial maintenance at the Sabine Pass terminal in the US also contributed to supporting prices. Furthermore, daily TTF spot prices reached a three-month high, peaking at \$13/MMBtu.

For the first half of 2023, TTF and NBP averaged \$14.10/MMBtu and \$13.35/MMBtu, respectively, representing substantial declines of 55% and 44% y-o-y.

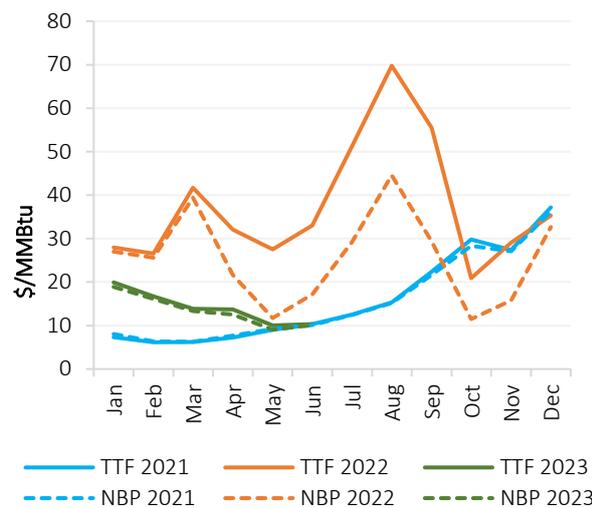
### 7.1.1.2 Asian Spot LNG Prices

In June 2023, the average North East Asia (NEA) spot LNG price experienced a minimal increase of 1% m-o-m, reaching an average of \$10.09/MMBtu. This represents a 66% decrease compared to the same period last year (Figure 106).

Asian LNG prices witnessed a slight increase, tracking gains in European hub prices. Moreover, daily NEA spot LNG prices surpassed the \$11/MMBtu mark. There has been growing interest from buyers in Pakistan, Bangladesh and India who are seeking cargoes for delivery in the coming months.

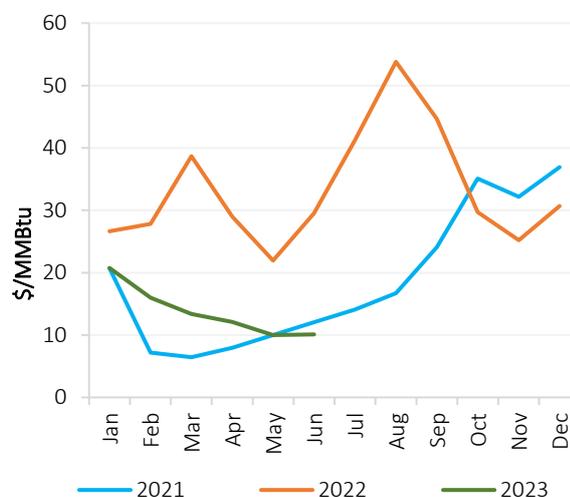
For the first half of 2023, the average NEA spot LNG price stood at \$13.71/MMBtu, representing a 53% y-o-y decrease.

Figure 105: Monthly European spot gas prices



Source: GECF Secretariat based on data from Refinitiv Eikon

Figure 106: Monthly Asian spot LNG prices



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

### 7.1.1.3 North American Spot Gas Prices

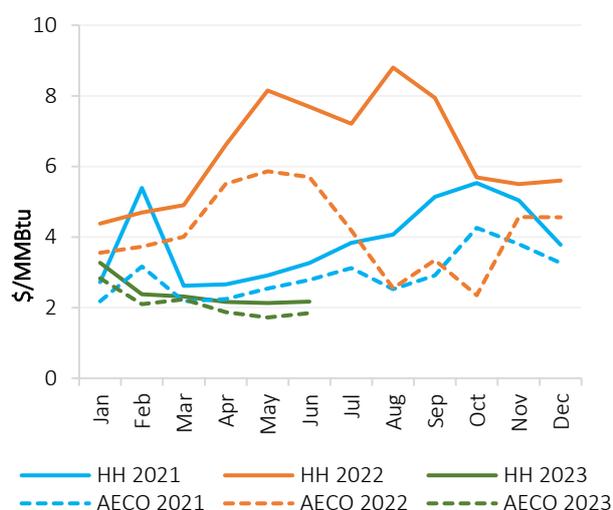
In June 2023, the HH spot gas price averaged \$2.17/MMBtu, reflecting a 2% m-o-m increase. However, it was significantly lower y-o-y, dropping by 72%, compared to the average price of \$7.69/MMBtu observed in June 2022. (Figure 107).

Henry Hub prices received support from above-average temperatures which resulted in increased gas demand for cooling throughout the month. However, gas storage levels remained higher than the five-year average. Notably, daily HH spot prices reached a five-month high of \$2.71/MMBtu during the period.

Similarly, in Canada, the AECO spot price increased by 7% m-o-m, averaging \$1.84/MMBtu in June 2023, however it was 68% lower y-o-y.

For the first half of 2023, the HH spot price averaged \$2.40/MMBtu, representing a significant 60% y-o-y decrease. The AECO spot price averaged \$2.10/MMBtu, marking a substantial 56% y-o-y decrease.

Figure 107: Monthly North American gas spot prices



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

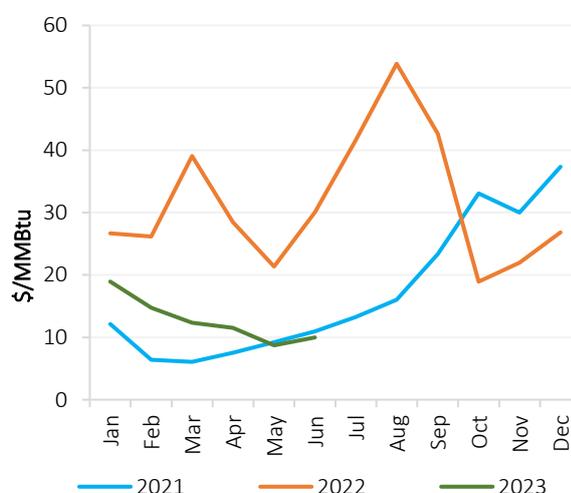
### 7.1.1.4 South American Spot LNG Prices

In June 2023, the South American (SA) LNG price experienced a 14% m-o-m increase, averaging \$9.97/MMBtu. However, this price was 67% lower compared to the average price of \$30.06/MMBtu observed in June 2022 (Figure 108).

LNG spot prices in South America continued to align with the trends observed in European and Asian spot prices. The average delivered prices for LNG in Argentina, Brazil and Chile averaged \$10.08/MMBtu, \$9.74/MMBtu and \$10.10/MMBtu, respectively.

For the first half of 2023, the SA LNG spot price averaged \$12.70/MMBtu, marking a substantial 56% y-o-y decrease.

Figure 108: 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 June 2023, the average Oil-indexed I LNG price was \$12.47/MMBtu, representing a decrease of 2% m-o-m and a 20% y-o-y. Similarly, the Oil-indexed II LNG price averaged \$9.19/MMBtu, showing a 3% m-o-m and a 25% y-o-y decrease (Figure 109). Additionally, the Oil-indexed I prices held an average premium of \$2/MMBtu over NEA spot LNG prices. Meanwhile, the Oil-indexed II prices maintained a discount of \$1/MMBtu compared to the average NEA spot LNG prices.

In Europe, the Oil-indexed III price averaged \$9.37/MMBtu in June 2023, reflecting a 2% m-o-m decrease, but a 6% y-o-y increase (Figure 110). Moreover, the price spread between the average SWE LNG and Oil-indexed III prices was negligible.

For the first half of 2023, the Oil-indexed I LNG price exhibited a 3% y-o-y decrease, while the Oil-indexed II LNG price demonstrated a 12% y-o-y decrease. Additionally, the Oil-indexed III LNG price for the same period experienced an 11% y-o-y increase.

Figure 109: Asia: Spot and oil-indexed price spread

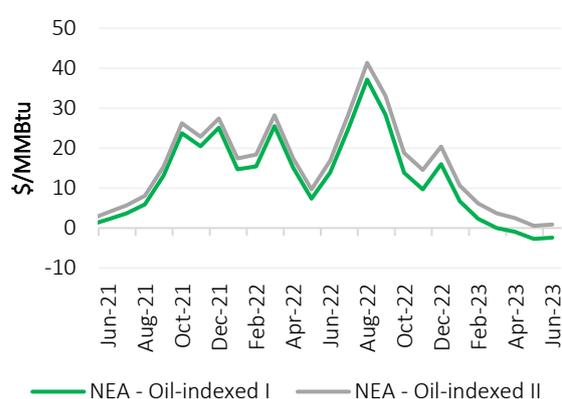
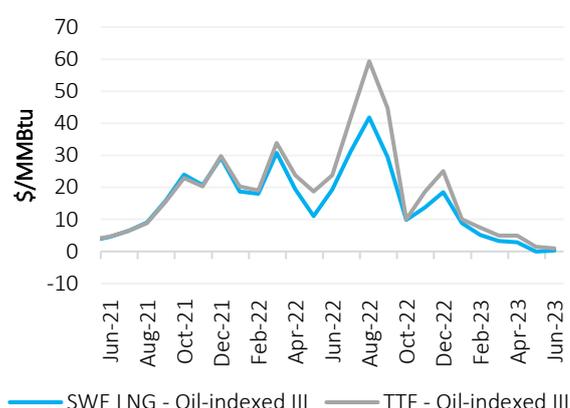


Figure 110: Europe: Spot and oil-indexed price spread



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 June 2023, the average NEA-TTF price spread remained negative, and slightly widened to \$0.25/MMBtu (Figure 111). Both NEA LNG and TTF spot prices gained some momentum during the month, with TTF spot prices experiencing a more significant increase.

NBP traded at a discount of \$0.25/MMBtu compared to TTF, which was lower than the average discount of \$0.97/MMBtu in the previous month (Figure 112). The NBP-TTF spread narrowed due to a sharp increase in NBP prices, attributed to a tightening balance in the UK.

Furthermore, the NWE LNG spot price traded at a narrower discount of \$0.64/MMBtu compared to TTF (Figure 113). Ongoing maintenance activities reduced LNG sendout in the region. The NWE LNG-SA LNG price spread was slightly negative, averaging \$0.27/MMBtu (Figure 114). The NEA-HH and TTF-HH spreads widened to \$7.92/MMBtu and \$8.17/MMBtu, respectively (Figure 115 and Figure 116). Thus, European and Asian spot prices held a higher premium over North American spot prices during the month.

Figure 111: NEA-TTF price spread

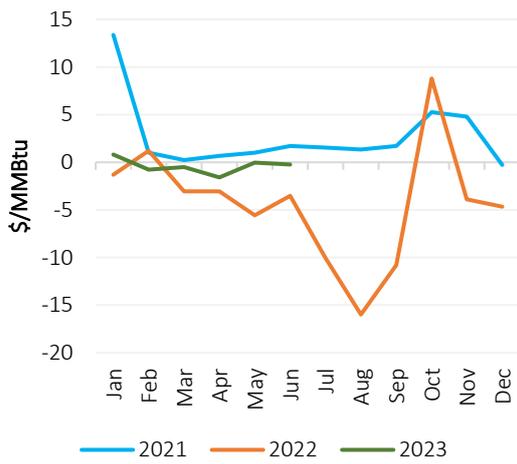


Figure 112: NBP-TTF price spread

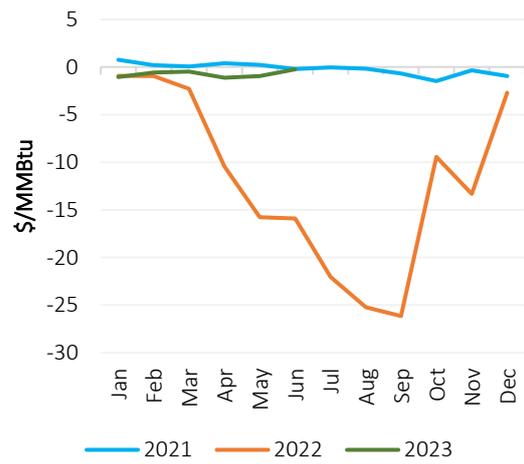


Figure 113: NWE LNG-TTF price spread

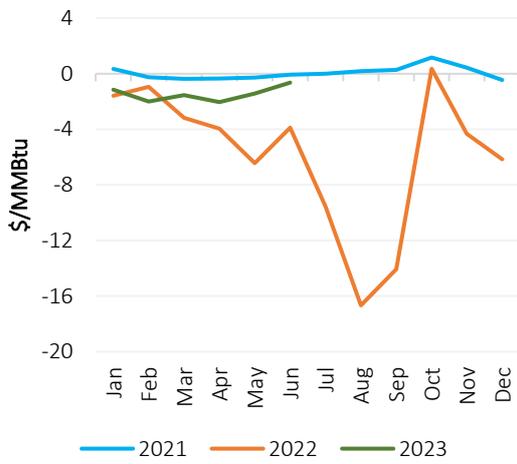


Figure 114: NWE LNG – SA LNG price spread

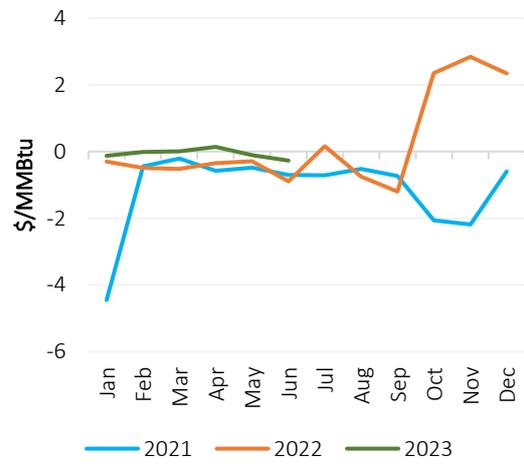


Figure 115: NEA-HH price spread

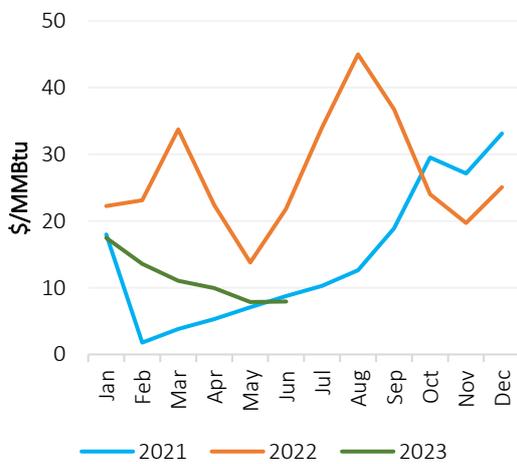
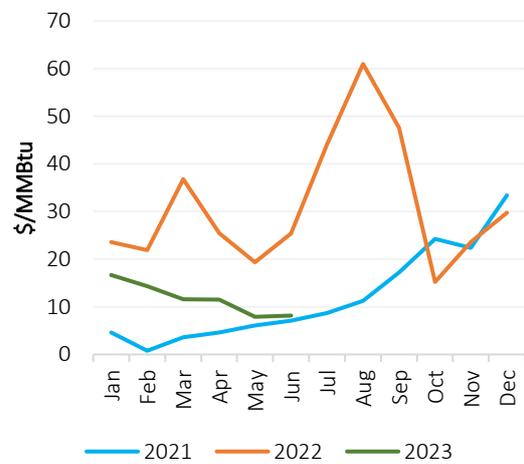


Figure 116: TTF-HH price spread



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

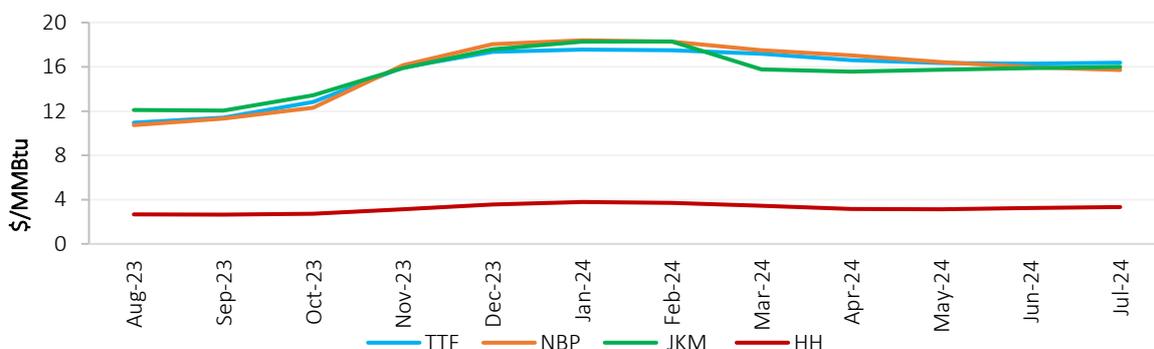
### 7.1.4 Gas & LNG Futures Prices

The JKM-TTF futures price spread for the remainder of 2023 is positive, suggesting that Asian LNG prices may maintain a small premium over European spot prices in the coming months, presenting potential arbitrage opportunities. In August 2023, JKM is expected to trade at an average premium of \$1.1/MMBtu compared to TTF. Subsequently, in Q4 2023, the JKM-TTF spread is expected to remain positive, but narrow, with an average of \$0.3/MMBtu. However, in January and February 2024, the spread is projected to slightly widen to \$0.7/MMBtu (Figure 117).

With regard to the disparity between the TTF and NBP spot prices, NBP is expected to persistently trade at a discount to TTF, albeit at a narrow discount of -\$0.8/MMBtu over the next three months. In November 2023, the spread is expected to turn slightly positive, with NBP potentially gaining a slight premium of around \$0.2/MMBtu.

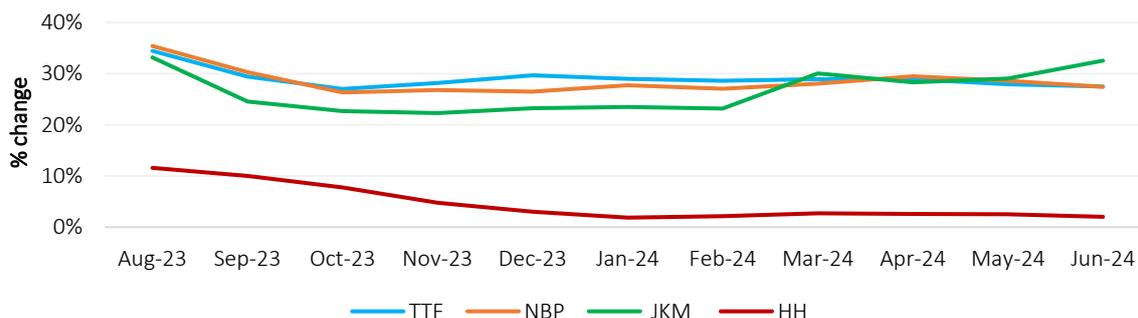
For the 6-month period from August 2023 to January 2024, gas and LNG futures prices for TTF, NBP and JKM (as of July 6, 2023) were all higher than the expectations of the futures prices considered on June 7, 2023 (as reported in the GECF MGMR June 2023). Moreover, as of July 6, 2023, the average futures prices for TTF, NBP and JKM during the same 6-month period were \$14.34/MMBtu, \$14.49/MMBtu and \$14.89/MMBtu, respectively. Meanwhile, the average HH futures price was \$3.08/MMBtu, which was also higher than previous expectations (Figure 118).

Figure 117: Gas & LNG futures prices



Source: GECF Secretariat based on data from Refinitiv Eikon  
 Note: Futures prices as of July 6, 2023.

Figure 118: Variation in gas & LNG futures prices



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

## 7.2 Cross Commodity Prices

### 7.2.1 Oil Prices

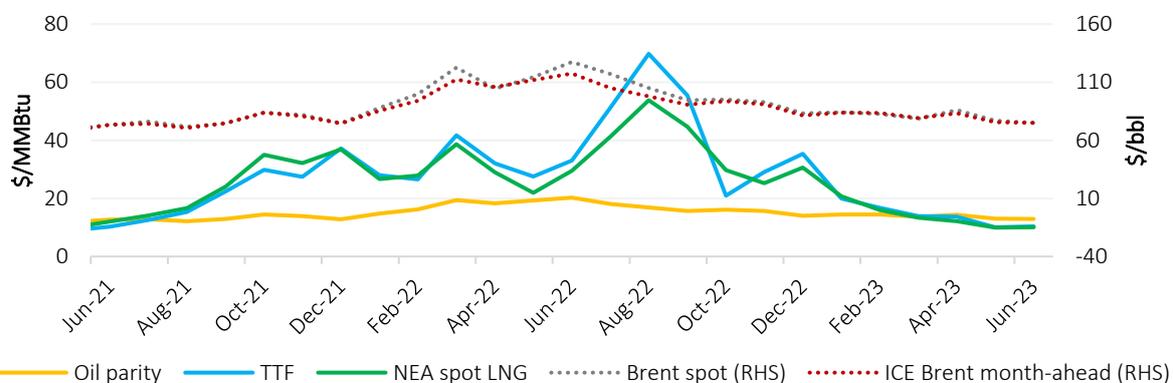
In June 2023, the average Brent spot price was \$75.10/bbl, indicating a decrease of 2% m-o-m and a 41% y-o-y (Figure 119). The Brent month-ahead price averaged \$74.98/bbl, marking a 1% decrease m-o-m, and a 36% decrease y-o-y.

Oil prices faced downward pressure due to increasing concerns with global economic growth and oil demand. In China, a weak macroeconomic outlook and slowing activity in the manufacturing sector exerted a negative influence on oil prices. The National Bureau of Statistics (NBS) reported that China's official PMI remained below 50 for the third consecutive month, indicating a contraction in the manufacturing sector.

Furthermore, in June 2023, both TTF and NEA LNG spot prices continued to trade at a discount to the oil parity price of \$2.6/MMBtu and \$2.8/MMBtu, respectively.

For the first half of 2023, the average Brent spot price was \$80.60/bbl, representing a 24% decrease y-o-y. Similarly, the average Brent month-ahead price was \$80.12/bbl, representing a 22% decrease y-o-y.

Figure 119: Monthly crude oil prices



Source: GECF Secretariat based on data from Argus and 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

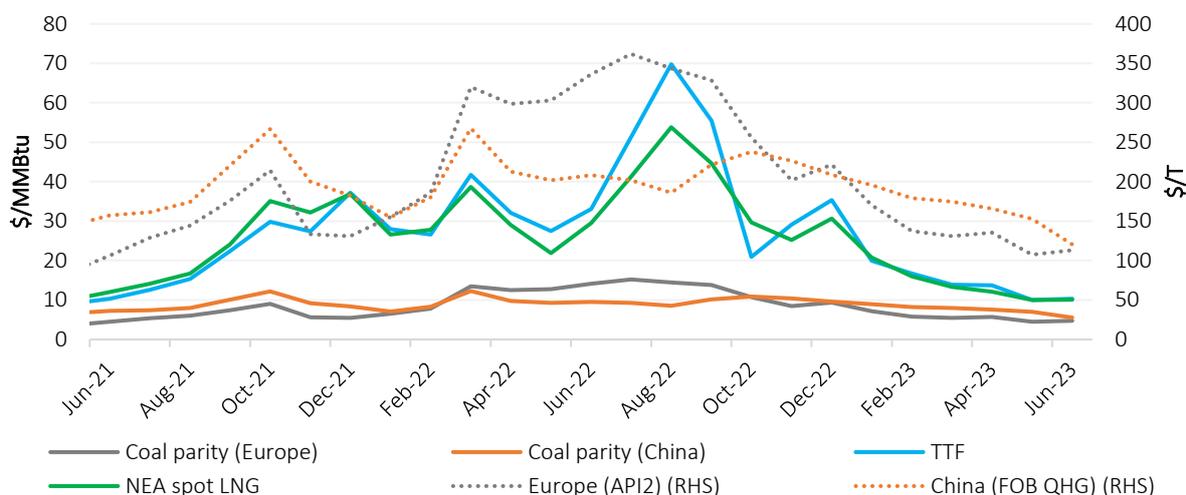
In June 2023, the European coal price (API2) experienced a 5% m-o-m increase, averaging \$113.02/T, but was 66% lower y-o-y. Meanwhile, in China, the QHG coal price marker decreased by 21% m-o-m and 42% y-o-y, averaging \$120.56/T, (Figure 120).

European coal prices followed the upward trend in TTF gas prices. However, despite the increase compared to the previous month, European coal prices remained at two-year lows. In China, sluggish industrial demand and exceptionally high coal inventories exerted downward pressure on coal prices, causing them to plummet to their lowest level since March 2021.

The premium of TTF spot price over the API2 parity price increased by 1% m-o-m to \$5.6/MMBtu in June 2023. Additionally, the premium of NEA spot LNG price over the QHG parity price increased by 53% m-o-m to \$4.6/MMBtu.

For the first half of 2023, the European API2 averaged \$132.40/T, representing a 50% decrease y-o-y. Meanwhile, the Chinese QHG price averaged \$164.75/T, which was 19% lower y-o-y.

Figure 120: 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.

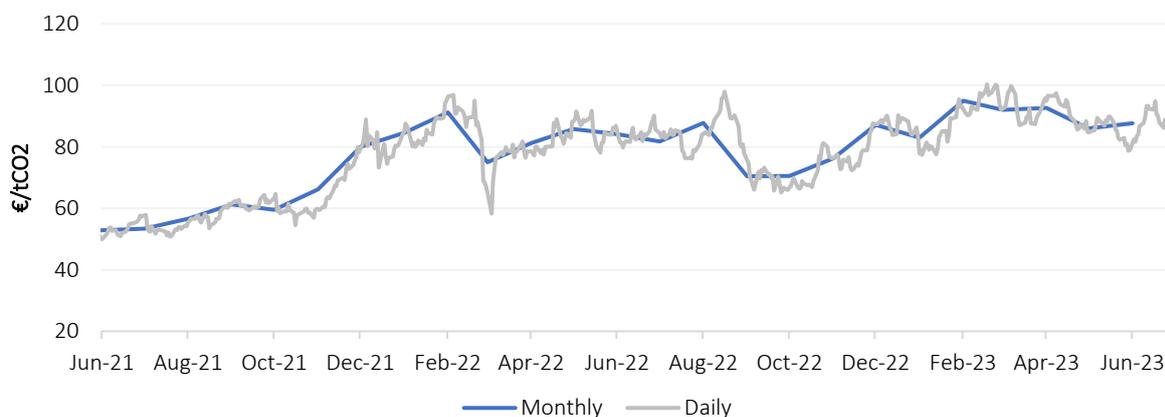
### 7.2.3 Carbon Prices

In June 2023, EU carbon prices averaged €87.65/tCO<sub>2</sub>, reflecting a 2% m-o-m increase and a 4% increase compared to the same period last year (Figure 121).

EU carbon prices were bolstered by higher TTF prices and improved market fundamentals, driven by increased demand for cooling due to warmer weather. Additionally, lower wind output and limited nuclear availability provided support to thermal generation, thereby boosting carbon prices.

For the first half of 2023, EU carbon prices averaged €89.42/tCO<sub>2</sub>, representing a 7% increase y-o-y.

Figure 121: EU carbon prices



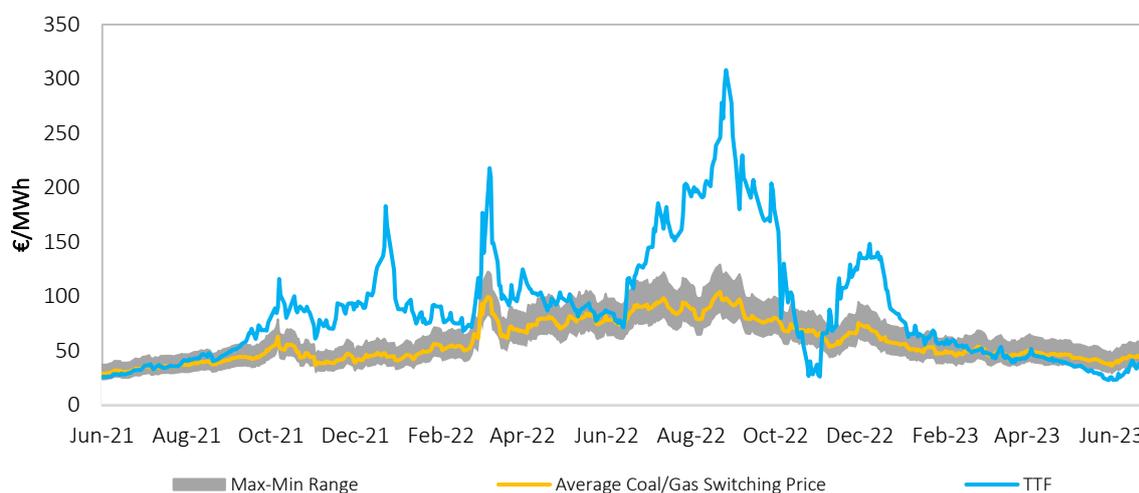
Source: GECF Secretariat based on data from Refinitiv Eikon

## 7.2.4 Fuel Switching

In June 2023, daily TTF spot prices remained below the range suitable for coal-to-gas switching, with an average coal-to-gas switching price of €42.58/MWh, marking a 3% m-o-m increase. The average monthly spread between the TTF spot price and the coal-to-gas switching price remained negative and widened to approximately -€11/MWh (Figure 122).

Looking ahead to August 2023, the TTF spot price is expected to remain slightly below or within the coal-to-gas switching range. The anticipated low gas spot prices will likely continue to support coal-to-gas switching in Europe.

Figure 122: Daily TTF vs coal-to-gas switching prices



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, CO<sub>2</sub> 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

**European Union:** European Union countries were unable to reach a consensus on the proposed new rules for the bloc's power market during the two meetings held on June 19 and 30, 2023. The disagreement arose over a proposal to extend subsidies for coal plants and increasing state aid for other power plants. EU energy ministers, convening in Luxembourg, concluded discussions without agreeing on a unified stance on the reforms which are aimed at stabilising power prices to prevent a recurrence of last year's energy crisis. Once the member states agree on a common position, they must negotiate the final law with the EU Parliament. The latest proposal would have also allowed nations to implement national schemes until mid-2024 to recover windfall revenues from some power plants if there is an increase in power prices. The move was supported by countries including Greece and Spain.

In other developments, some European buyers, including German utility EnBW and German gas and power company MET, have alluded to the key role of long-term LNG contracts to secure gas supply for Europe at the recent BDEW congress 2023 in Berlin, Germany. Peter Heydecker, Head of Trading at EnBW, stated that long-term LNG supply contracts incentivize infrastructure investments and reduce exposure to spot prices. Additionally, Jorg Selbach-

Rontgen, Chief Executive at MET Germany GmbH, supported the utilisation of long-term LNG contracts, as it reduces the risk of competing with buyers in Asia for spot supply.

In addition, Alfred Stern, CEO of the Austrian energy group OMV, has stated that his company will continue to source the majority of its natural gas supplies from Russia during the winter of 2023/2024, even though it has signed contracts with other suppliers. The long-term supply contract with Gazprom was signed in 2018, and is set to expire in 2040.

*Singapore:* Singapore's Energy Market Authority (EMA) is planning to implement a temporary wholesale electricity price cap starting July 1, 2023. This move aims to protect electricity retailers, and consequently businesses and households, from high and volatile LNG prices. In late 2021, high LNG prices led to the closure of as many as six electricity retailers in Singapore. Approximately 95% of Singapore's electricity is produced from natural gas, with LNG sourced on a term basis. The price cap will be determined using a formula that references natural gas and generation costs (EMA did not provide further details).

*China:* China's LNG futures project has received approval and may be launched on the Shanghai International Energy Exchange (INE) by the end of the year. Contracts will be traded in units of 1,000 MMBtu per lot and will be settled in Chinese yuan, with a minimum margin of 10% of the contract value. The LNG futures will be on physical delivery, with prices fluctuating in accordance with the spot market. Sellers will deliver via the designated depot, while buyers can arrange pickups in several ways, such as trucking, vessel loading or gasification into pipelines. The selection of delivery depots has been finalized, and consultations with various relevant departments and market participants have been concluded.

Following the implementation of a new mechanism that links retail residential gas prices with distributors' fuel purchasing costs, residential natural gas prices in several Chinese cities have seen an increase. This price adjustment comes in response to a policy guideline issued by the National Development and Reform Commission (NDRC) in early June 2023. According to the guidelines, retail residential gas prices can be readjusted once or twice a year to align with the procurement costs for city-gas distributors. In contrast, non-residential prices may fluctuate on a quarterly or monthly basis. Furthermore, the purchase costs for city-gas distributors will be determined by averaging the expenses associated with different supply sources, including piped gas, LNG and compressed natural gas.

## 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
CNG	Compressed Natural Gas
CO <sub>2</sub>	Carbon dioxide
CO <sub>2e</sub>	Carbon dioxide equivalent
CPI	Consumer Price Index
DOE	Department of Energy
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

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

<b>QHG</b>	Qinhuangdao
<b>R-LNG</b>	Regasified LNG
<b>SA</b>	South America
<b>SPA</b>	Sales and Purchase Agreement
<b>SWE</b>	South West Europe
<b>T&amp;T</b>	Trinidad and Tobago
<b>TANAP</b>	Trans-Anatolian Natural Gas Pipeline
<b>TCFD</b>	Task Force on Climate-Related Financial Disclosure
<b>Tcm</b>	Trillion cubic metres
<b>tCO<sub>2</sub></b>	Tonne of carbon dioxide
<b>TTF</b>	Title Transfer Facility
<b>TWh</b>	Terawatt hour
<b>UGS</b>	Underground Gas Storage
<b>UAE</b>	United Arab Emirates
<b>UK</b>	United Kingdom
<b>UQT</b>	Upward Quantity Tolerance
<b>US</b>	United States
<b>y-o-y</b>	year-on-year

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