MONTHLY GAS MARKET REPORT

August 2023

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About GECF

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.

Contributors

Project Leader

- Aydar Shakirov, Head of Gas Market Analysis Department (GMAD)

Experts Team (In Alphabetical Order)

- Adrian Sookhan, Gas Market Analyst, GMAD
- Amin Shokri, Energy Analyst, GMAD
- Hossam ElMasry, Research Assistant, GMAD
- Imran Mohammed, Gas Transportation and Storage Analyst, GMAD
- Rafik Amara, Senior Gas Market Analyst, GMAD
- Sandy Singh, Market Research Analyst, GMAD

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Tornado Tower, 47th & 48th Floors, West Bay, Doha, Qatar

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Highlights

Global economy: The global GDP growth forecast for 2023 has been maintained at 2.4% by Oxford Economics. However, China's GDP growth forecast has been revised downwards by 0.4 percentage points to 5.1% due to slower-than-expected economic growth in the second quarter. Global inflation is expected to gradually ease to 5.9% in 2023 as the impact of tight monetary policies take effect, as well as weaker commodity prices and easing of supply chain issues.

Gas consumption: In July 2023, the European Union witnessed a substantial 12% year-on-year decline in gas consumption to reach 18 bcm. The rise in renewable energy production, especially solar, contributed to a reduced reliance on gas in the EU's power generation mix. Despite the decrease in gas prices throughout the month, the industrial sector's demand has not yet returned to levels observed in previous years. In contrast, China's apparent gas consumption surged by 11% year-on-year, totalling 33 bcm. Gas consumption in the United States increased by 0.2% year-on-year, reaching 73 bcm.

Gas production: In June 2023, Europe's gas production experienced a y-o-y drop of 19%, resulting in a total output of 12.7 bcm. This reduction was mainly attributed to decreased production from the region's top producers, namely Norway and the UK. In addition, shale gas output extracted from the seven major regions in the US observed a 4% y-o-y increase in July 2023, resulting in a total production of 85.5 bcm. The global count of gas rigs, a measure of upstream activity, saw a m-o-m increase of 28 units and a y-o-y increase of 34 units in July 2023, bringing the total to 400 units. In June 2023, approximately 460 million boe of hydrocarbon volumes were discovered, taking the cumulative discovered volumes in the first half of 2023 to 2.6 billion boe, down from 4 billion boe in H1 2022.

Gas trade: In July 2023, pipeline gas imports to the EU reversed the recent declining trend, rising by 16% m-o-m to reach 13.5 bcm. Simultaneously, global LNG imports experienced a modest uptick of 0.3% y-o-y, reaching a total of 32.7 Mt. Robust growth in LNG consumption was observed in the Asia Pacific, Latin America, the Caribbean (LAC) and MENA regions, countering the sluggish European LNG imports and driving the overall global increase. Notably, Europe registered its first y-o-y decline in LNG imports since September 2021, attributed to reduced gas demand, heightened gas storage levels and an expanding price gap between spot LNG in the Asia Pacific and Europe. Adding to these developments, July 2023 witnessed Vietnam's entry into the group of LNG importers as it received its inaugural LNG shipment through the Thi Vai LNG terminal.

Gas storage: The restocking of underground gas storage sites continues in both Europe and North America, albeit at a reduced rate of stock buildup. As of July 2023, the gas volume of gas in storage in the European Union increased to 85.4 bcm, representing 82% of the region's storage capacity. Similarly, in the United States, the volume of gas in storage increased to 84.2 bcm, accounting for 63% of the country's capacity. Meanwhile, the total volume of LNG in storage in Japan and South Korea combined was estimated at 10.4 bcm.

Energy prices: In July 2023, gas and LNG spot prices in Europe and Asia reversed the previous month's gains with overall bearish market fundamentals. The average TTF spot price stood at $9.56/MMBtu, marking an 8% decline compared to the previous month. Meanwhile, the average NEA spot LNG price experienced an increase of 8% m-o-m to reach $10.88/MMBtu. Global gas market fundamentals remain relatively weak due to tepid demand in both Europe and Asia, as well as high EU gas storage levels. However, increasing buying activity from LNG importers in South and Southeast Asia will support prices in the upcoming months.

Feature Article: Analysing the Gas Market Demand Landscape: A Mid-Year Review of the EU, US and China with Short-Term Forecasts

Amid the ever-evolving energy landscape, the gas market continues to draw significant attention from economies worldwide. As we cross the threshold into the year's midpoint, it becomes imperative to evaluate the state of the gas demand landscape within the European Union (EU), the United States (US) and China.

Firstly, in the EU, gas demand decreased by 10.6% in the first half (H1) of 2023, representing a decline of 21 billion cubic meters (bcm). This decline in natural gas consumption was driven by several factors. Chief among them was the exceptionally warm winter that enveloped the EU during the first quarter (Q1) of 2023. Elevated temperatures recorded during this period significantly impacted heating demand in the residential sector. Additionally, the implementation of EU regulations promoting a voluntary 15% reduction in gas demand until March 2023, coupled with its subsequent extension for an additional year (from 1 April 2023 to 31 March 2024), played a pivotal role in suppressing gas consumption in both the residential/commercial and industrial sectors (Figure 1). Despite Germany's complete phasing out of its nuclear sector, France's low availability of nuclear output, and increased coal-to-gas switching as natural gas prices experienced an early decline in 2023, natural gas consumption within the power generation sector declined by 15% year-on-year (Figure 2).

Figure 1: Monthly trend gas consumption in EU

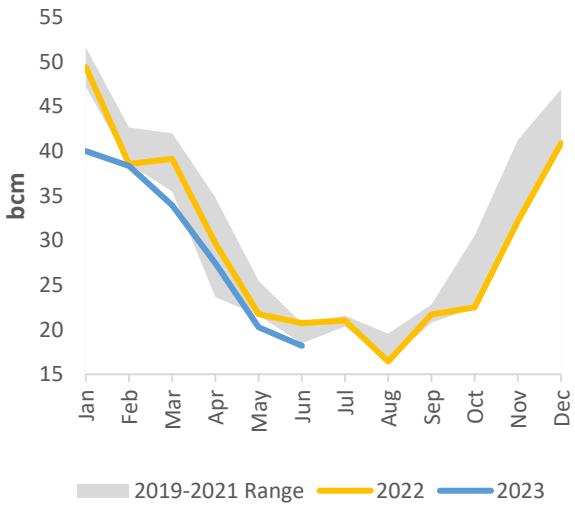
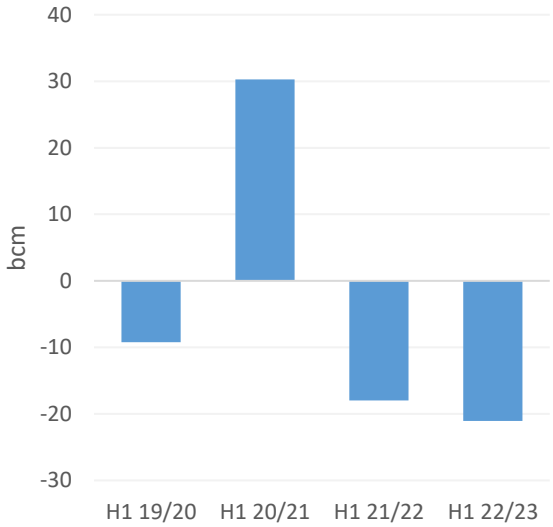


Figure 2: Y-o-Y variation in EU gas consumption



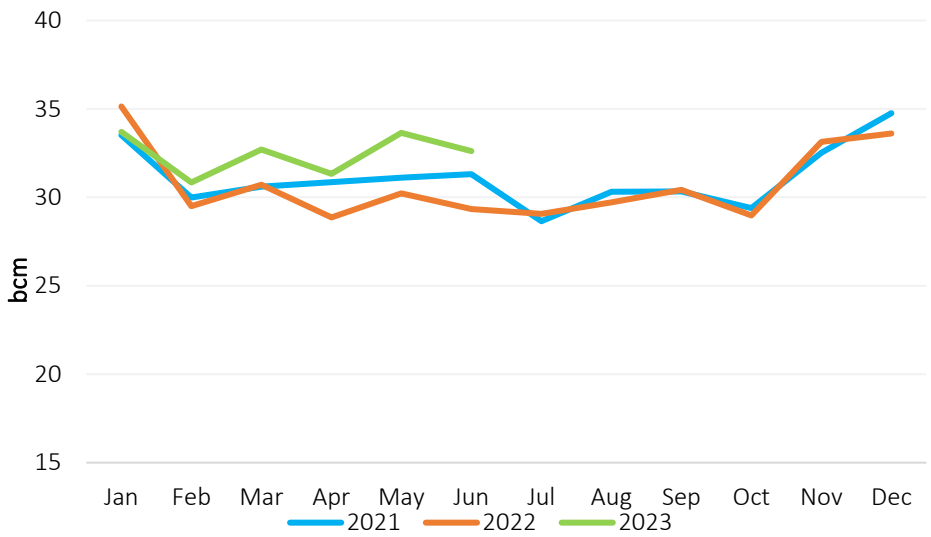
Source: GECF Secretariat based on information from Refinitiv and Mckinsey

Looking ahead to the latter half of the year, the likelihood of observing similar trends in natural gas consumption across Europe remains notably high. This projection can be attributed primarily to the latest weather forecasts, which suggest that Q4 2023 will be characterised by relatively warmer conditions. This anticipated warmth is expected to curtail the gas demand for heating in the residential sector, thereby exerting downward pressure on consumption. Furthermore, the continuation of the EU's regulation promoting voluntary reductions in gas demand is expected to further underpin this trend. Lastly, the demand slump in the industrial sector, which has persisted over the preceding two years (2021/2022),

is unlikely to experience a substantial recovery in the upcoming six months. This was substantiated during the first half of the year, wherein the industrial sector, despite benefiting from falling gas prices in Europe, failed to fully recover to its pre-decline state. For the year 2023, we are projecting a decline in the range of 8% to 10% in comparison to 2022.

Moving eastward, the situation in China presents a stark contrast to that of Europe. The first half of the year witnessed a notable upturn in natural gas consumption, with a 6% year-on-year increase. This equates to a total natural gas consumption of 195 bcm for H1 2023. The surge in China's natural gas consumption can be attributed to several factors. Foremost among them is the rebound in economic activity following the strict COVID-19 lockdown measures enforced in 2022. In addition, there has been an increased reliance on natural gas in the power sector resulting from an 18% year-on-year decrease in hydroelectric availability. Moreover, the heatwave hitting the southern regions of China since May 2023 has amplified cooling demands in China, further contributing to the mounting natural gas consumption within the country (Figure 3).

Figure 3: Monthly gas consumption trend in China



Source: GECF Secretariat based on information from Chinese Customs and Refinitiv

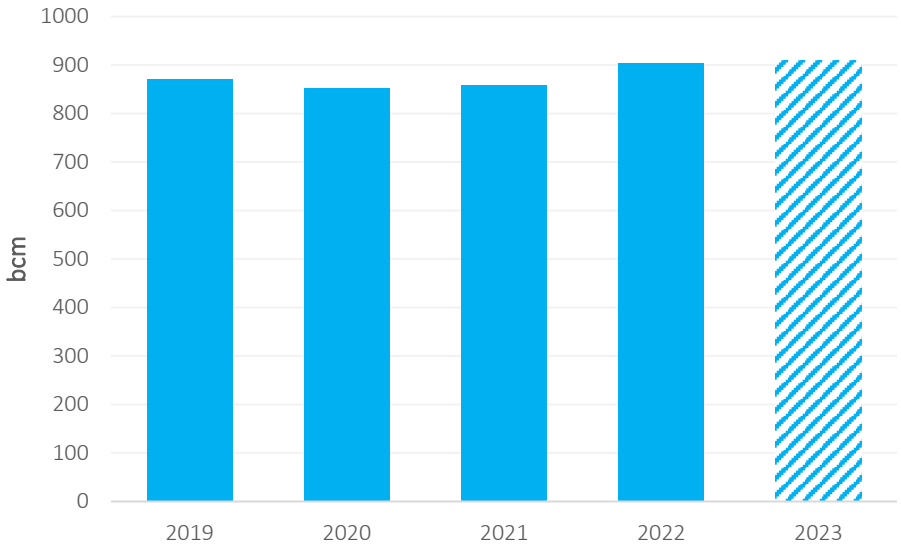
Looking to the second half of the year, China's natural gas consumption is projected to continue its recovery, primarily driven by the industrial sector's recovery facilitated by the easing of COVID-19 restrictions. In the power generation sector, natural gas is set to play a crucial role as a reliable backup for the extensive deployment of solar and wind farms throughout the country. This dynamic is expected to stimulate natural gas consumption in the power generation sector in the years ahead. For the year 2023, we forecast an overall growth of approximately 6% in Chinese natural gas consumption compared to the previous year.

In the United States, natural gas consumption in the first half of the year recorded a modest decline of 0.5%, reaching a total level of 456 bcm. This decline was largely driven by an 8.4% (7 bcm) decrease in the residential sector and a 7.4% (4 bcm) decrease in the industrial sector. The drop in the residential sector was mainly due to the mild winter experienced in the US during Q1 2023. However, an increase of 7% in the power generation sector, representing a

rise of 10 bcm compared to H1 2022, offset the overall decline. This growth in natural gas consumption in the power generation sector was the result of a switch from coal to gas because of lower natural gas prices, a decrease in hydro output due to drought in certain US regions and a reduction in wind output during the same period (Figure 4).

In terms of future expectations, we anticipate that natural gas consumption in the US will continue to recover in the second half of the year. We expect the power generation sector to drive this growth as the ongoing drought situation is expected to persist, and attractive natural gas prices will enhance its competitiveness in the power generation mix compared to coal. For the year 2023, we predict an increase of 0.3 to 0.5% compared to 2022, marking the third consecutive year of growth in the US.

Figure 4: Yearly gas consumption trend in US



Source: GECF Secretariat based on information from EIA and Refinitiv

In several other global regions, we have observed a recovery of gas consumption attributed to the influence of lower spot prices, mainly in price-sensitive countries of South and Southeast Asia.

1 Global Perspectives

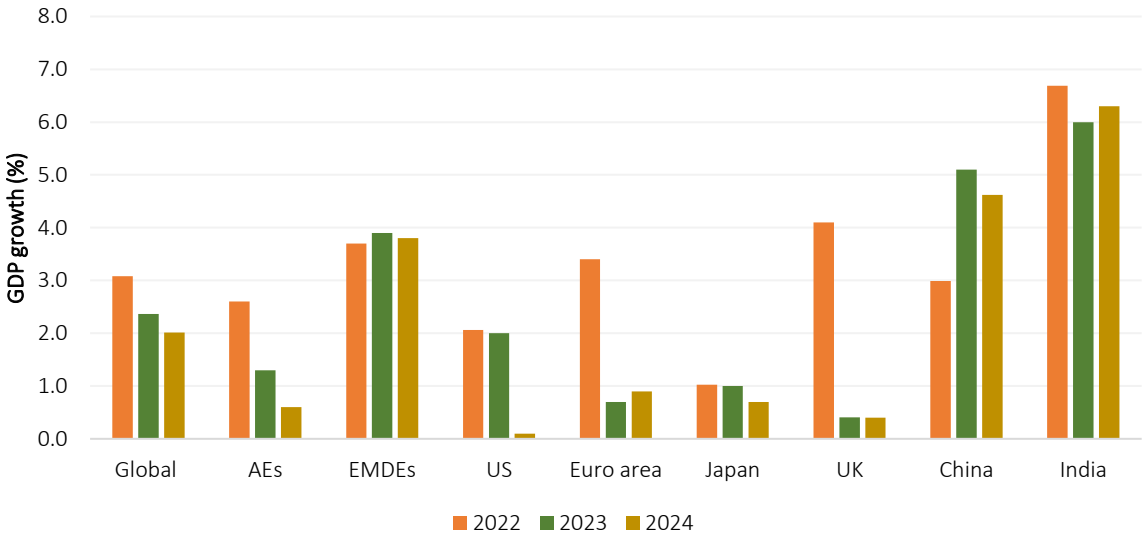
1.1 Global Economy

In its World Economic Prospects August 2023 report, Oxford Economics has maintained its projection for global GDP growth in 2023 at 2.4%. In addition, the global GDP growth forecast for 2024 has also been maintained at 2% (Figure 5).

The outlook for GDP growth in Advanced Economies (AEs) has been adjusted slightly upwards by 0.1 percentage points, with an expected growth rate of 1.3% in 2023. However, a mild deceleration is anticipated, projecting a growth of 0.6% in 2024. In the US, the GDP growth forecast has been raised by 0.2 percentage points to 2% in 2023. The robust performance of the US economy has surpassed expectations, attributed to a strong labour market and consumer spending. Despite these strengths, the economy faces certain challenges that may prevent a soft-landing, such as stringent financing conditions and persistently high inflation. In the Euro area, the GDP growth has been revised upwards by 0.1 percentage points to 0.7% in 2023. This was driven by estimates indicating a marginal expansion in GDP growth during the second quarter. However, weakness in the manufacturing sector, particularly in Germany and Italy, will continue to limit economic growth in the region. As for Japan, its GDP growth forecast for 2023 was revised upwards by 0.1 percentage points to 1%, reflecting its ongoing resilience. Nonetheless, Japan continues to face headwinds from weak external demand.

GDP growth in Emerging Markets and Developing Economies (EMDEs) has undergone a downward revision, leading to a projected GDP growth rate of 3.9% in 2023. This is followed by a slight softening to 3.8% in 2024. This downgrade is largely attributed to the sluggish pace of economic expansion in China in Q2 2023, which may have offset some positive momentum in other countries. China's GDP growth forecast has been revised downwards by 0.4 percentage points to 5.1% in 2023 and 4.6% in 2024. In contrast, India's GDP growth has been revised upwards by 0.3 percentage points to 6% in 2023.

Figure 5: GDP growth forecast



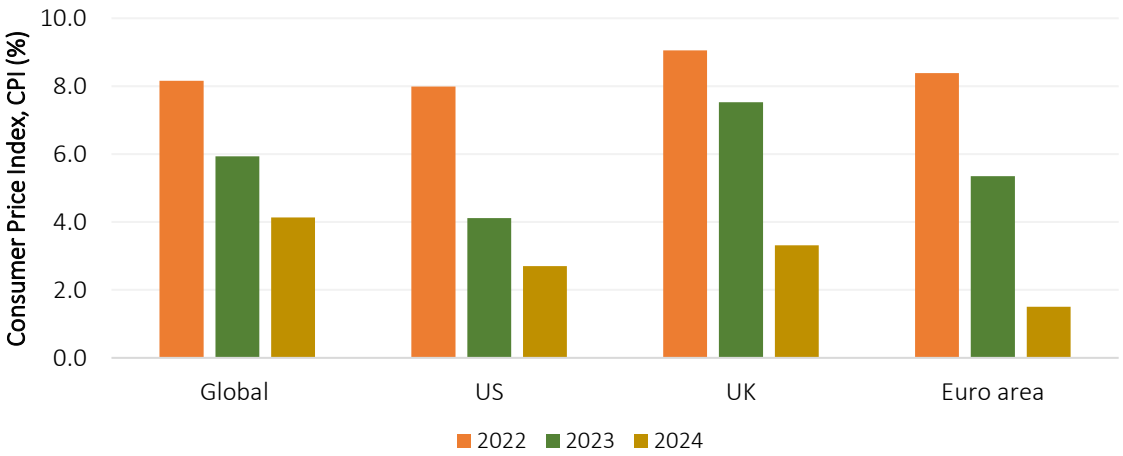
Source: GECF Secretariat based on data from Oxford Economics

In July 2023, the IMF released its World Economic Outlook Update, providing valuable insights into the current global and regional economic prospects, along with the pivotal factors that are poised to shape the immediate trajectory of the global economy. The IMF projects global

GDP growth of 3% in 2023, reflecting an upward revision from its previous forecast of 2.8% in April 2023. However, the report highlighted that, while the global economy was resilient in the first quarter of 2023, the balance of risks remains titled to the downside. Global economic growth will continue to face challenges due to the tightening of monetary policies and high inflation, and the potential implications of any further stress that might emerge within the financial sector.

Inflation is expected to gradually ease in most economies as the impact of tight monetary policies take effect, accompanied by weaker commodity prices and easing of supply chain issues. 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 4.1% 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 1.5% in 2024. The UK is expected to experience inflation averaging 7.5% in 2023, before decreasing to 3.3% in 2024 (Figure 6).

Figure 6: Inflation rates

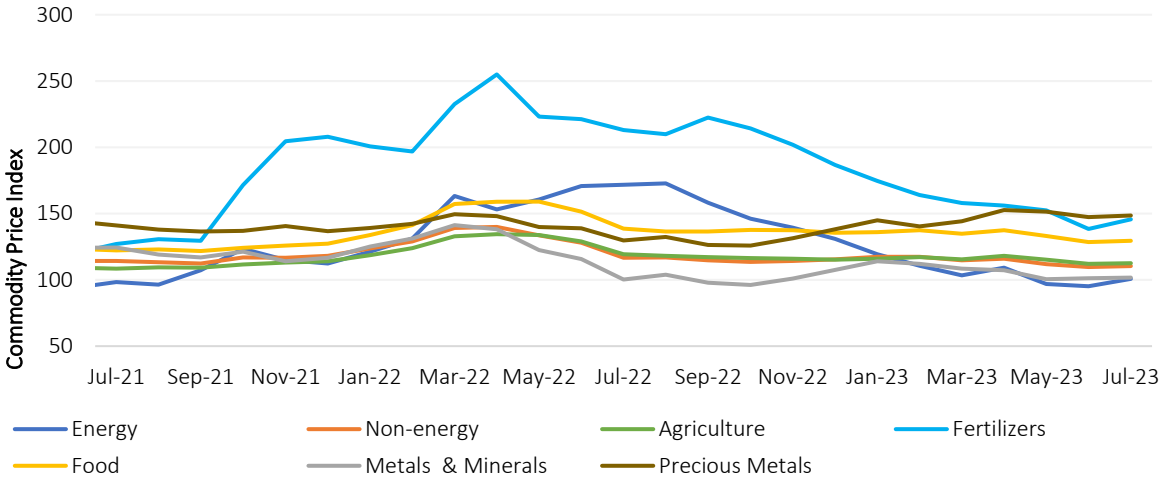


Source: GECF Secretariat based on data from Oxford Economics

In July 2023, commodity prices in both the energy and non-energy sectors reversed their trend by increasing, following two consecutive months of decline. The energy price index increased by 6% m-o-m, but was 41% lower y-o-y. This uptick was driven primarily by stronger oil prices, which averaged $80/bbl, reaching a three-month high. Additionally, coal prices in China also increased compared to the previous month.

The non-energy price index also experienced an increase of 1% m-o-m, but was 5% lower y-o-y. Within the non-energy sectors, the agriculture and precious metals price indices both showed an increase of 1% m-o-m. Additionally, the fertilizer price index experienced an increase of 5% m-o-m, after declining for nine consecutive months, but was 32% lower y-o-y (Figure 7).

Figure 7: Monthly commodity price indices

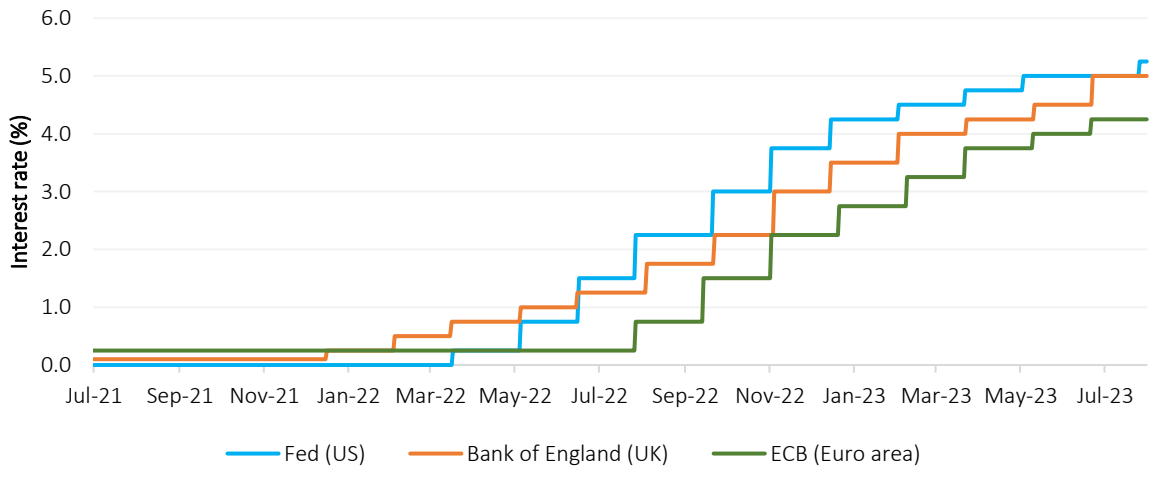


Source: GECF Secretariat based on data from World Bank Commodity Price Data
Note: Monthly price indices based on nominal US dollars, 2010=100. The energy price index is calculated using a weighted average of global crude oil (84.6%), gas (10.8%) and coal (4.7%) prices. The non-energy price index is calculated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

In its most recent meeting on July 27, the US Federal Reserve (Fed) opted to raise interest rates by 0.25 percentage points. This decision followed a pause in rate hikes during their previous meeting in June. As a result, the Fed's benchmark interest rates rose within the range of 5.25% to 5.50% (Figure 8). The Fed cautioned that there is a possibility of a further increase in September and will continue to monitor the data in order to determine its next move.

Similarly, at the beginning of August, both the European Central Bank (ECB) and Bank of England (BOE) raised their key interest rates by 0.25 percentage points. This increase brought the ECB's key interest rates on the main refinancing operations, marginal lending facility and deposit facility are 4.25%, 4.5% and 3.75%, respectively. In the UK, the BOE's key interest rate stood at 5.25% following the increase. Central banks remain focused on meeting their targeted 2% inflation rates.

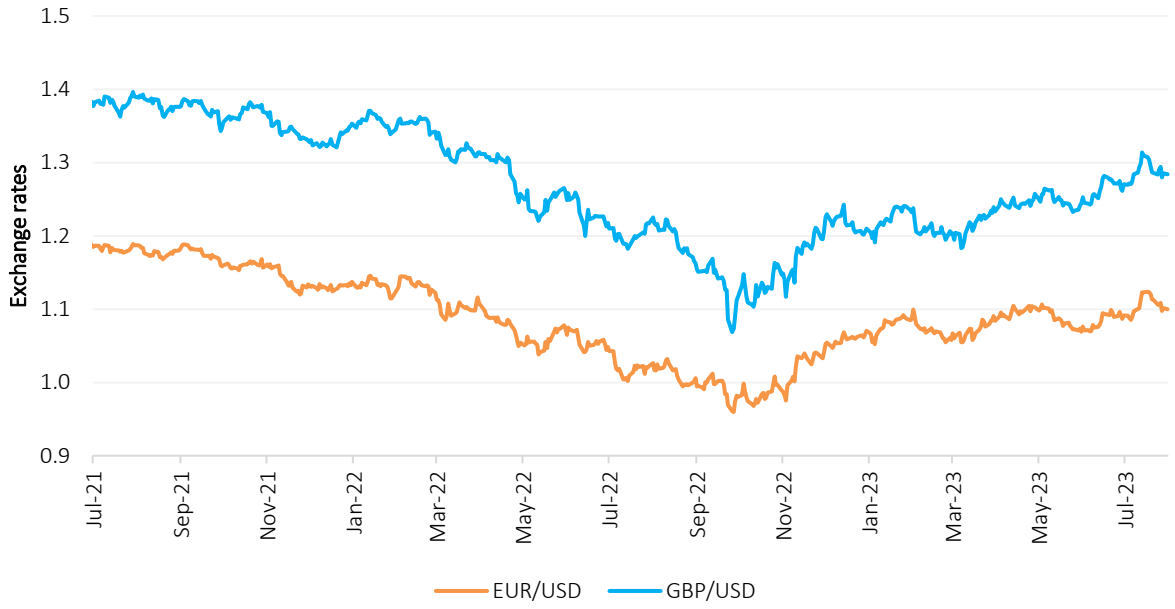
Figure 8: Interest rates in major central banks



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

The euro strengthened against the US dollar in July 2023, with the average exchange rate increasing to $1.1059, a 2% m-o-m increase and 9% y-o-y increase. m. Similarly, the British pound also increased in value against the US dollar in July 2023, with the average exchange rate rising to $1.2889, reflecting a 2% increase m-o-m and 7% increase y-o-y (Figure 9). Inflation in the Euro area continued to decline in July 2023 reaching an estimated 5.3% compared to 5.5% in the previous month.

Figure 9: Exchange rates



Source: GECF Secretariat based on data from Refinitiv Eikon

1.2 Other Developments

G20 Meetings - The 4th Energy Transitions Working Group (ETWG) meeting convened on July 19-20, 2023, in Goa, India. Over 115 representatives from G20 member countries were gathered at the event, including 9 specially invited countries. The central focus of the meeting was on advancing discussions and strategies related to energy transition. Under the stewardship of India's G20 presidency, six priority areas wereoutlined. These encompass energy transition solutions targeted at addressing technology gaps, low-cost financing for energy transition, energy security and diversified supply chains, energy efficiency, industrial low carbon transitions and responsible consumption, fuels for future, universal access to clean energy and just, affordable, and inclusive energy transition pathways. The ETWG will release 13 global studies on these key topics.

Subsequently, the G20 Energy Transitions Ministers' Meeting took place on July 22, 2023. The G20 energy ministers met under the theme 'One Earth, One Family, One Future'. While consensus was reached on the majority of issues discussed, the meeting did not culminate in a comprehensive agreement on all fronts. Consequently, a joint communique was not issued. Nonetheless, the energy ministers did release an Outcome and Chair's Summary document, agreeing on 22 out of 29 paragraphs. There was strong support for the acceleration of

hydrogen development, with five guiding principles highlighted in the 'G20 High Level Voluntary Principles on Hydrogen.'

The ministers also failed to reach consensus on including language related to the phasing down of unabated fossil fuels in paragraph 25 of the document. The following excerpt was taken from the Chair's summary, "*The energy sector's contribution to global GHG emissions is significant. Given that fossil fuels currently continue to play a significant role in the global energy mix, eradication of energy poverty, and in meeting the growing energy demand, the importance of making efforts towards phase down of unabated fossil fuels, in line with different national circumstances, was emphasized by some members while others had different views on the matter that abatement and removal technologies will address such concerns*." Other issues which eluded consensus were the voluntary contributions towards tripling of renewable energy capacities by 2030 and the commitments of developed countries to deliver on the goal of jointly mobilising $100 billion per year from 2020-2025 for climate action in developing economies.

Japan: At the LNG Producer-Consumer Conference 2023 (LNG PCC 2023) held on July 18, 2023, in Tokyo, Japan, the government of Japan announced its intention to establish an LNG reserve system to secure gas resources for unexpected situations. Moreover, Japan made a proposal to the IEA for consideration of expanding its role in natural gas security by setting up a natural gas stockpiling mechanism for member states. The Chair's Summary document entitled 'LNG Strategy for the World' stated the following: *'The increasing attention to the need for ensuring reserves of natural gas/LNG presents an opportunity to further discuss potential roles of IEA in natural gas/LNG security, learning from its experiences in oil stockholding systems and building on its in-depth energy markets knowledge and analysis.'* The proposal will be discussed further at the IEA's next Ministerial Meeting planned to be held in February 2024.

2 Gas Consumption

2.1 Europe

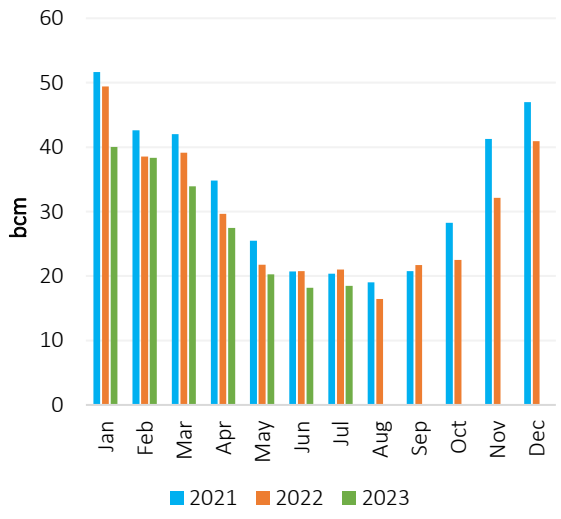
2.1.1 European Union

In July 2023, gas consumption in the European Union (EU) fell by 12% year-on-year (y-o-y), totalling 18 bcm (Figure 10). A significant factor contributing to this decline was the enactment of the EU regulation encouraging a voluntary 15% reduction in gas demand, effective from April 1, 2023, to March 31, 2024. Additionally, the rise in renewable energy production, especially solar, led to a decrease in the reliance on gas within the EU's power generation mix. Despite a decline in gas prices over the course of the month, the industrial sector's demand has yet to return to levels seen in the previous years. This lingering shortfall can be traced back to a noticeable erosion of gas demand observed over the past two years.

Gas-based electricity production within the EU fell by 16% y-o-y, while total electricity production decreased by 5% y-o-y, reaching 196 TWh. The decrease in gas-fired power generation was driven by the rising output from other renewable energy sources. Hydro, solar and wind power generation witnessed substantial growth of 4%, 13% and 22% y-o-y, respectively. Additionally, there was a significant decrease of 43% y-o-y (equivalent to 14 TWh) in electricity generation from coal. Electricity generation from nuclear power rose by 7% y-o-y (Figure 11). Renewables accounted for the largest share of the power mix at 35%, followed by nuclear (24%), gas (19.5%), hydro (11.5%) and coal (10%).

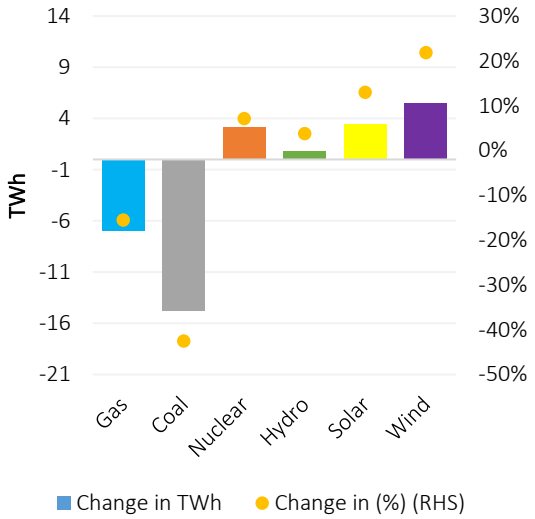
For the period from January to July 2023, EU's gas consumption fell by 11% y-o-y, reaching 197 bcm.

Figure 10: Gas consumption in the EU



Source: GECF Secretariat based on data from Entsog and McKinsey

Figure 11: Trend in electricity production in the EU in July 2023 (y-o-y change)



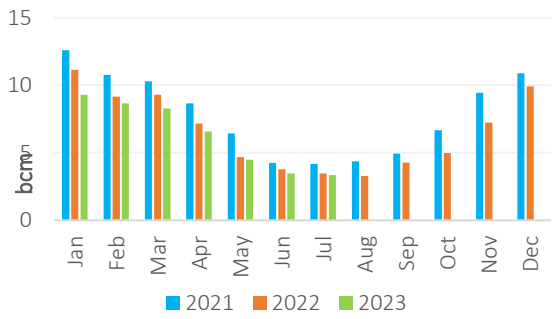
Source: GECF Secretariat based on data from Ember

2.1.1.1 Germany

In July 2023, Germany's gas consumption dropped by 3.5% y-o-y to 3.3 bcm (Figure 12). This was driven primarily by the gas demand reduction measures. In addition, high hydro and wind output in the power generation sector played a part in reducing gas consumption. Renewables, including solar, wind and biomass, represented 61% of the power generation mix in Germany during the month. By the end of the first half of the year, the solar capacity installed in Germany had reached over 71 GW.

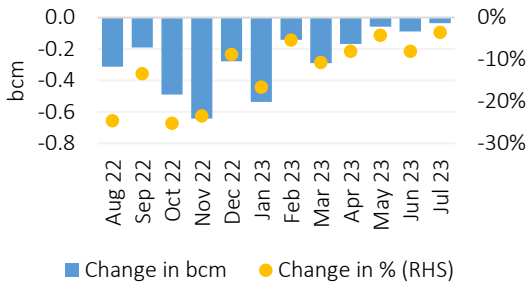
The industrial sector continued its downward trend for fourteen consecutive months, registering a 4% y-o-y decline (Figure 13). Additionally, consumption in the residential/commercial sector decreased by 6% y-o-y.

Figure 12: Gas consumption in Germany



Source: GECF Secretariat based on data from Refinitiv

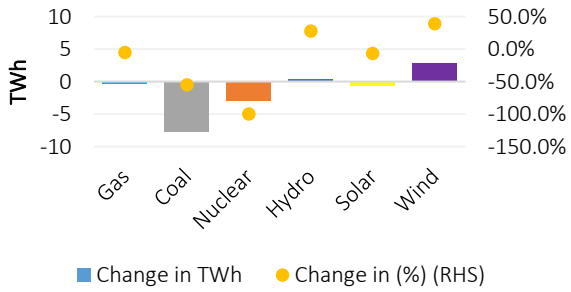
Figure 13: Trend in gas consumption in the industrial sector in Germany (y-o-y change)



Source: GECF Secretariat based on data from Refinitiv

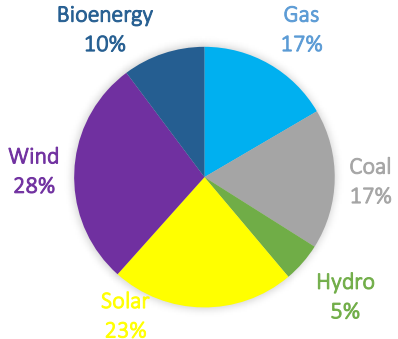
Electricity production from gas witnessed a 5.3% y-o-y decrease, while total electricity production fell by 18% y-o-y, amounting to 36 TWh. the same period witnessed a notable increase in energy generation from hydro (28% y-o-y) and wind (39%), as weather conditions were favourable for renewable energy generation. Consequently, electricity production from coal witnessed a substantial decline of 55% compared to the previous year (Figure 14). Renewables held the dominant position in the energy mix, comprising 61% of the total, followed by coal (17%), gas (17%), and hydro (5%) (Figure 15).

Figure 14: Trend in electricity production in Germany in July 2023 (y-o-y change)



Source: GECF Secretariat based on data from Refinitiv and Ember

Figure 15: German electricity mix in July 2023



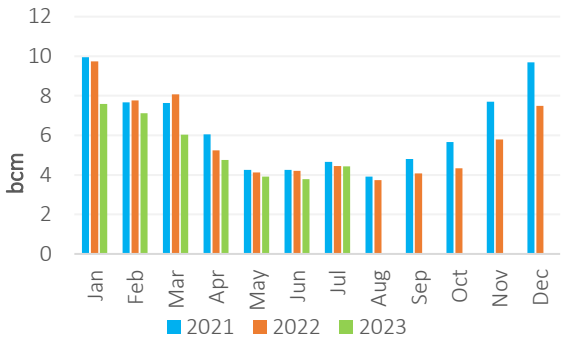
Source: GECF Secretariat based on data from Refinitiv and Ember

For the period from January to July 2023, Germany's gas consumption fell by 9.3% y-o-y, reaching 44 bcm.

2.1.1.2 Italy

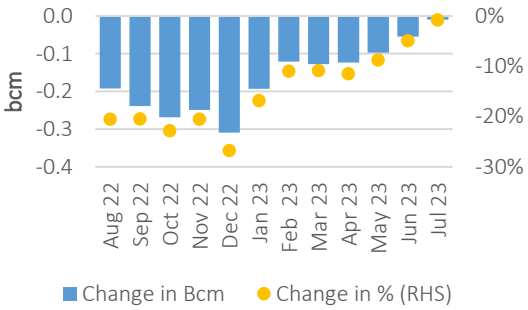
In July 2023, Italy's gas consumption dropped by 0.4% y-o-y to reach 4.4 bcm (Figure 16). The residential, power generation and industrial sectors observed declines of 1.2%, 7.8% and 1%, respectively, reaching 0.9 bcm, 2.2 bcm and 1 bcm, respectively. This decrease in gas consumption was largely due to the high output of hydro and solar energy recorded during the month. For the 19th consecutive month, gas consumption in the industrial sector witnessed a y-o-y decline (Figure 17).

Figure 16: Gas consumption in Italy



Source: GECF Secretariat based on data from Snam

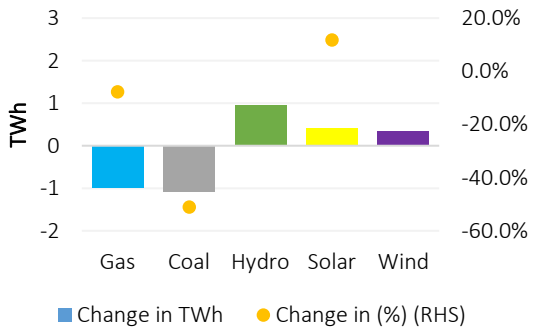
Figure 17: Trend in gas consumption in the industrial sector in Italy (y-o-y change)



Source: GECF Secretariat based on data from Snam

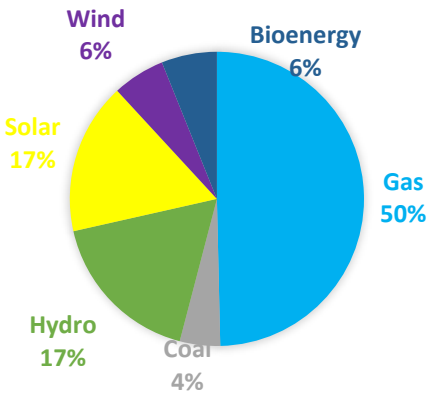
In July 2023, gas-based electricity production witnessed a notable decline of 7.8% y-o-y, resulting in a total decrease in electricity production of 1.7% y-o-y, reaching 23.5 TWh. In contrast, there was a significant y-o-y increase in energy generation from hydro (30%), solar (12%), and wind (32%) (Figure 18). Despite these changes, gas remained the dominant fuel in the power mix, accounting for 50% of the total, followed by renewables (29%), hydro (17%) and coal (4%) (Figure 19). It is worth noting that natural gas consumption did not benefit from the cooling demand recorded during the month following the heat wave that struck Italy during same period.

Figure 18: Trend in electricity production in Italy in July 2023 (y-o-y change)



Source: GECF Secretariat based on data from Refinitiv and Ember

Figure 19: Italian electricity mix in July 2023



Source: GECF Secretariat based on data from Refinitiv and Ember

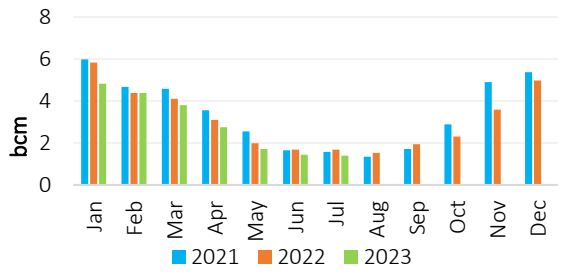
For the period from January to July 2023, Italy's gas consumption fell by 14% y-o-y, reaching 38 bcm.

2.1.1.3 France

In July 2023, France's gas consumption declined by 17% y-o-y to reach 1.4 bcm. This marked the fifth consecutive monthly decrease following a temporary rebound observed in February 2023 (Figure 20). The decline in gas consumption was mainly due to a sharp reduction in usage within the power generation sector, attributed to a recovery in nuclear output compared to the previous year. However, it is worth noting that high temperatures in the Rhone River caused nuclear power production shut down on some days during the month. Temperatures on the river exceeded the limit of 20°C, leading to the nuclear power production restriction level.

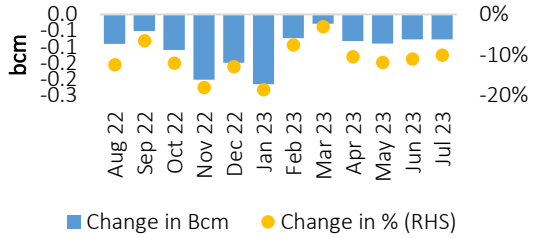
Despite falling gas prices, gas consumption in the industrial sector continued to decline, with a drop of 10% y-o-y (Figure 21). The residential sector also experienced a decline of 5% y-o-y, due to the implementation of the EU regulation promoting a voluntary 15% reduction in gas demand.

Figure 20: Gas consumption in France



Source: GECF Secretariat based on data from GRTgaz

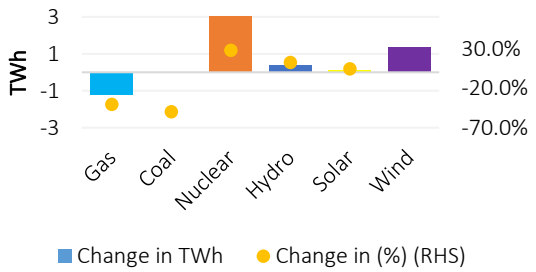
Figure 21: Trend in gas consumption in the industrial sector in France (y-o-y change)



Source: GECF Secretariat based on data from GRTgaz

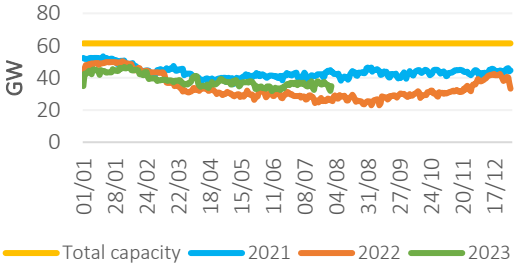
Electricity production from gas witnessed a significant decline of 41% y-o-y, while total electricity production increased by 20% y-o-y, reaching 35 TWh. The month also marked a recovery in electricity generation from nuclear power, increasing by 28% y-o-y. Nuclear capacity availability rose by 32% y-o-y and 7% m-o-m (Figure 23). The French EDF utility program forecasts that the upcoming months are expected to see further increases in France's nuclear availability. Higher electricity production was recorded from hydro (12% y-o-y), wind (71%), and solar (4%). However, electricity production from coal remained unchanged (Figure 22).. Nuclear power continued to hold the dominant position in the energy mix, comprising 68% of the total, followed by renewables (17%), hydro (10%), and gas (5%).

Figure 22: Trend in electricity production in France in July 2023 (y-o-y change)



Source: GECF Secretariat based on data from Ember

Figure 23: French nuclear capacity availability



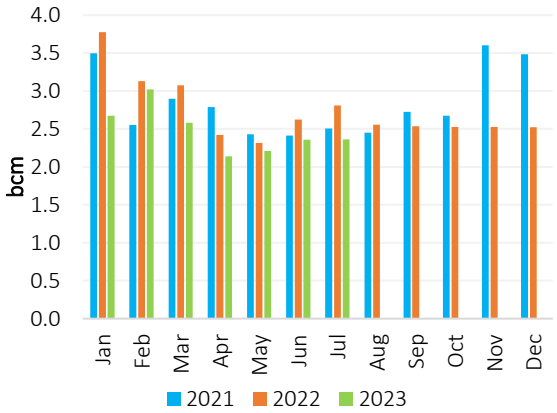
Source: GECF Secretariat based on data from Refinitiv and RTE

For the period from January to July 2023, France's gas consumption fell by 11% y-o-y, reaching 20 bcm.

2.1.1.4 Spain

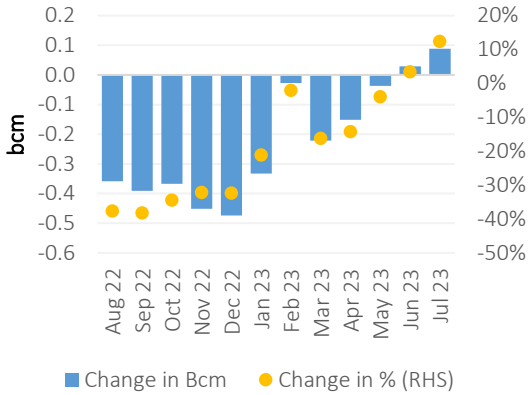
In July 2023, Spain witnessed a 16% y-o-y decline in gas consumption, reaching 2.4 bcm. The power generation sector drove the decline with a drop of 35% y-o-y. The decline was also attributed to increased renewable energy output (solar and hydro) and a reduction in electricity exports to France (Figure 24). In the industrial sector, gas consumption recorded its second consecutive growth in a row, with a y-o-y increase of 12% (Figure 25). This growth was driven by higher gas consumption in the refinery, textile, and pharma industries, with growth rates of 82%, 34%, and 21% y-o-y, respectively.

Figure 24: Gas consumption in Spain



Source: GECF Secretariat based on data from Enagas

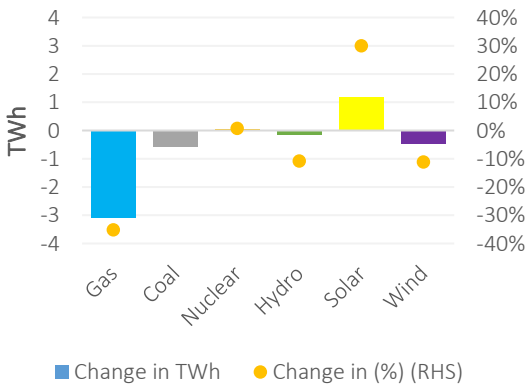
Figure 25: Trend in gas consumption in the industrial sector in Spain (y-o-y change)



Source: GECF Secretariat based on data from Enagas

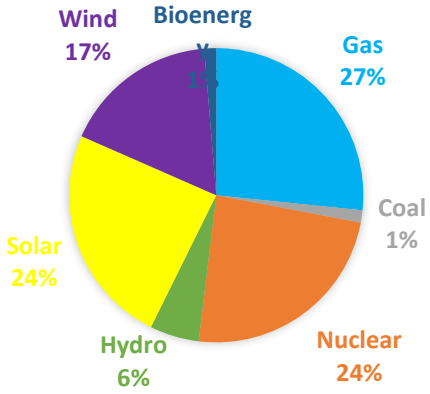
Electricity production from gas declined by 35% y-o-y, while total electricity production decreased by 13% y-o-y to reach 21 TWh. However, there were notable increases in electricity generation from solar (+30% y-o-y). Conversely, electricity production from coal, hydro and wind recorded declines of 66%, 11%, and 11%, respectively (Figure 26). Renewables held the dominant position in the power mix, accounting for 42% of the total, followed by gas (27%), nuclear (24%), hydro (6%), and coal (1%) (Figure 27).

Figure 26: Trend in electricity production in Spain in July 2023 (y-o-y change)



Source: GECF Secretariat based on data from Ember and Ree

Figure 27: Spanish electricity mix in July 2023



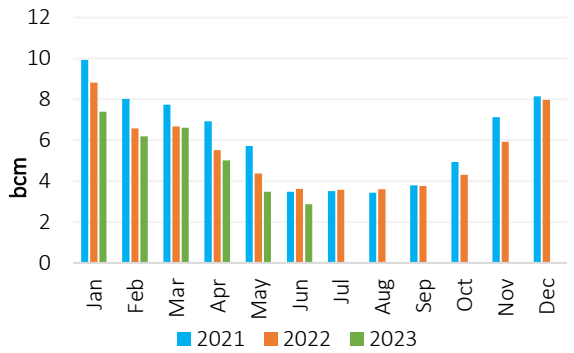
Source: GECF Secretariat based on data from Ember and Ree

For the period from January to July 2023, Spain's gas consumption fell by 14% y-o-y to 17 bcm.

2.1.2 United Kingdom

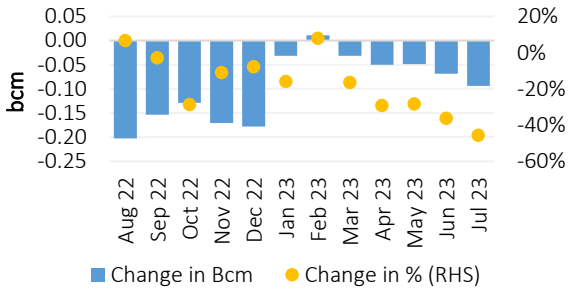
In July 2023, gas consumption in the UK fell by 23% y-o-y, reaching 2.7 bcm (Figure 28). This decline was largely attributed to decreases in gas consumption within the industrial, residential and power generation sectors, which fell by 46%, 7%, and 37% y-o-y, respectively. The reduction in gas consumption in the power generation sector was driven by higher wind output during the month. Additionally, the industrial sector experienced a drop of 0.1 bcm in gas consumption, despite falling natural gas prices. The residential sector recorded a consumption of 1.56 bcm in July 2023 (Figure 29).

Figure 28: Gas consumption in the UK



Source: GECF Secretariat based on data from Refinitiv

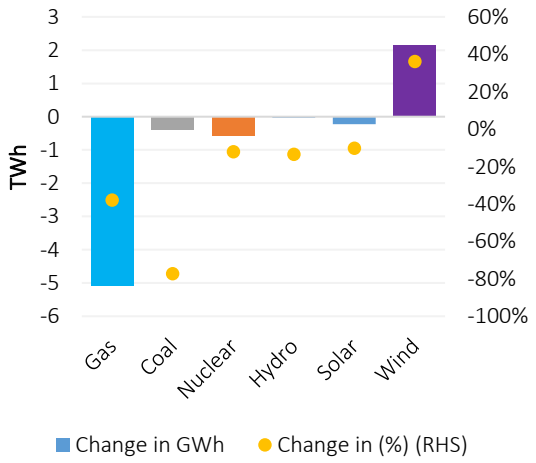
Figure 29: Trend in gas consumption in the industrial sector in the UK (y-o-y change)



Source: GECF Secretariat based on data from Refinitiv

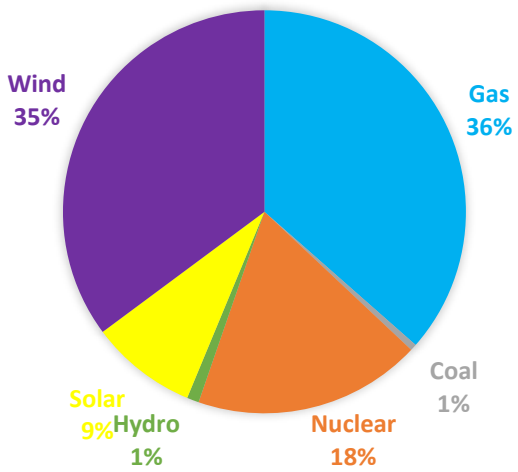
The UK's electricity production from gas decreased by 37% y-o-y, while total electricity production fell by 15% y-o-y, reaching 23 TWh. Wind power generation increased by 36% y-o-y. However, electricity production from nuclear, hydro and solar declined by 12%, 13%, and 10% y-o-y, respectively (Figure 30). Renewables emerged as the dominant energy source in the power mix accounting for 4% of the total, followed by gas (36%), nuclear (18%), and hydro (1%) (Figure 31).

Figure 30: Trend in electricity production in UK in July 2023 (y-o-y change)



Source: GECF Secretariat based on data from Refinitiv

Figure 31: UK electricity mix in July 2023



Source: GECF Secretariat based on data from Refinitiv

For the period from January to July 2023, UK's gas consumption fell by 12% y-o-y to 34 bcm.

2.2 Asia

2.2.1 China

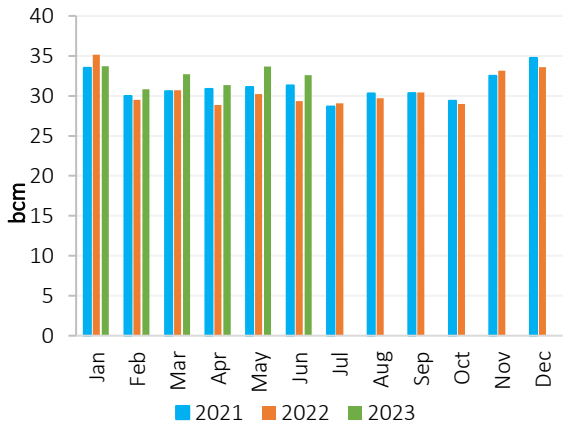
In June 2023, China's apparent gas demand, including pipeline imports, LNG imports and domestic production, surged by 11% year-on-year, reaching 33 bcm. The primary driver behind this increase in natural gas consumption was the rebound in economic activity following the lifting of stringent COVID-19 lockdown measures implemented in 2022.

Additionally, a heatwave in the eastern and southern regions during the month contributed to a surge in cooling demand, resulting in a 5% rise in electricity production compared to the previous year. In June, temperatures in some regions were 4°C higher than the seasonal norms. Furthermore, this increase in electricity demand coincided with low hydro output (34%), which boosted natural gas demand in the power generation sector during the month (Figure 32).

Electricity production from gas increased by 15% year-on-year, while total electricity production rose by 5%, reaching 774 TWh. During the month, there was a surge in electricity generation from coal (+15%), nuclear (+14%), solar (+24%) and wind (+8%) (Figure 33). Coal remained the dominant fuel in the power mix, accounting for 63% of the total, followed by renewables (16%), hydro (13%), nuclear (5%) and gas (3%).

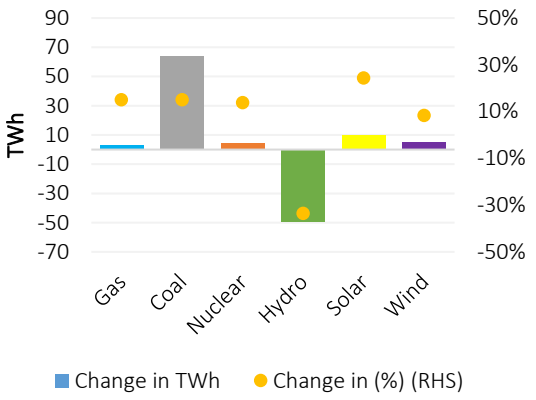
For the first half of 2023, China's gas consumption increased by 6% year-on-year to 195 bcm.

Figure 32: Gas consumption in China



Source: GECF Secretariat based on data from Refinitiv

Figure 33: Trend in electricity production in China in in July 2023 (y-o-y change)



Source: GECF Secretariat based on data from Ember

2.2.2 India

In June 2023, India's gas consumption marked its sixth consecutive month of growth, with a 16% y-o-y increase, reaching 5.4 bcm (Figure 34). The share of regasified LNG in India's gas supply fell to 47%. The fertilizer sector accounted for the largest share of gas consumption at 30%, followed by city gas (19%), power generation (15%), refining (8%) and the petrochemical sector (3%) (Figure 35).

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, boosting cooling demand. This trend in gas consumption is expected to continue in July due to the ongoing heatwave in India.

Figure 34: Gas consumption in India

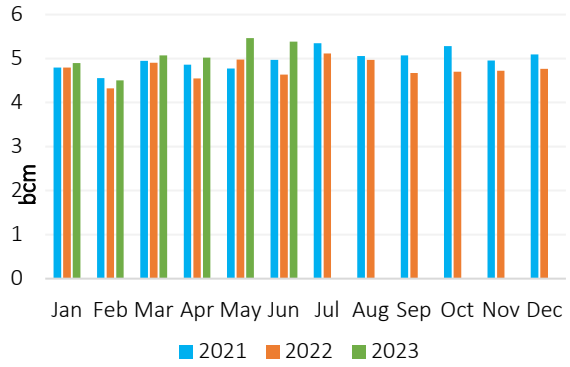
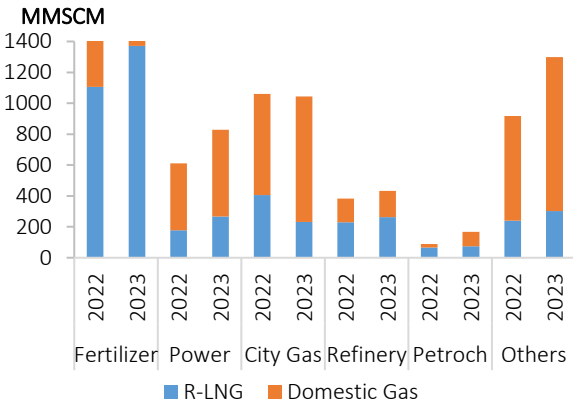


Figure 35: India's gas consumption by sector



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

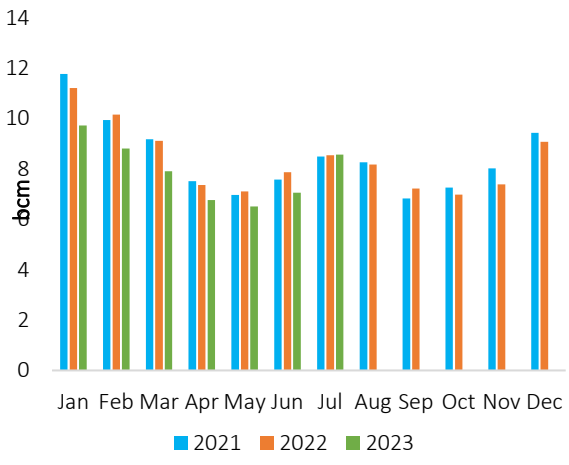
From January to June 2023, India's total gas consumption increased by 7.7% y-o-y to 30 bcm.

2.2.3 Japan

In July 2023, Japan's gas consumption increased by 0.3% y-o-y, totalling 8.6 bcm (Figure 36). This increase can be primarily attributed to higher gas consumption in the power generation sector for cooling because of a heatwave hitting the country. Temperatures in Japan were 2°C above the norm during the month, making July 2023 the hottest on record in the country. Gas consumption in the power generation sector increased by 2.5% y-o-y. However, the city gas sector recorded a decline of 2.8% compared to the previous year. Furthermore, Japan's Heating Degree Days (HDD) averaged 8.1 during the month, indicating a 7% y-o-y growth (Figure 37).

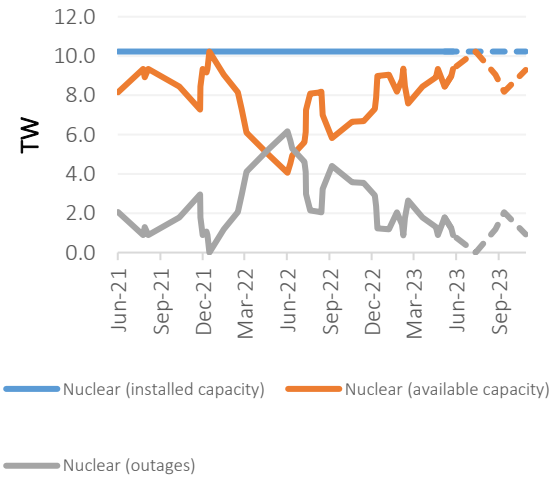
For the period January to July 2023, Japan's gas consumption fell by 10% y-o-y to 55 bcm.

Figure 36: Gas consumption in Japan



Source: GECF Secretariat based on data from Refinitiv

Figure 37: Nuclear availability in Japan



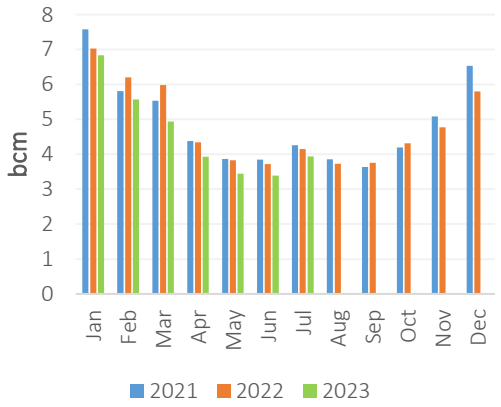
Source: GECF Secretariat based on data from Refinitiv

2.2.4 South Korea

In July 2023, South Korea experienced a 5% y-o-y decrease in gas consumption, totalling 3.9 bcm. This decline was primarily driven by a 19% reduction in gas usage in the residential sector. Additionally, gas consumption in the power generation sector decreased by 7% y-o-y. This decrease was largely due to increased output from coal-based sources, stemming from higher competitiveness of coal compared to natural gas (Figure 38). Moreover, the anticipated increase in solar energy output during the summer months is expected to further reduce the share of natural gas in the power generation mix. South Korea's Heating Degree Days (HDD) averaged 6.2 in July, representing a decline of 8.5% y-o-y (Figure 39).

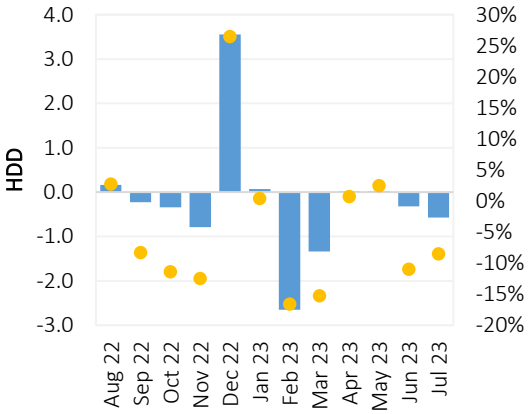
For the period January to July 2023, South Korea's gas consumption fell by 9% y-o-y to 32 bcm.

Figure 38: Gas consumption in South Korea



Source: GECF Secretariat based on data from Refinitiv

Figure 39: HDD in South Korea (y-o-y change)



Source: GECF Secretariat based on data from Refinitiv

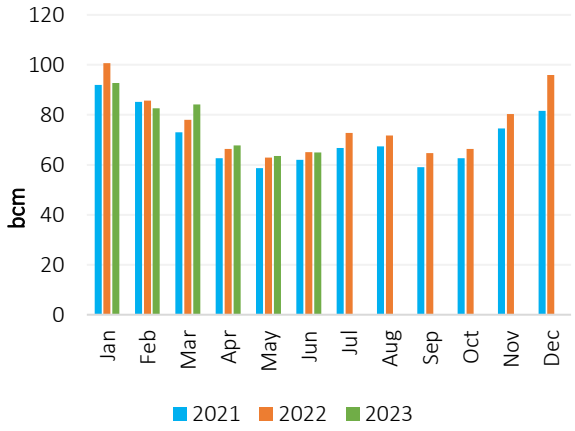
2.3 North America

2.3.1 US

In July 2023, US gas consumption increased by 0.2% year-on-year (y-o-y), reaching 73 bcm (Figure 40). The residential and commercial sectors witnessed an 8% and 5% y-o-y increase, respectively. In the power generation sector, a 5% increase was recorded, reaching 40 bcm. This was due to increased utilization of gas, resulting from higher coal-to-gas switching and lower wind output. Additionally, the industrial sector experienced a y-o-y growth of 1.6% in gas consumption.

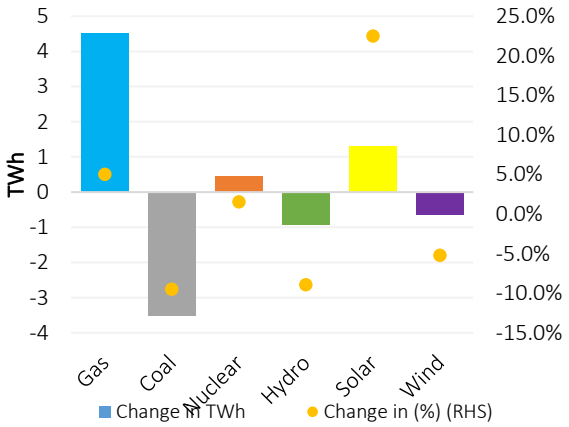
Electricity production from gas rose by 5% y-o-y, while total electricity production increased by 0.7%. The month saw a decrease in electricity generation from coal (-10% y-o-y), hydro (-9%), and wind (-5%), but there was higher production from nuclear (1.5% increase y-o-y) and solar (22% increase y-o-y) (Figure 41). Gas remained the dominant fuel in the power mix with a share of 45%, followed by coal (19%), nuclear (17%), renewable energy sources (11%), and hydro (6%).

Figure 40: Gas consumption in the US



Source: GECF Secretariat based on data from EIA and Refinitiv

Figure 41: Electricity production in the US in July 2023 (y-o-y change)



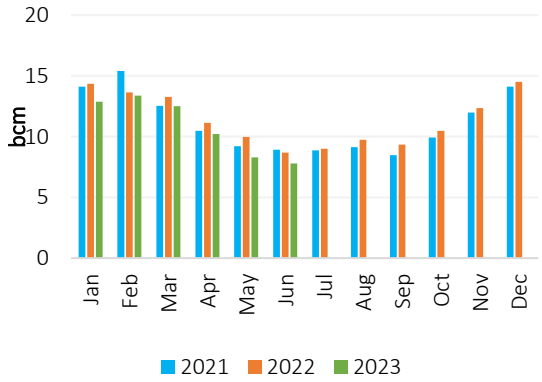
Source: GECF Secretariat based on data from Ember and Refinitiv

For the period January to July 2023, US gas consumption fell by 0.3% y-o-y to 530 bcm.

2.3.2 Canada

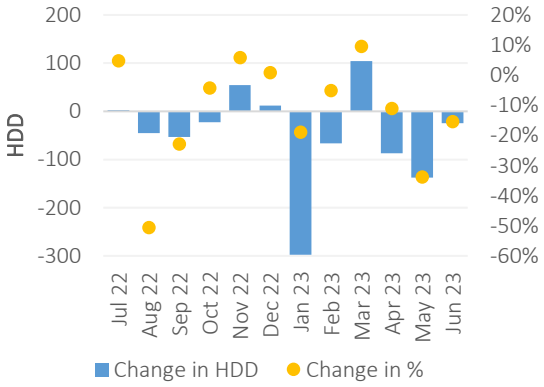
In July 2023, Canada's gas consumption declined by 14% y-o-y, reaching 7.7 bcm (Figure 42). This decline was attributed to reduced gas consumption in the industrial/power generation and commercial sectors, which fell by 15% and 30% y-o-y, respectively. (Figure 43).

Figure 42: Gas consumption in Canada



Source: GECF Secretariat based on data from Refinitiv

Figure 43: HDD in Canada (y-o-y change)



Source: GECF Secretariat based on data from Refinitiv

For the period January to July 2023, Canada's gas consumption fell by 9% y-o-y to 73 bcm.

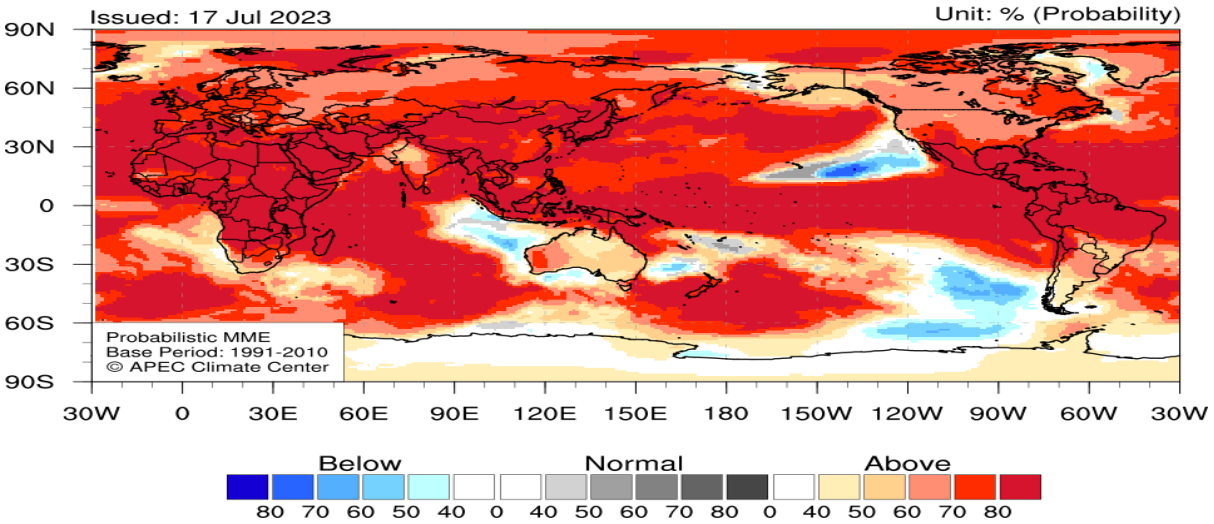
2.4 Weather Forecast

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 August to October 2023

According to the Climate Outlook by the APEC Climate Center published on July 17, 2023 (Figure 44), a pronounced likelihood of experiencing above normal temperatures is predicted for most of the globe (excluding the eastern Indian Ocean, the eastern subtropical North Pacific, south-eastern South Pacific and the Antarctic) for the period August to October 2023.

Figure 44: Temperature forecast August to October 2023

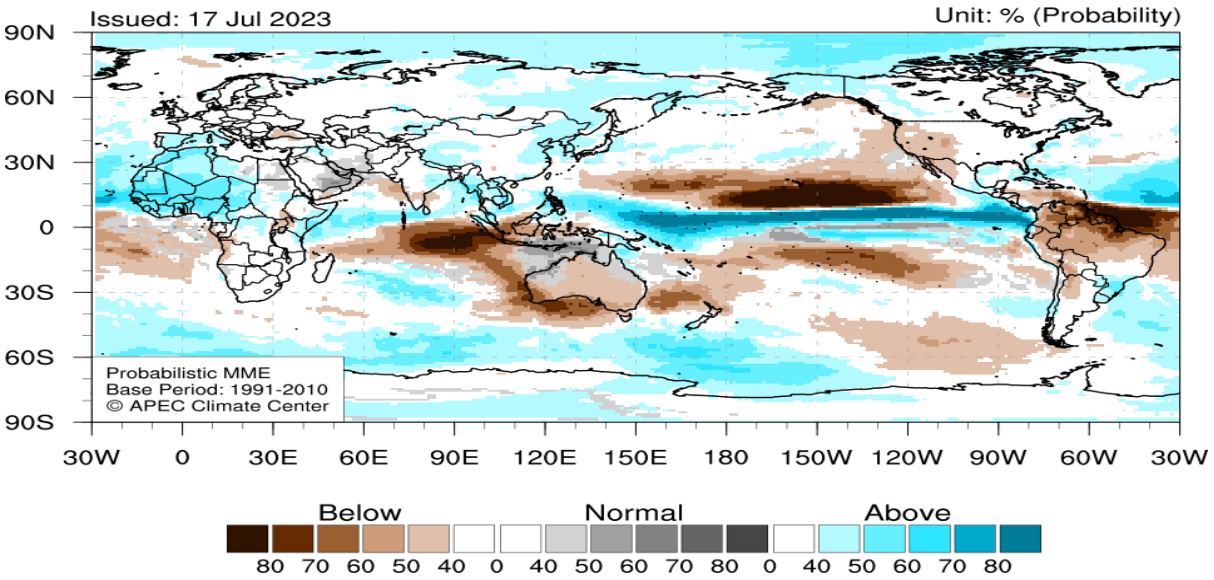


Source: APEC Climate Center

2.4.2 Precipitation Forecast for August to October 2023

According to the Climate Outlook by APEC Climate Center published on July 17, 2023 (Figure 45), 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, Brazil and the Great Australian Bight for the period August to October 2023.

Figure 45: Precipitation forecast August to October 2023



Source: APEC Climate Centre

3 Gas Production

3.1 Global

Revised data shows a minor increase of 0.1% in global gas production for 2022, culminating in a total production volume of 4,037 bcm. This modest rise is primarily attributed to enhanced production in North America and the Middle East. On the other hand, regions such as the CIS and Africa experienced a decline in their gas production volumes (Table 1).

Forecasts for 2023 indicate a resurgence in global gas production, with an anticipated increase of 1.6%. This growth is expected to be led by Africa, LAC, the Middle East and North America, while other regions could either sustain their current production levels or possibly face a decrease. Non-GECF producers are projected to boost their gas production by 3.3%, reaching a total production volume of 2,424 bcm. The United States is anticipated to be the main driver behind this growth, with a rise of 44 bcm in comparison to the previous year.

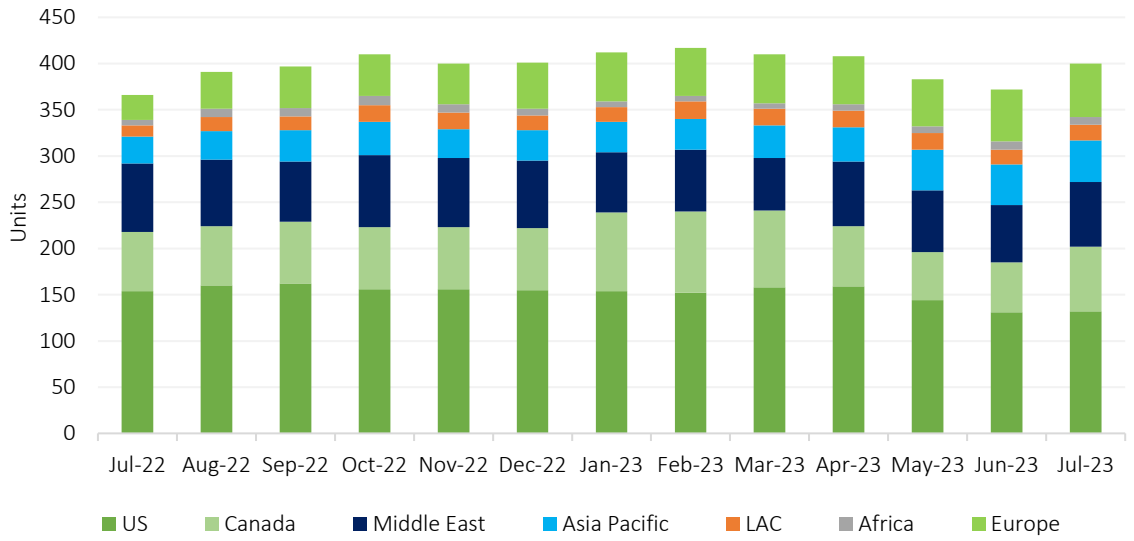
Table 1: Global gas production forecast by region (bcm)

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%
World	4033	4037	-0.12%	4102	0.0%
GECF	1757	1692	0.1%	1678	-0.4%
non-GECF	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 previous estimate*

In July 2023, the global count of gas rigs, a measure of upstream activity, saw a m-o-m increase of 28 units and a y-o-y growth of 34 units, bringing the total to 400 units as shown in (Figure 46). The number of active gas rigs went up in Canada, the Middle East, Europe, the US, Latin America and the Asia Pacific by 16, 8, 2, 1, 1, and 1 unit, respectively. Conversely, Africa recorded a decline of 1 unit.

Figure 46: Trend in monthly global gas rig count



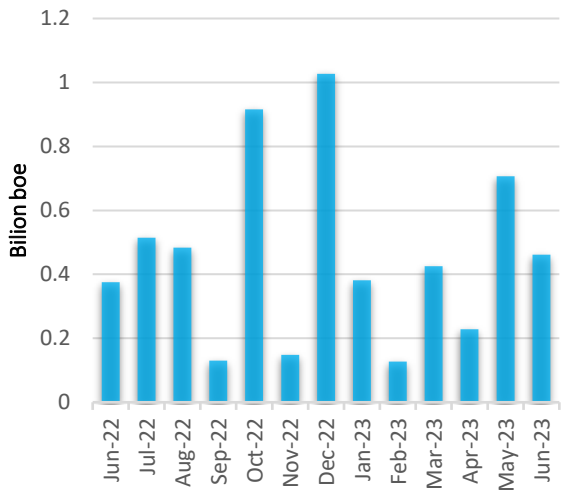
Source: GECF Secretariat based on data from Baker Hughes
Note: Excludes data for Eurasia and Iran

In June 2023, the total volume of gas and liquids discovered amounted to 463 million barrels of oil equivalent (boe). Of this, gas accounted for 13% (11 bcm), while oil constituted the remaining 87% (402 million boe). This marked a decrease in volumes compared to the 707 million boe discovered in May 2023, and an increase compared to the 375 million boe discovered in June 2022. This resulted in an average monthly discovered volume of 435 million boe in the first half of 2023 (Figure 47). The cumulative volume of discoveries in H1 of 2023 reached 2.6 billion boe, compared to discovered volumes of 3 and 4 billion boe for the same period in 2021 and 2022, respectively. The reduced volumes discovered so far in 2023 reflect the challenges facing global exploration activity. The majority of the new discovered volumes in 2023 were liquids, accounting for 78% of the discoveries. Additionally, offshore discoveries represented approximately 66% of the total discoveries, which were dominated mainly by shallow water discoveries.

In June 2023, 3 new discoveries were announced, 2 of which were offshore. Africa, LAC and Europe accounted for 64%, 35% and 1% of the discovered volumes, respectively. No significant discoveries were reported in Asia Pacific, Eurasia, the Middle East and North America. Guyana topped the countries with the highest discovered volumes in H1 of 2023 with approximately 600 million boe, followed by Turkey, Nigeria and Namibia each with approximately 400, 300 and 300 million boe discovered, respectively. (Figure 48).

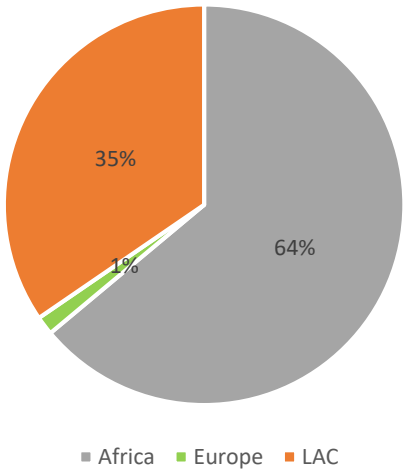
The Ntokon offshore oil and gas discovery in Nigeria was the largest and most significant hydrocarbon discovery announced in June 2023. The Ntokon-1AX exploration well located in the Block OML102 encountered 38m of net oil pay and 15 m of net gas pay, while the side-track Ntokon-1G1 encountered 73 m of net oil pay. Rystad Energy estimated the discovery to hold 300 million boe of recoverable resources. The discovery is located 20 km from the Ofon field, which facilitates developing the block by tie-backing into the existing infrastructure. This gives a good opportunity to maximize the exploration resource at a lower cost.

Figure 47: Monthly gas and liquid discovered volumes



Source: GECF Secretariat based on Rystad Energy Ucube

Figure 48: Discovered volumes in June 2023 by region

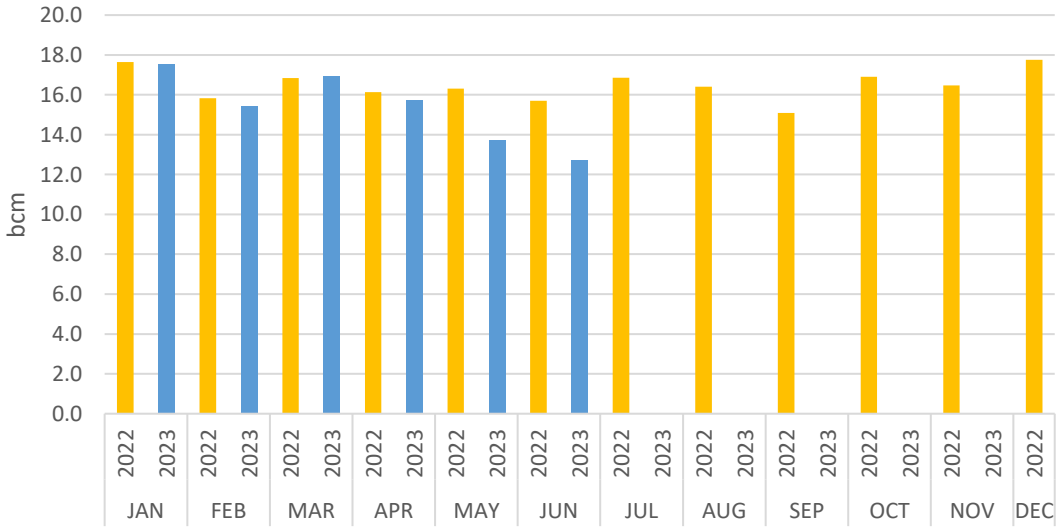


Source: GECF Secretariat based on Rystad Energy Ucube

3.2 Europe

In June 2023, Europe's gas production experienced a y-o-y drop of 18.9%, resulting in a total output of 12.7 bcm (Figure 49). This reduction was mainly attributed to decreased production from the region's two top producers, Norway and the UK. As a result, the overall production for 2023 is forecasted to shrink by 7 bcm in comparison to the previous year.

Figure 49: 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, Romanian gas company Romgaz and OMV Petrom, have approved a final investment decision (FID) to develop the 100 bcm Domino and Pelican South natural gas fields in the Neptun Deep Block, located in the Romanian Black Sea. OMV Petrom will be the operator of the project, with each company holding a 50% working interest. The two companies will invest up to 4 billion euros in the development project. First production is expected in 2027 with a plateau production of 8 bcma for approximately10 years. With the development of the field, Romania is expected to become the largest gas producer in the EU. The project will contribute to Romania's economic growth and strengthen the country's energy security. The development project includes drilling 10 wells, rigging up 3 subsea production systems, an offshore platform and a gas pipeline to Tuzla.

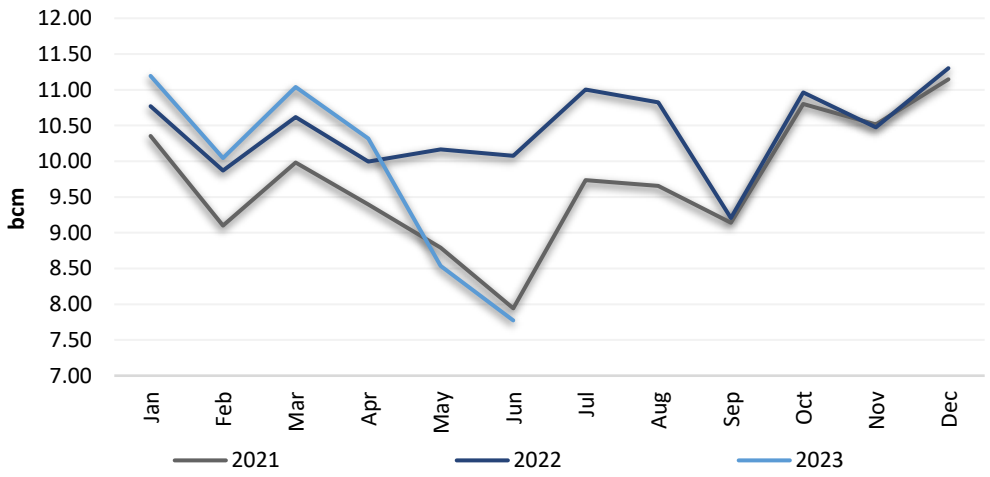
3.2.1 Norway

According to preliminary figures from the Norwegian Petroleum Directorate, Norway's gas production fell by 23% on a y-o-y basis, totalling 7.7 bcm in June 2023 (Figure 50). The cumulative gas production for the first half of 2023 (up to June) totalled 58.9 bcm. The production in May and June was greatly affected by the outage in the Nyhamna processing plant.

As a result of positive news from exploration wells 35/10-10 S and 35/10-10 A, Wellesley Petroleum AS, operator of production licence 1148, updated its preliminary reserves estimates for the gas and condensate discovery to be in the range of (9-46) mcm of recoverable oil equivalent. The wells were drilled 25km northwest of the Troll field and 150km northwest of Bergen. The operator will initiate the early-phase development studies.

Regarding maintenance activities, the Nyhamna gas processing plant was back on stream in mid-July, injecting momentum into Norwegian gas production after approximately two months of maintenance outage. Following the plant's reinstatement, Norwegian gas flows were back above 0.32 bcm/day, signifying the highest level recorded since mid-April. Additionally, the conclusion of temporary outages affecting Troll gas field and Kollsnes gas processing plant was observed in July. These maintenance disruptions exerted upward pressure on wholesale Dutch and British gas during the month. It is worth mentioning that Troll field and the Kollsnes gas processing plant are scheduled to undergo maintenance in August.

Figure 50: Trend in gas production in Norway



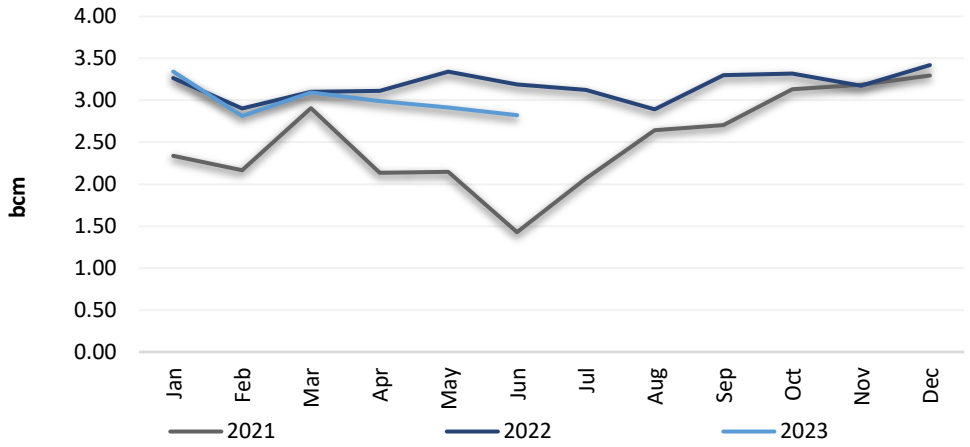
Source: GECF Secretariat based on data from Refinitiv and Norwegian Petroleum Directorate

3.2.2 UK

In June 2023, gas production in the UK fell by 12% (reaching 2.82 bcm) compared to the same month the previous year. The total gas production for the first six months of 2023 amounted to 17.9 bcm, reflecting a y-o-y reduction of 5% (Figure 51).

Deltic Energy PLC increased its estimated oil and natural gas resources for the Pensacola discovery on License P2252 northwest of Breagh gas field in the Zechstein Reef play, Southern North Sea. Based on date collected from exploratory well 41/05a-2, the Pensacola discovery is estimated to hold around 59 bcm of probable gas and oil in place volumes (P50). Deltic Energy is working on several field development scenarios to estimate recoverable reserves, expected to be in the region of 17 bcm. Appraisal well drilling is expected to begin in late 2024.

Figure 51: Trend in gas production in the UK

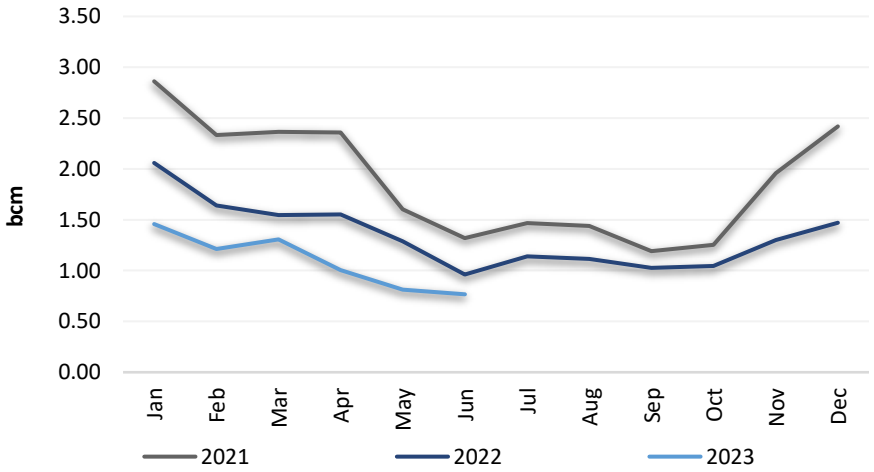


Source: GECF Secretariat based on data from Refinitiv

3.2.3 Netherlands

Total gas production in the Netherlands reached 0.77 bcm in June 2023, marking a 20% decline y-o-y (Figure 52). In May 2023, gas production from the Groningen field was 0.06 bcm, compared to 0.34 bcm in May 2022.

Figure 52: Trend in gas production in the Netherlands



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

3.3 Asia

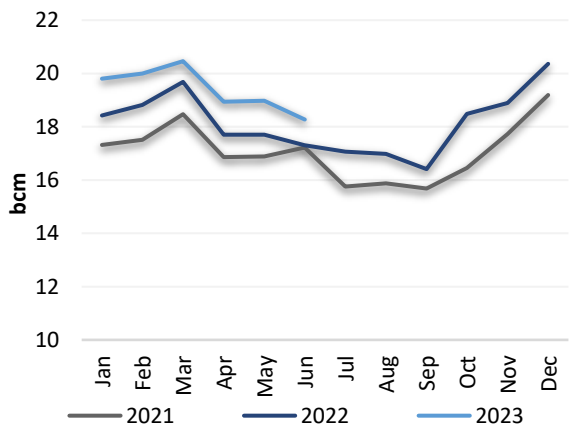
Preliminary figures released by the National Bureau of Statistics indicate that China experienced a 6% y-o-y surge in gas production, reaching 18.27 bcm in June 2023 (Figure 53). Furthermore, cumulative gas production for the the first six months of 2023 exhibited 6% growth, totalling 116.44 bcm. In addition, China achieved a coal-bed methane (CBM) output of 1.08 bcm in June 2023.

Furthermore, Chinese energy company CNPC announced that its gross gas production for H1 2023 has surpassed the halfway point of the annual production targets, reaching 71 bcm. CNPC's four main producing fields (Changqing, Trim, Southwest conventional and Southwest Shale) accounted for about 90% of the production, or 67.2 bcm, representing a 6% rise compared to 2022 level. The Changqing field was the primary production contributor with production volumes reaching 26.5 bcm, representing a 4.7% y-o-y increase.

In June 2023, India's gas production demonstrated a 4% y-o-y increase, culminating in a total output of 2.86 bcm (Figure 54). The cumulative gas production from January to June 2023 totalled 16.75 bcm, indicating a 2% rise compared to the previous year.

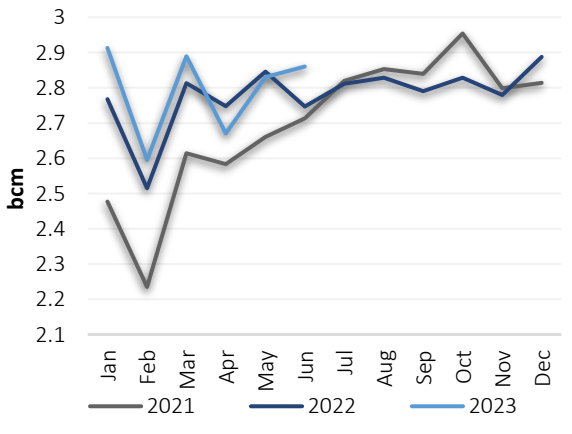
In July 2023, Reliance Industries Limited and its partner BP achieved the commencement of first gas production from the third deep-water development in block KG D6, located off the east coast of India. The block's projected peak production is expected to contribute around one third of the country's domestic gas production, effectively meeting approximately 15% of India's demand. RIL is the operator of the KG D6 block, holding 66.7% working interest, with the remaining stake belonging to BP. The MJ field, discovered in 2013, is located about 30km off the marine terminal at Gadimoga, on the east coast of India, at water depth of 1200m. According to the field development plan, the peak production from this High-Pressure High-Temperature (HPHT) field is expected to reach 4.4 bcma of gas and 9.2 million bbl of condensate, with the aggregated production from the block to reach about 11 bcma. The development project includes drilling 8 wells, while the production and processing activities are to be performed utilising the Floating Production Storage and Offloading (FPSO) vessel named Ruby.

Figure 53: Trend in gas production in China



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

Figure 54: Trend in gas production in India



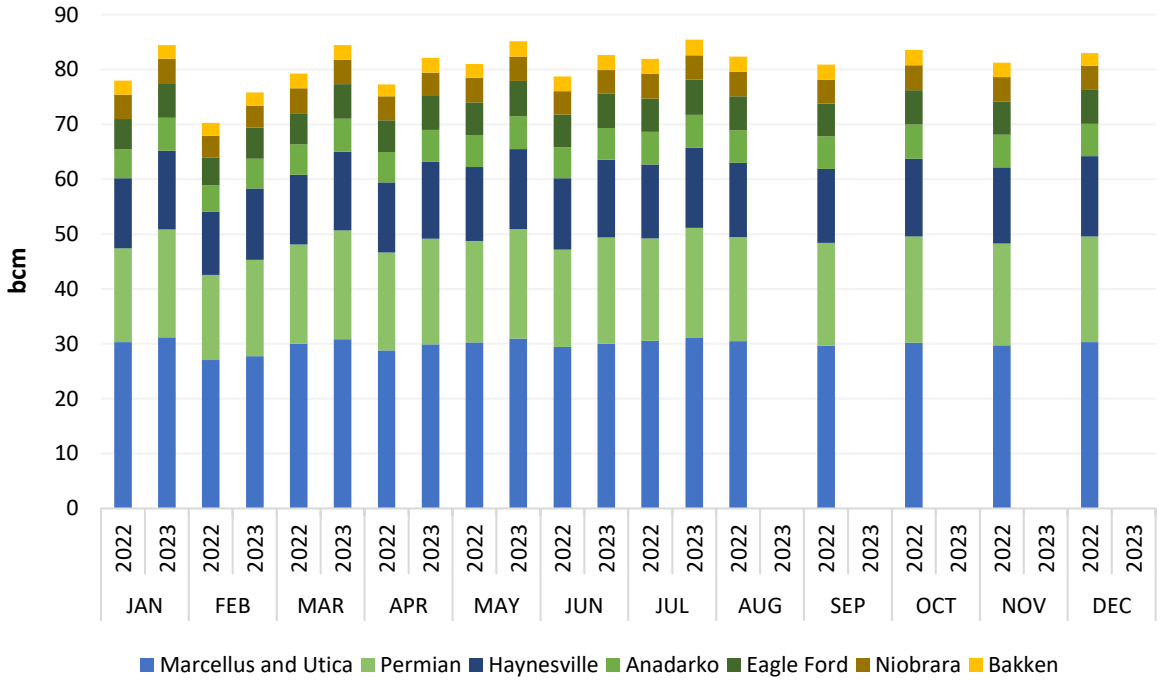
Source: GECF Secretariat based on data from Refinitiv, Ministry of Petroleum (India)

3.4 North America

3.4.1 US

In June 2023, the shale gas output extracted from the seven major regions in the US – namely Anadarko, Appalachian, Bakken, Eagle Ford, Haynesville, Niobrara and Permian – observed a 4% y-o-y expansion, resulting in an aggregate production of 85.45 bcm (Figure 55). Among these regions, the Appalachian, encompassing the Marcellus and Utica shale plays, contributed 36% of the overall production. Furthermore, the Permian shale oil field recorded a rise in associated gas production, achieving 20.08 bcm or 24% of the total shale gas output, signifying a 7% upswing from the previous year.

Figure 55: Trend in shale gas production in the US shale oil/gas producing regions



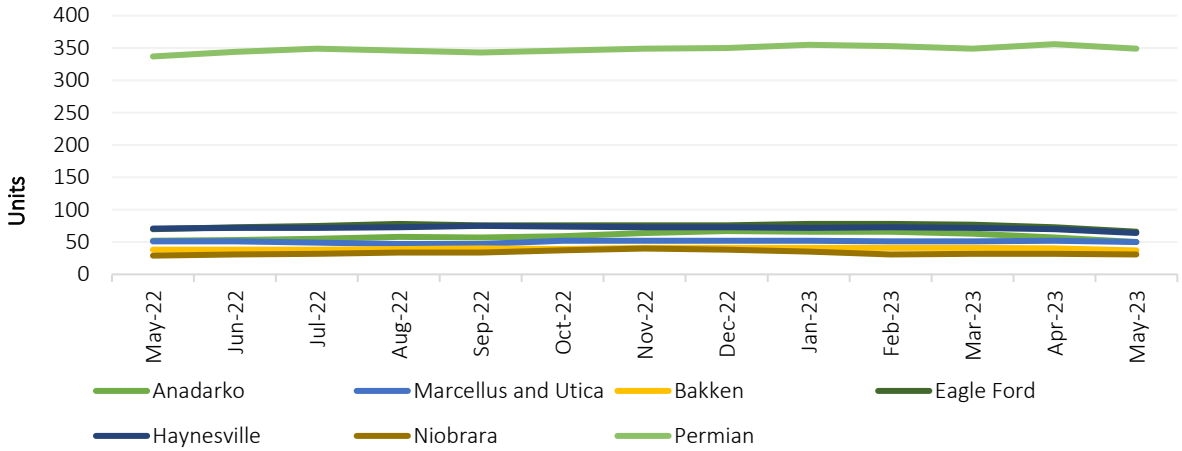
Source: GECF Secretariat based on data from Refinitiv, EIA

As of May 2023, the total number of oil and gas rigs in the seven key shale oil and gas producing regions in the US stood at 647. This represents a reduction of 33 units from April 2023, and a decrease of 1 unit when compared to May 2022 (Figure 56).

Furthermore, these seven key US shale oil and gas regions reported 4,834 drilled but uncompleted (DUC) wells in May 2023. This is a decrease of 30 wells in comparison to the previous month (Figure 57).

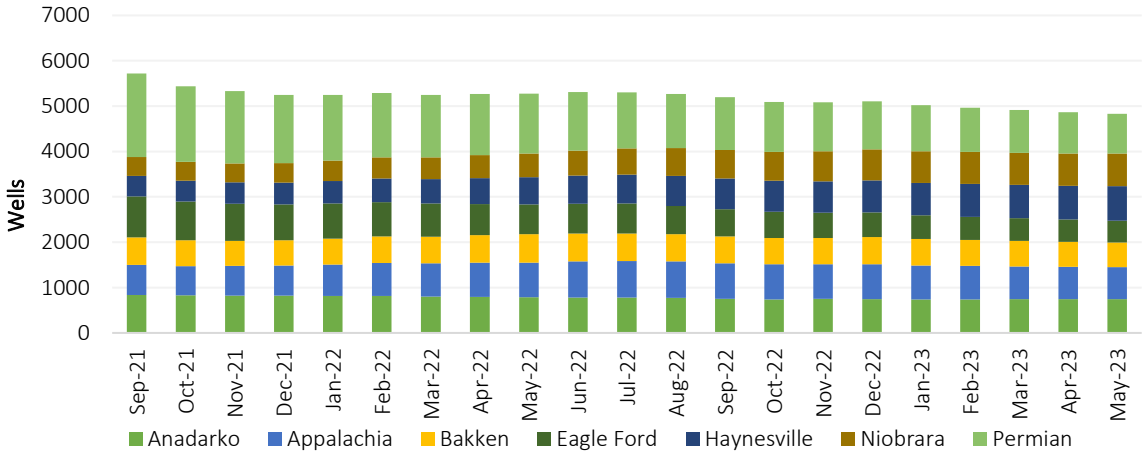
The EIA's Drilling Productivity Report highlights a decrease in the volume of gas produced per rig in the seven key shale oil and gas regions in July 2023, reaching 5,245 thousand cubic feet per newly drilled well. This represents a 0.2% m-o-m and an 11.1% y-o-y decrease (Figure 58).

Figure 56: US shale region oil and gas rig count



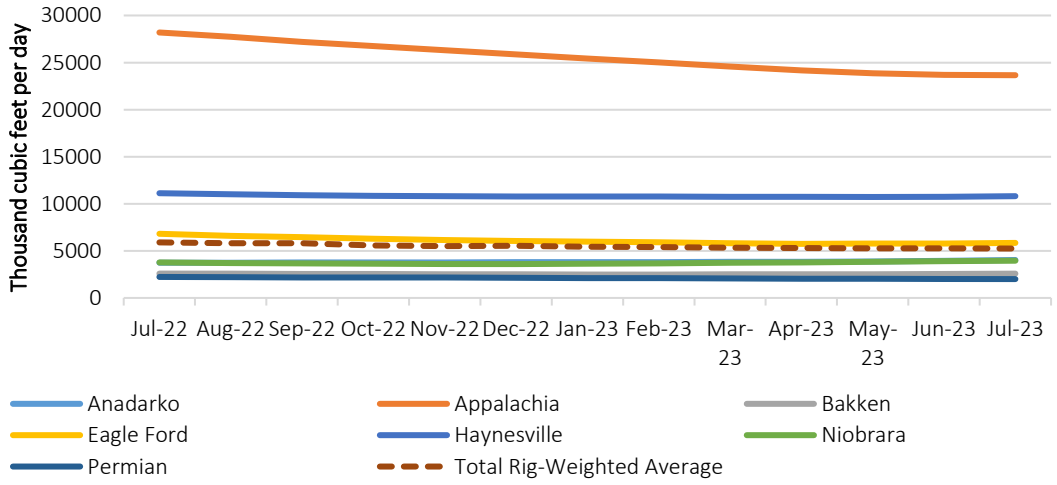
Source: GECF Secretariat based on data from Refinitiv

Figure 57: Drilled but uncompleted well (DUCs) counts in the US



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

Figure 58: New-well gas production per rig

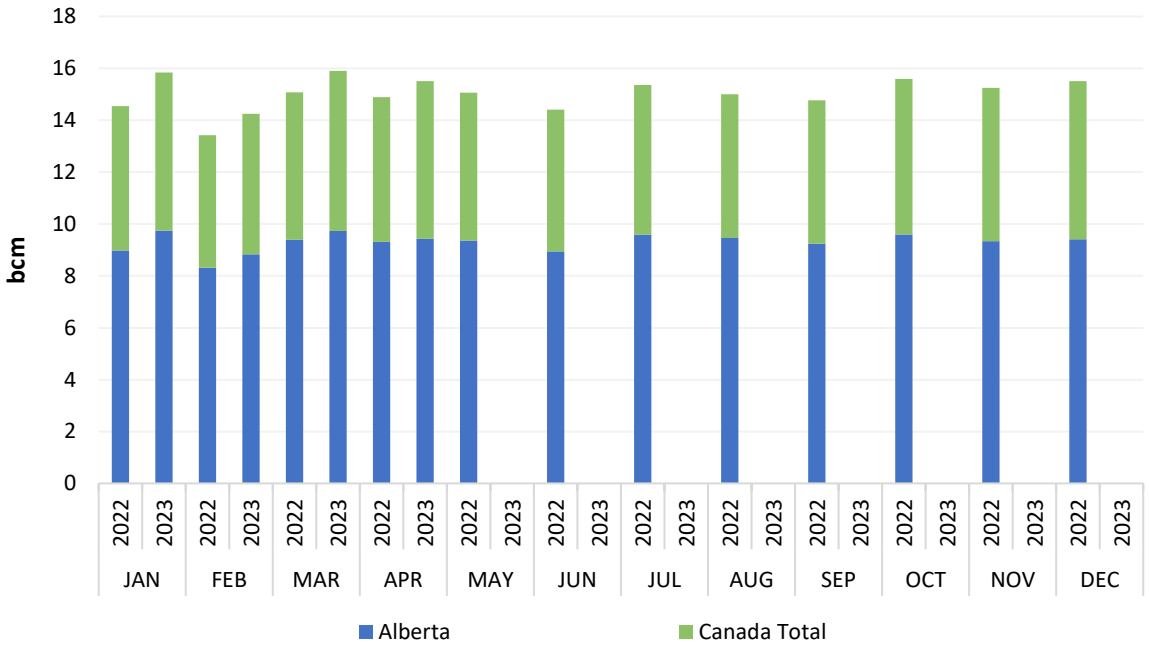


Source: GECF Secretariat based on data from Refinitiv, US EIA

3.4.2 Canada

Data from the Canada Energy Regulator (CER) revealed that Canada's gas production in April 2023 experienced a y-o-y growth of 4%, amounting to 15.5 bcm (Figure 59). The total gas production for the January to April period also saw a 6% y-o-y increase, reaching 61.5 bcm. In contrast, during April 2023, gas production in Alberta experienced a decline of 0.3 bcm, reaching a total of 9.4 bcm.

Figure 59: Trend in gas production in Canada



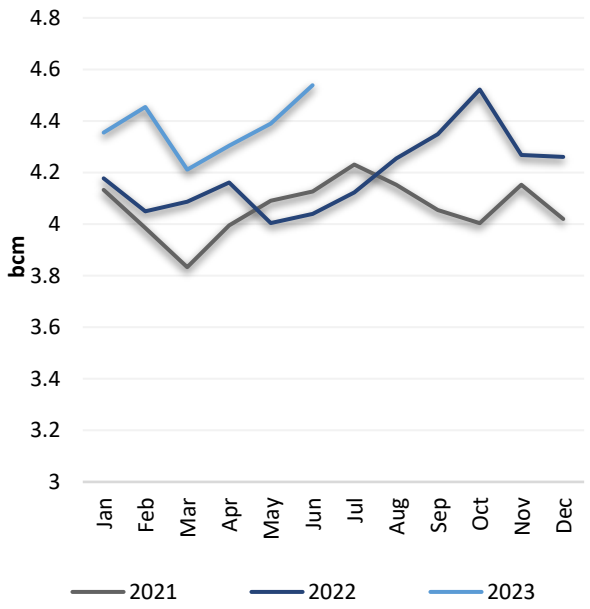
Source: GECF Secretariat based on data from the Canada Energy Regulator (CER)

3.5 Latin America & the Caribbean (LAC)

Data from the Brazilian National Agency for Petroleum (ANP) revealed that Brazil's gross gas production achieved a record monthly high, surging to 4.63 bcm in June 2023. This represents a 5.4% m-o-m increase and a 14.6% y-o-y increase (Figure 60). Notably, the previous record was set in October 2022 at approximately 4.53 bcm. Of the gas produced, approximately 51% of the produced gas was reinjected into reservoirs, mirroring levels from the preceding month. In terms of distribution, offshore gas fields accounted for 83% of the gross monthly gas production, with the Tupi field in the Santos pre-salt basin emerging as the largest gas-producing field at 1.15 bcm. The FPSO facility in Guanabara in the shared Mero field was the highest gas producing facility with approximately 0.35 bcm.

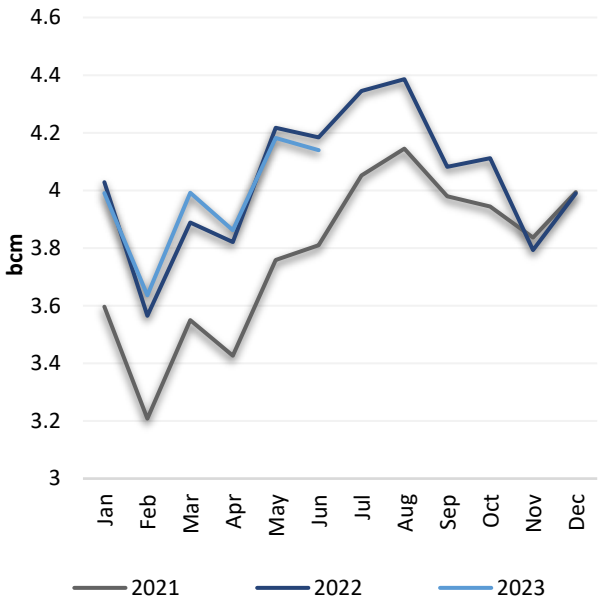
Gross gas production in Argentina reached 4.14 bcm in June 2023, based on data provided by the Argentinian Ministry of Economy. This represents a 1% decrease when compared to the production level recorded in June 2022 (4.18 bcm), as well as a 0.9% decrease in comparison to in May 2023 (4.18 bcm) (Figure 61). The cumulative gas production from January to June 2023 amounted to 23.8 bcm, aligning closely with the production levels for 2022. Shale gas production was 1.86 bcm in June 2023, representing 45% of the gross production while tight gas reservoir production was 0.6 bcm, accounting for 14% of the total gas production. The remaining portion of production stemmed from conventional fields.

Figure 60: Trend in gas production in Brazil



Source: GECF Secretariat based on data from the Brazilian National Agency of petroleum (ANP)

Figure 61: Trend in gas production in Argentina



Source: GECF Secretariat based on data from Argentinian Ministry of Economy

3.6 Other Regions

Egypt plans 1.8 billion USD investment in offshore gas exploration: Egypt has unveiled ambitious plans to invest 1.8 billion USD to drill new gas wells as part of offshore exploration in the Mediterranean Sea and the Nile Delta. The offshore exploration programme involves several international companies including Chevron, Eni, ExxonMobil, Shell and BP. According to Reuters, the programme aims to drill 35 exploratory gas wells over a span of two years, culminating in July 2025. For the 2023/2024 fiscal year, the programme includes drilling 21 wells, while another 14 well are planned for the 2024/2025 fiscal year.

Greater Tortue Ahmeyim (GTA) Phase 1 start-up delayed till Q1 of 2024: BP, which owns 56% working stake in GTA, announced that the production start-up from the Greater Tortue Ahmeyim gas project on Senegal-Mauritania border would be slightly delayed because of setbacks in subsea works. Production start-up is now expected to be in Q1 2024. Kosmos Energy, which owns 26% working stake, previously announced that first gas was expected by the end of 2023. GTA, discovered in 2015, is estimated by both BP and Kosmos Energy to hold approximately 425 bcm (15 tcf) of recoverable gas resource potential. In December 2018, BP approved the final investment decision (FID) for Phase 1 of the project, following agreement between the Mauritanian and Senegalese governments and partners BP, Kosmos Energy and National Oil Companies Société des Pétroles du Sénégal (PETROSEN) and Société Mauritanienne Des Hydrocarbures (SMH). The development is based on a floating LNG (FLNG) concept.

ADNOC completes drilling of the world's first CO_2 injection well: Abu Dhabi National Oil Company (ADNOC) has achieved a significant milestone by successfully concluding the drilling of the world's first fully sequestered CO_2 injection well in Carbonate saline aquifer. This accomplishment is a pivotal step in ADNOC's concerted efforts towards low-carbon projects in line with its 15 billion USD decarbonisation plan. According to the company's press release, the well is under preparation to enter the operational phase, which will inject CO_2 captured from the operations of ammonia producer Fertiglobe for storage safely and permanently underground. The project is regarded as one of the many under way that are accelerating the decarbonisation of ADNOC's operations and the supply of low-carbon products to global customers. Once operational, the project will initially sequester a minimum of 18 Mtpa of CO_2.

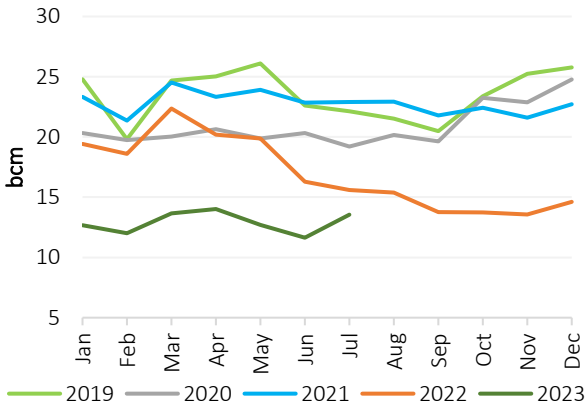
4 Gas Trade

4.1 Pipeline Natural Gas (PNG) Trade

4.1.1 Europe

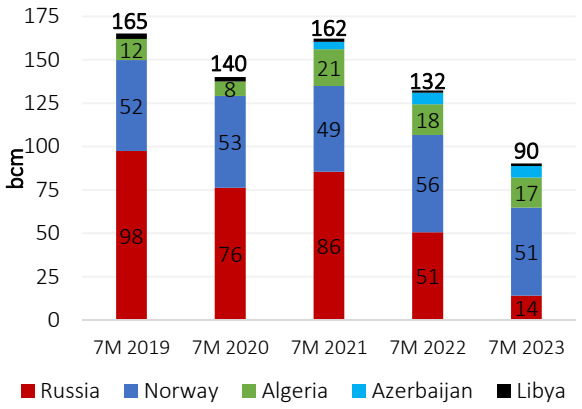
In July 2023, PNG imports to the EU jumped by 16% m-o-m to reach 13.5 bcm (Figure 62). Although this marks a reversal of the declining import of PNG to the EU in recent months, these volumes were still 13% lower than in July 2022. By July 2023, the cumulative pipeline gas supply to the EU reached 90.3 bcm, 32% lower compared to the same period last year (Figure 63). The growth in imports was driven by increases in supply from Norway, Russia and Algeria during the month (Figure 64). Supply from Russia reached the highest level since August 2022.

Figure 62: Monthly PNG imports to the EU



Source: GECF Secretariat based on data from McKinsey and Refinitiv

Figure 63: Year-to-date EU PNG imports by supplier

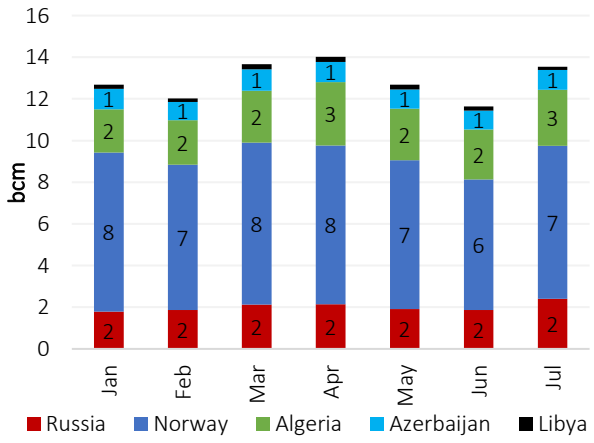


Source: GECF Secretariat based on data from McKinsey and Refinitiv

Over the first seven months of the year, Norway accounted for 56% of the total EU supply, followed by Algeria at 19% and Russia at 16%. However, because of maintenance activity in the upstream, Norway's supply over this period declined by 10% y-o-y, totalling 50.7 bcm. Similarly, Russia's supply decreased by 72% y-o-y to reach 14.1 bcm.

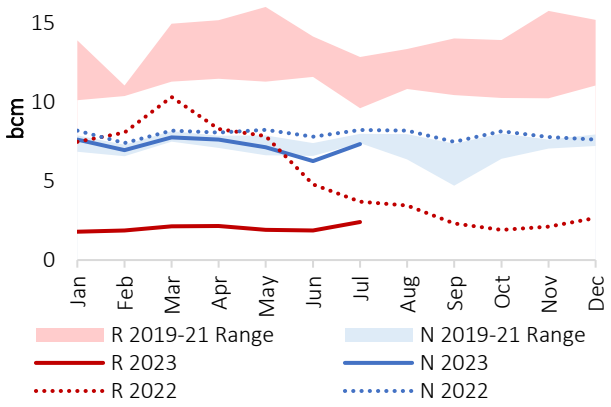
From January to July 2023, Norway's average monthly PNG exports to the EU were 7.2 bcm, compared with 8.0 bcm in 2022 and 7.4 bcm during the same period in the years 2019 to 2021. Russia's average monthly PNG exports to the EU for the same period were 2.0 bcm, compared to 7.2 bcm in 2022 and an average of 12.3 bcm from 2019 to 2021 (Figure 65).

Figure 64: Monthly EU PNG imports by supplier



Source: GECF Secretariat based on data from McKinsey and Refinitiv

Figure 65: EU PNG supply from Russia and Norway

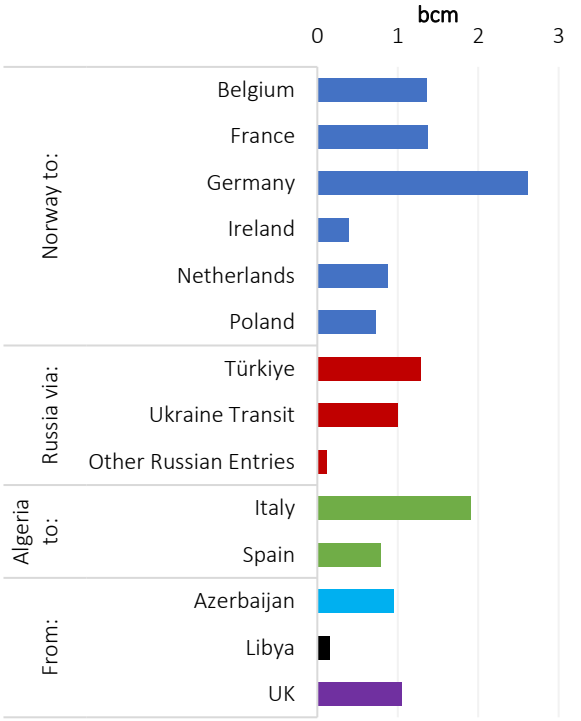


Source: GECF Secretariat based on data from McKinsey and Refinitiv

Figure 66 illustrates the PNG imports to the region through the major supply routes in July 2023. Flows via all of Norway's six entry points increased m-o-m. Exports to France surged by 72%, accounting for 19% of Norway's total exports. Algeria exported 71% to Italy and supplied 0.3 bcm more m-o-m to Spain. Russian flows through Turkstream rose by 82% m-o-m, accounting for 54% of its exports. After declining last month, net PNG flows from the UK rose by 57% in July.

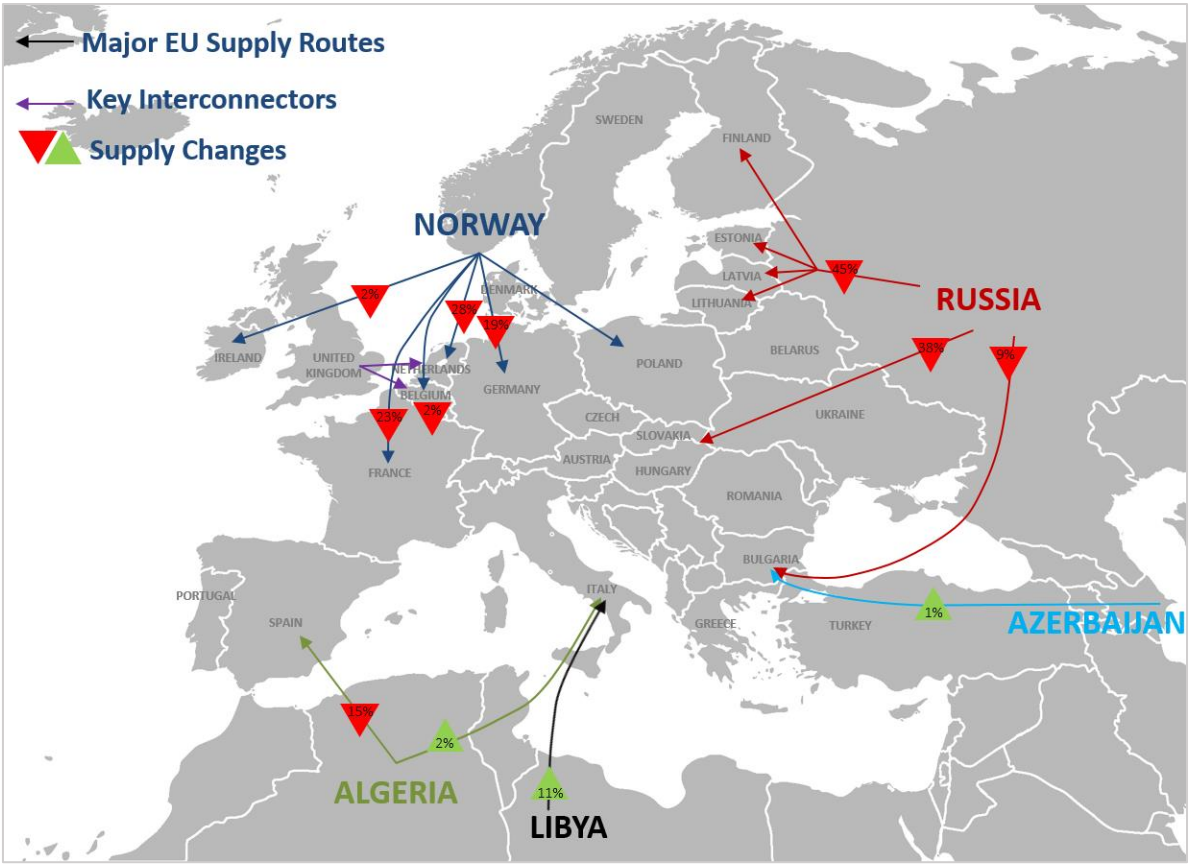
In Figure 67, the EU's PNG imports via major supply routes for the first seven months of 2023 are compared to the same period in 2022. Imports from Azerbaijan and Libya rose by 1% and 11%, respectively. Algeria continues to refocus exports to Italy, increasing deliveries by 2%. Supply from Norway decreased along all import routes, due to increased maintenance activity in recent months.

Figure 66: EU PNG imports by supply route, in July 2023



Source: GECF Secretariat based on data from McKinsey and Refinitiv

Figure 67: PNG imports to the EU by supply route (7M 2023 v 7M 2022)

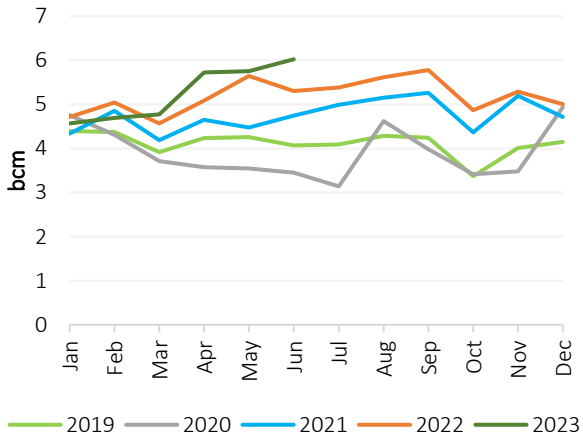


Source: GECF Secretariat based on data from McKinsey and Refinitiv

4.1.2 Asia

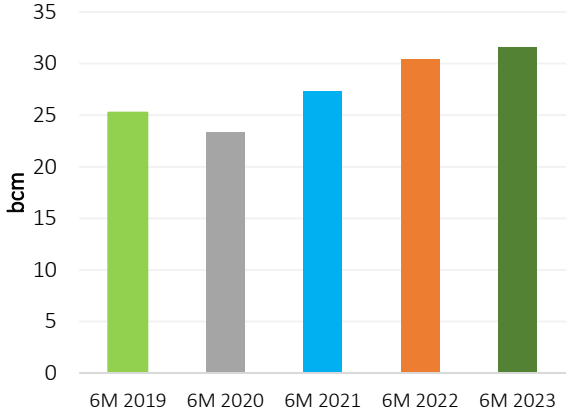
In June 2023, China imported 6.0 bcm of PNG. This quantity represented a 5% increase from the previous month and 14% higher than in June 2022 (Figure 68). China's gas imports have been soaring in recent months, driven by PNG, which accounted for 43% of total gas imports in June. The June PNG import quantity is the highest level on record. During the first half of the year, 31.5 bcm of PNG was imported at an average monthly rate of 5.3 bcm, compared to 5.1 bcm during the same period in 2022 (Figure 69).

Figure 68: Monthly PNG imports in China



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

Figure 69: Year-to-date PNG imports in China

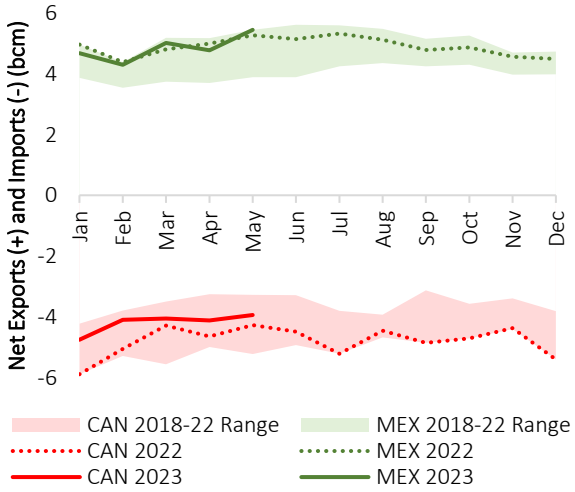


Source: GECF Secretariat based on data from Refinitiv and General Administration of Customs China

4.1.3 North America

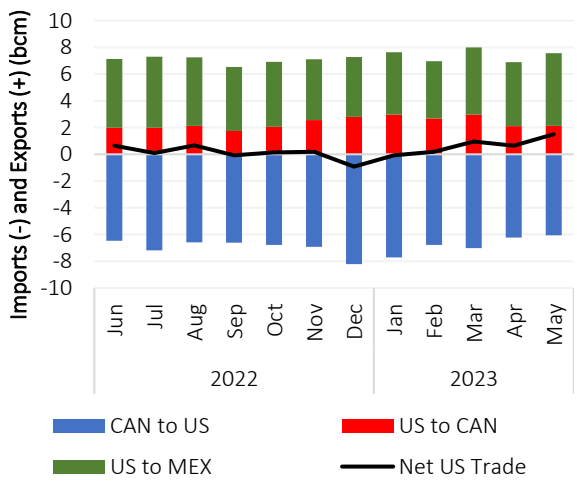
Net PNG exports from the US to Mexico surged by 14% m-o-m in May 2023 to reach 5.4 bcm, the highest level since August 2021 (Figure 70). Consequently, the US recorded a net 1.5 bcm of PNG exports during the month (Figure 71). Net PNG imports from Canada to the US fell by 4% m-o-m to reach 3.9 bcm. Over the first five months of the year, net trade from Canada declined by 13%, while flows to Mexico fell by 1%. The average monthly flows in the region in 2023 were 6.8 bcm from Canada to the US, 2.6 bcm from the US to Canada and 4.8 bcm from the US to Mexico.

Figure 70: Historical net PNG trade in the USA



Source: GECF Secretariat based on data from US EIA

Figure 71: Monthly US PNG trade



Source: GECF Secretariat based on data from US EIA

4.1.4 Other Developments

Milestone development in the Mountain Valley Pipeline project: The much-maligned Mountain Valley Pipeline (MVP) received an important boost on July 27, 2023, when the United States Supreme Court lifted stays earlier imposed by the Court of Appeals, which had been blocking construction on the project. The 21 bcma MVP project is heralded as a major new artery which will transport natural gas supplies from the Appalachian Basin in West Virginia to markets in eastern parts of the US. Over the years, the project has faced numerous delays, mainly centred around the environmental impact of construction. Many of the sticking points involve the pipeline's intended crossing over wetlands and waterways in national parks in the region. With works restarted, the project company expects that construction will be completed before the onset of winter 2023/24.

Argentina pushes forward with PNG developments: Argentina's state-owned firm Enarsa has officially inaugurated the Nestor Kirchner Gas Pipeline on 9 July 2023, the country's national day. The next phase will involve a call for a tender for the pipeline and other related infrastructure, which will expand the existing network and allow for flow reversal on some sections. Project costs are estimated to be in the region of $750 million. The State has already secured $540 million in credit from the Development Bank of Latin America and the Caribbean. When completed, Argentina will have the capability to export pipeline gas to Brazil, Bolivia and Chile, while the government has estimated savings of around $3.5 billion annually in its gas import bill from Bolivia.

Potential for PNG trade between Suriname and Trinidad and Tobago: In July 2023, the governments of Suriname and Trinidad and Tobago met to discuss energy cooperation. The parties signed a memorandum of understanding, which, according to sources familiar with the matter, includes a feasibility study on a potential pipeline project, linking the Surinamese offshore gas fields to the island of Trinidad. Suriname is a nascent player in the gas industry, having recently discovered oil and gas resources, whereas nearby Trinidad and Tobago has decades of experience in petrochemical manufacture as well as LNG exports.

4.2 LNG Trade

4.2.1 LNG Imports

In July 2023, the pace of growth in global LNG imports slowed significantly to 0.3% (0.11 Mt) y-o-y, reaching 32.66 Mt (Figure 72). A sharp decline in European LNG imports led to weaker growth in global LNG imports, which was offset by stronger LNG imports in all other regions, and in particular the MENA region (Figure 73). Between January and July 2023, the cumulative global LNG imports increased by 3.4% (7.92 Mt) y-o-y to reach 239.16 Mt, driven mainly by higher LNG imports in Asia Pacific and Europe, with lesser growth in Latin America and the Caribbean (LAC) and North America.

Figure 72: Trend in global monthly LNG imports

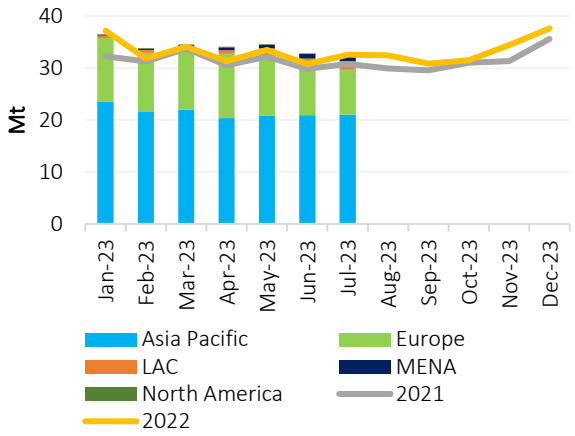
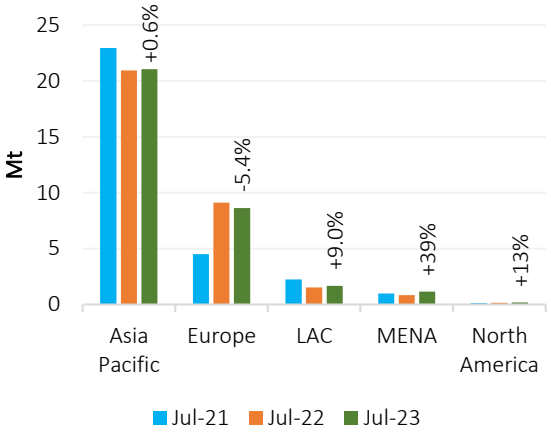


Figure 73: Trend in regional LNG imports in June



Source: GECF Secretariat based on data from ICIS LNG Edge

4.2.1.1 Europe

In July 2023, Europe witnessed its first y-o-y decline in LNG imports since September 2021, recording a 5.4% (0.49 Mt) y-o-y decline, reaching 8.62 Mt (Figure 74). The drop in LNG imports was attributed to weaker gas demand, high gas storage levels and a widening spot LNG price spread between Asia Pacific and Europe. Belgium, France, Spain and the UK accounted for the bulk incremental decline in European LNG imports, which were partially offset by higher imports in Finland, Germany and the Netherlands (Figure 75). From January to July 2023, European cumulative LNG imports rose by 6.4% (4.60 Mt) y-o-y to 76.38 Mt.

In Belgium and Spain, weaker gas consumption coupled with higher gas in storage compared to a year earlier curbed LNG imports in both countries. The level of gas in storage in Belgium and Spain was 84% and 98%, respectively, on 1 July 2023, up significantly from 60% and 72% recorded a year earlier. A decrease in pipeline gas exports from Belgium to Germany also contributed to the decline in LNG imports. Meanwhile, the drop in French LNG imports was mainly due to a slump in gas consumption, particularly in the electricity sector, and maintenance activity at the Fos Tonkin and Montoir LNG import terminals in July 2023. Furthermore, weaker gas consumption and lower pipeline gas exports to mainland Europe resulted in a slowdown in the UK's LNG imports.

Conversely, the stronger LNG imports in Finland and Germany were attributed to the ramp-up in LNG imports at new LNG facilities in both countries, amidst the lower pipeline gas imports from Russia. In the Netherlands, weaker domestic gas production coupled with stronger pipeline gas exports to Germany drove the increase in LNG imports.

Figure 74: Trend in Europe's monthly LNG imports

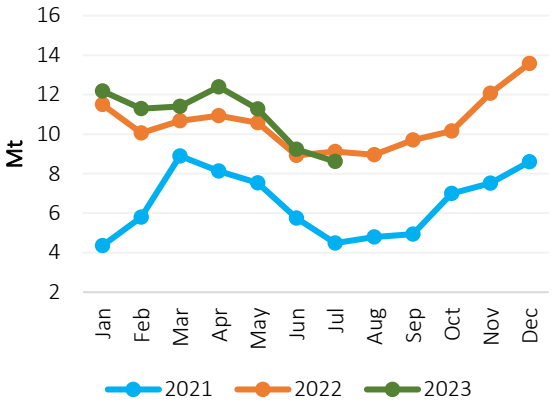
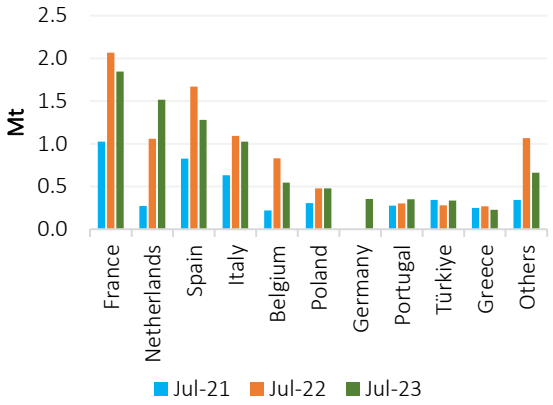


Figure 75: Top LNG importers in Europe



Source: GECF Secretariat based on data from ICIS LNG Edge

4.2.1.2 Asia

In July 2023, LNG imports in the Asia Pacific region continued to increase for the fourth consecutive month, albeit at a slower pace compared to June 2023, growing modestly by 0.6% (0.12 Mt) y-o-y to 21.06 Mt (Figure 76). Despite the increase, Asia Pacific's LNG imports were lower than imports in July 2021. China, Singapore and Thailand drove the growth, which offset a slump in imports in Japan and South Korea (Figure 77). Vietnam also joined the ranks of LNG importers in July 2023. From January to July 2023, the Asia Pacific cumulative LNG imports increased by 2.0% (2.95 Mt) y-o-y, reaching 150.40 Mt.

China's LNG imports jumped in July 2023, rebounding to the July 2021 level. This was supported by the recovery in gas consumption following the end of the Zero-COVID policy, lower spot LNG prices and warmer-than-usual summer weather, which may have boosted gas-burn. The stronger LNG imports from China came mainly from Australia, Russia and the US. In Singapore, portfolio players may have boosted LNG imports for storage and eventual reloads to other Asia Pacific countries. Meanwhile, the surge in Thailand's LNG imports was driven by lower domestic gas production and higher gas consumption in the electricity sector. Conversely, the slump in Japan's LNG imports was mainly due to higher nuclear availability, which curbed gas consumption in the electricity sector. Furthermore, cooler temperatures in South Korea, compared to July 2022, reduced gas burn and hence LNG imports.

Figure 76: Trend in Asia's monthly LNG imports

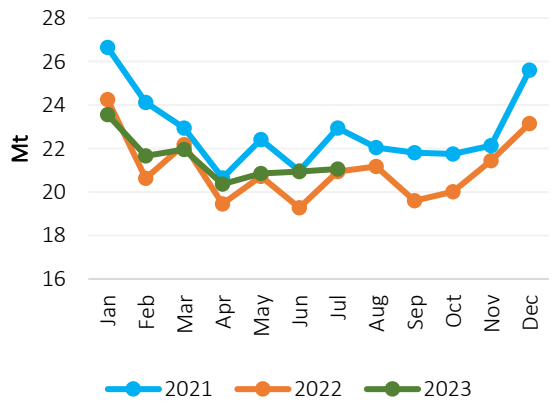
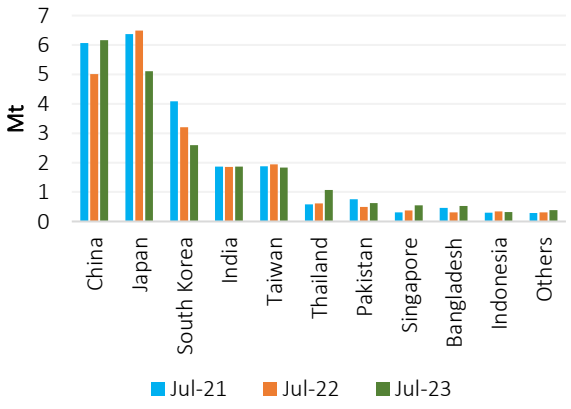


Figure 77: Top LNG importers in Asia



Source: GECF Secretariat based on data from ICIS LNG Edge

4.2.1.3 Latin America & the Caribbean (LAC)

In July 2023, LNG imports in the LAC region stood at 1.67 Mt, and represents an increase of 9.0% (0.14 Mt) y-o-y (Figure 78). Brazil, Jamaica and El Salvador drove the increase in LNG imports, offsetting the decline in imports in Argentina, (Figure 79). Between January and July 2023, cumulative LNG imports in the LAC region grew by 7.1% (0.50 Mt) y-o-y to 7.57 Mt.

Despite higher hydroelectric generation, Brazil increased its LNG imports from Trinidad and Tobago and the US. In Jamaica, the higher LNG imports came solely from Nigeria with some of the incremental LNG volumes destined to Puerto Rico via LNG reloads. Meanwhile, stronger gas consumption in the electricity sector contributed to the uptick in El Salvador's LNG imports. Conversely, the drop in Argentina's LNG imports was attributed to higher domestic gas production and a mild winter season.

Figure 78: Trend in LAC's monthly LNG imports

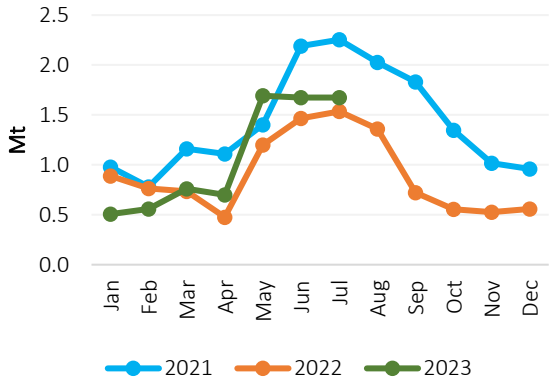
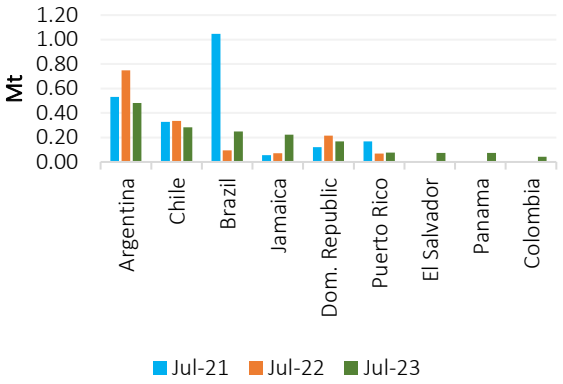


Figure 79: Top LNG importers in LAC



Source: GECF Secretariat based on data from ICIS LNG Edge

4.2.1.4 MENA

In July 2023, the MENA region's LNG imports surged by 39% (0.32 Mt) y-o-y, reaching 1.15 Mt (Figure 80). Egypt, Jordan and Kuwait accounted for the surge in the region's LNG imports (Figure 81). From January to July 2023, the MENA region's LNG imports fell by 6.4% (0.27 Mt) y-o-y to 3.94 Mt. The rise in Kuwait's LNG imports was mainly due higher gas burn amidst extremely high temperatures. Meanwhile, both Egypt and Jordan imported their first LNG cargo in 2023. It should be noted that the LNG cargo imported in Egypt was exported from the Damietta LNG facility in Egypt and delivered to the Ain Sukhna Product Hub.

Figure 80: Trend in MENA's monthly LNG imports

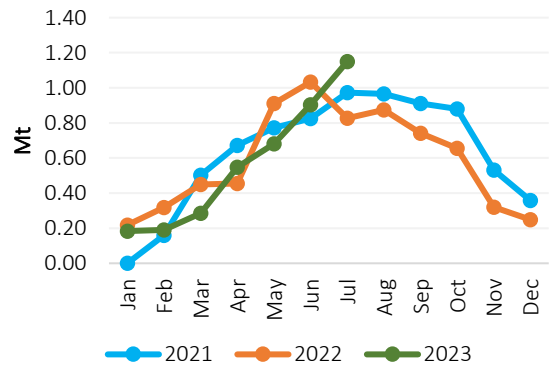
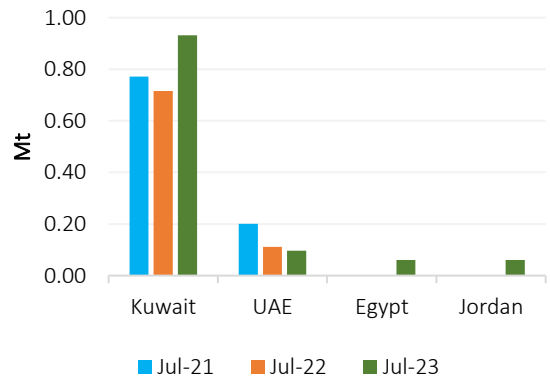


Figure 81: Top LNG importers in MENA



Source: GECF Secretariat based on data from ICIS LNG Edge

4.2.2 LNG Exports

In July 2023, global LNG exports rose sharply by 5.4% (1.71 Mt) y-o-y, reaching 33.60 Mt and a record high for the month of July (Figure 82). Stronger LNG exports from non-GECF countries boosted global LNG exports and offset weaker exports from GECF member countries and LNG reloads. As such, the share of non-GECF countries in global LNG exports increased from 48.6% a year earlier to 51.7% in July 2023. In contrast, the share of GECF member countries and reloads in global LNG exports fell from 50.7% and 0.7%, respectively, to 47.8% and 0.5%, respectively. Between January and July 2023, cumulative global LNG exports expanded by 4.2% (9.60 Mt) y-o-y to reach 238.88 Mt. In July 2023, the US, Qatar and Australia were the top LNG exporting countries (Figure 83).

Figure 82: Trend in global monthly LNG exports

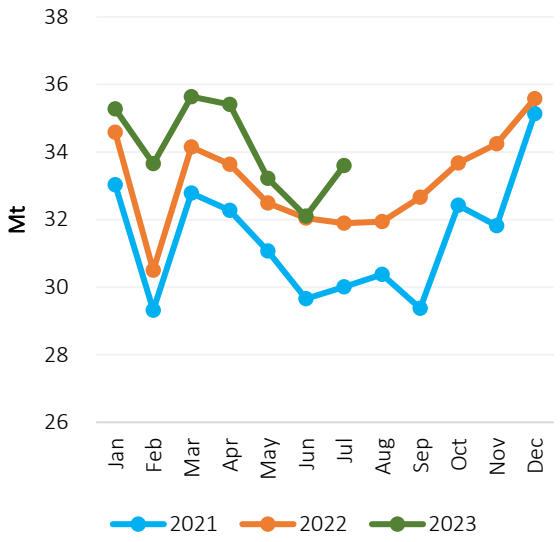
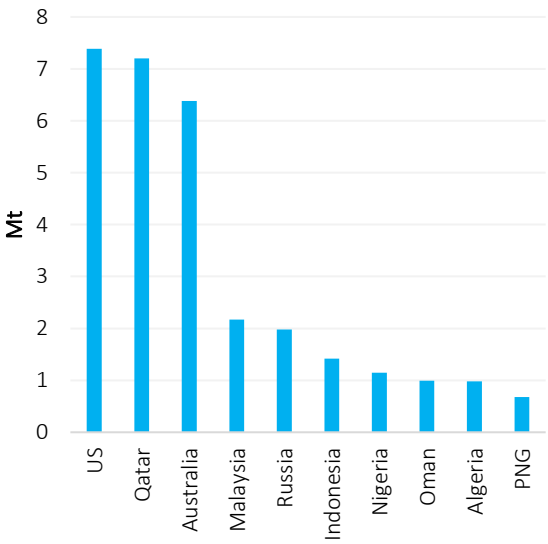


Figure 83: Top 10 LNG exporters in Jul 2023



Source: GECF Secretariat based on data from ICIS LNG Edge

4.2.2.1 GECF

In July 2023, LNG exports from GECF member countries and observers declined for the second consecutive month. GECF countries' LNG exports fell by 0.7% (0.11 Mt) y-o-y to 16.06 Mt (Figure 84). Egypt, Equatorial Guinea, Malaysia, Nigeria, Russia, Trinidad and Tobago and the United Arab Emirates contributed to the decline and offset higher exports from Algeria, Angola, Mozambique, Norway, Peru and Qatar (Figure 85). From January to July 2023, GECF countries' cumulative LNG exports grew by 2.2% (2.13 Mt) y-o-y, totalling 99.93 Mt.

The drop in LNG exports in Malaysia, Russia and Trinidad and Tobago was attributed to higher planned maintenance activity at the MLNG, Sakhalin 2 and Atlantic LNG facilities, respectively. In Egypt and Nigeria, lower feedgas availability led to a decline in LNG exports from both countries. Furthermore, an unplanned outage at the Das Island LNG facility drove the United Arab Emirates' LNG exports lower.

Conversely, lower planned maintenance at the Skikda, Angola and Peru LNG facilities supported higher LNG exports from Algeria, Angola and Peru. Higher feedgas availability also contributed to the increase in Algeria's LNG exports. In Mozambique, the stronger LNG exports were supported by the continued ramp-up in LNG production at the Coral South FLNG facility.

Figure 84: Trend in GECF monthly LNG exports

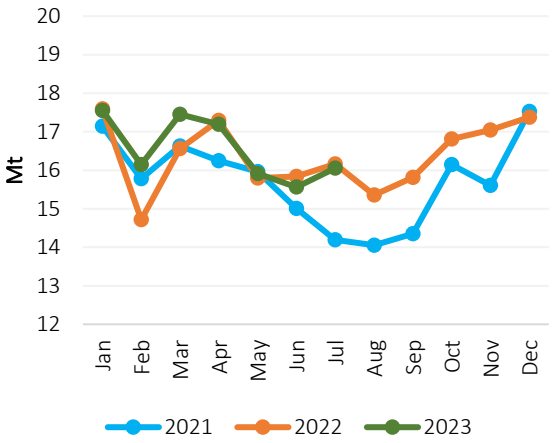
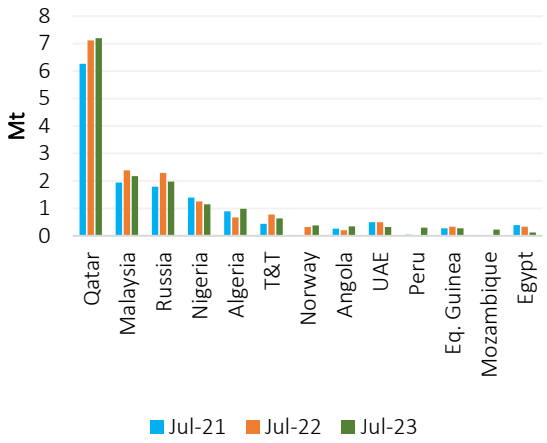


Figure 85: GECF's LNG exports by country



Source: GECF Secretariat based on data from ICIS LNG Edge

4.2.2.2 Non-GECF

In July 2023, LNG exports from non-GECF countries jumped by 12% (1.85 Mt) y-o-y, reaching 17.36 Mt (Figure 86). The stronger LNG exports were driven by Australia, Indonesia and the US, which offset lower exports from Brunei, Cameroon, Oman and Papua New Guinea (Figure 87). Between January and July 2023, non-GECF countries' cumulative LNG exports expanded sharply by 5.7% (6.42 Mt) y-o-y to stand at 120.01 Mt.

In the US, the increase in production at the Freeport LNG facility, combined with the ramp-up in production at the Calcasieu Pass LNG facility, boosted LNG exports. In addition, higher production at the Cameron LNG facility offset lower production at the Cove Point and Sabine Pass LNG facilities because of increased maintenance activity. Meanwhile, lower maintenance activity at the Ichthys, Prelude and QCLNG facilities coupled with stronger production from Wheatstone LNG contributed to the rise in Australia's LNG exports. The decline in exports from the GLNG and Gorgon LNG facilities, amidst higher planned maintenance activity, was also offset by higher exports from the aforementioned LNG facilities. Meanwhile, the increase in Indonesia's LNG exports came mainly from the Bontang LNG facility.

Figure 86: Trend in non-GECF monthly LNG exports

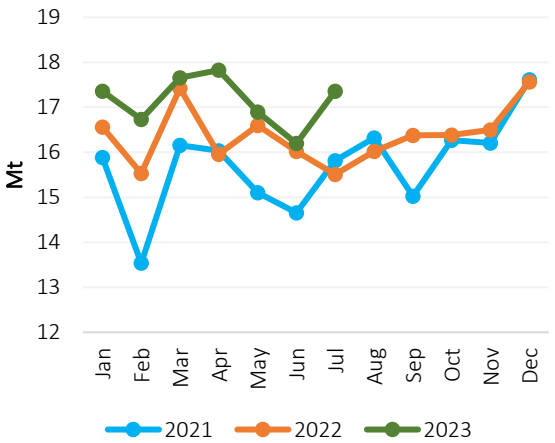
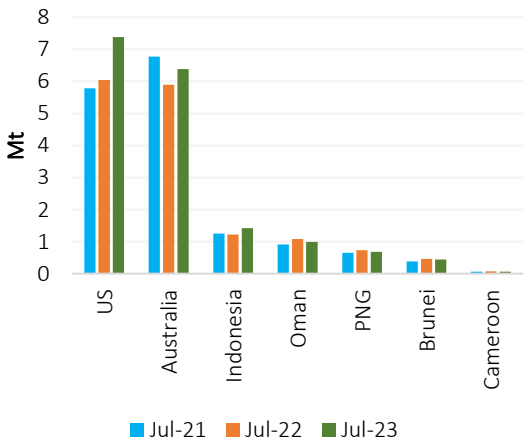


Figure 87: Non-GECF's LNG exports by country



Source: GECF Secretariat based on data from ICIS LNG Edge

4.2.3 Global LNG Reloads

In July 2023, global LNG reloads declined by 18% (0.04 Mt) y-o-y, reaching 0.18 Mt (Figure 88). This is the first decline since January 2023 and the lowest LNG reloads since May 2022. The weaker LNG reloads were driven by Indonesia and Spain, which offset increases in China, Jamaica and Singapore (Figure 89). From January to July 2023, the cumulative global LNG reloads stood at 2.99 Mt, which represent an increase of 74% (1.27 Mt) y-o-y.

In Indonesia, the drop in LNG reloads came mainly from the Arun LNG facility, utilised by some portfolio players, including TotalEnergies, for LNG storage and reloads. No LNG cargoes were reloaded from the Arun LNG terminal in July 2023. Meanwhile, the lower LNG reloads in Spain were attributed to the decrease in LNG imports in Italy, which has been the main market for Spain's LNG reloads. Conversely, higher intra-country trade and the export of an LNG reload to Kuwait supported the increase in Chinese LNG reloads.

Figure 88: Trend in global monthly LNG reloads

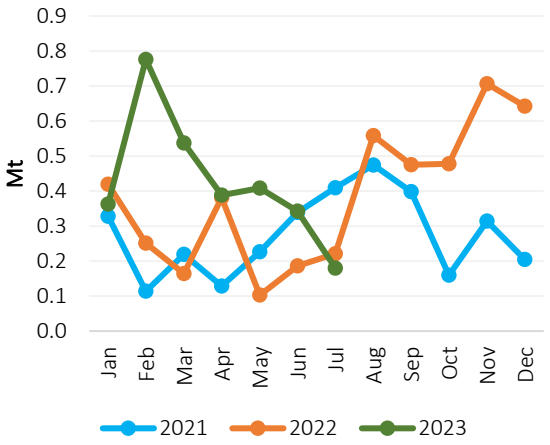
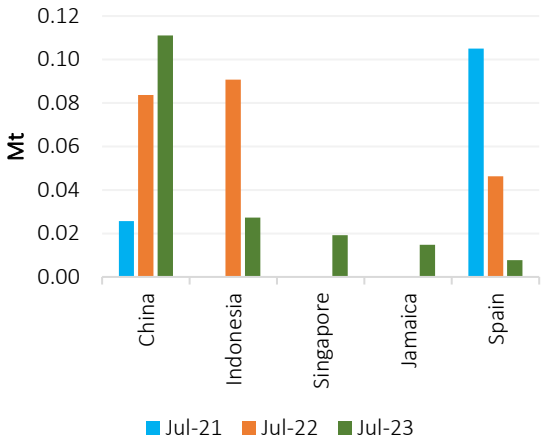


Figure 89: Global LNG reloads by country



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 continued to be out-of-the-money. Despite the increasing spot LNG price spreads between Asia Pacific and Europe, an increase in the spot shipping costs from Europe to Asia Pacific kept the arbitrage opportunity in negative territory (Figure 90). Conversely, the price spread between the spot LNG prices in Asia Pacific and oil-indexed prices in Europe flipped to a premium relative to the spot shipping cost from Europe to Asia Pacific.

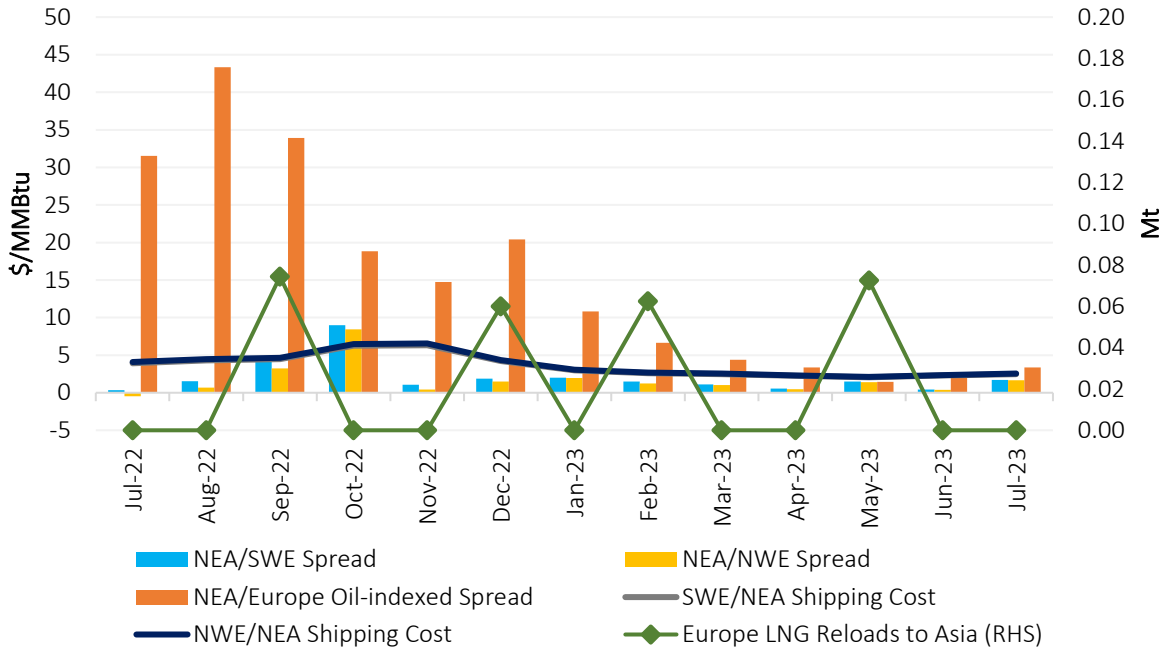
The price spreads between NEA/SWE and NEA/NWE surged by 286% ($1.26/MMBtu) and 326% ($1.27/MMBtu) m-o-m, respectively, reaching $1.70/MMBtu and $1.66/MMBtu, respectively. The stronger price spreads were driven by an increase in the NEA spot LNG price and a decline in European spot LNG prices. Similarly, the price differential between spot LNG prices in Asia and oil-indexed prices in Europe jumped by 54% ($1.19/MMBtu) m-o-m to $3.37/MMBtu.

Meanwhile, the shipping costs for the NEA/SWE and NEA/NWE spot routes increased modestly by 8.3% ($0.19/MMBtu) and 8.5% ($0.20/MMBtu), respectively, to reach $2.47/MMBtu and $2.55/MMBtu, 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 unprofitable arbitrage opportunity prevented spot LNG reloads from Europe to Asia Pacific in July 2023.

Moreover, the NEA/SWE and NEA/NWE price differentials skyrocketed by 386% (1.35/MMBtu) and 439% ($2.15/MMBtu) y-o-y, respectively. In contrast, the price spread between NEA spot LNG and European oil-indexed gas prices, as well as the NEA/SWE and NEA/NWE spot shipping costs, fell by 89% ($28.15/MMBtu), 37% ($1.45/MMBtu), respectively, and 38% ($1.52/MMBtu) y-o-y, respectively.

Figure 90: 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

El Musel LNG terminal in Spain received its first LNG cargo – On July 1, 2023, the El Musel LNG terminal in Spain received its first LNG cargo. The LNG facility has a capacity of 5.2 Mtpa and was completed in 2013, however, the facility has been mothballed since its completion. ExxonMobil delivered the first LNG cargo to Enagas from the Calcasieu Pass LNG facility in the US. The facility will be utilised for LNG storage and reload operations to other European countries.

Thi Vai LNG terminal in Vietnam received its commissioning LNG cargo: On July 10, 2023, Vietnam joined the rank of LNG importers after receiving its first LNG cargo at the Thi Vai LNG terminal. Shell delivered the LNG cargo from the Bontang LNG facility in Indonesia to PetroVietnam. The Thi Vai LNG facility has a capacity of 1 Mtpa. The second phase of the expansion will increase the terminal's capacity to 3 Mtpa and expected to be completed after 2025.

NextDecade takes FID on Rio Grande LNG phase 1 – On June 12, 2023, NextDecade took a final investment decision (FID) on the first phase of the Rio Grande LNG facility. The first phase is expected to cost $18.4 billion and will have a capacity of 17.6 Mtpa with commissioning expected in 2027. Approximately 92% of the nameplate liquefaction capacity has been tied

to long-term contracts with several international market players, including TotalEnergies, Shell, Engie, ExxonMobil, ENN, Gunagdong Energy Group, China Gas Hongda Energy Trading Co., Galp Trading and Itochu Co.

NNPC and UTM Offshore signed a HOA for FLNG project – On July 20, 2023, the Nigerian National Petroleum Company (NNPC) and UTM Offshore Limited signed a Heads of Term Agreement (HOA) to develop a floating LNG (FLNG) project in Nigeria. The FLNG will have a capacity of 1.5 Mtpa and will reduce flared gas and CO_2 emissions in the country. According to UTM Offshore Limited, the project also is expected to create more than 7,000 jobs and boost economic growth and development in Nigeria.

Second round of EU joint gas purchasing completed – The second round of the EU joint gas purchasing took place between June 26 and July 10, 2023. During the demand aggregation phase, buyers registered 15.92 bcm of their gas purchase needs. Around 25 global gas suppliers offered a total gas supply of 15.19 bcm during the tender phase, which took place from July 7-10, 2023. Prisma, the operator of the gas-purchasing platform, matched 12 bcm of gas supply offers with the gas demand needs of buyers, higher than the 10.9 bcm of gas matched during the first round. Both gas buyers and suppliers were informed of the results and the parties then engaged in the negotiation for the potential Sales and Purchase Agreements (SPAs).

In terms of LNG agreements, six contracts were signed in July 2023, as shown in Table 2 below.

Table 2: New LNG sale agreements signed in July 2023

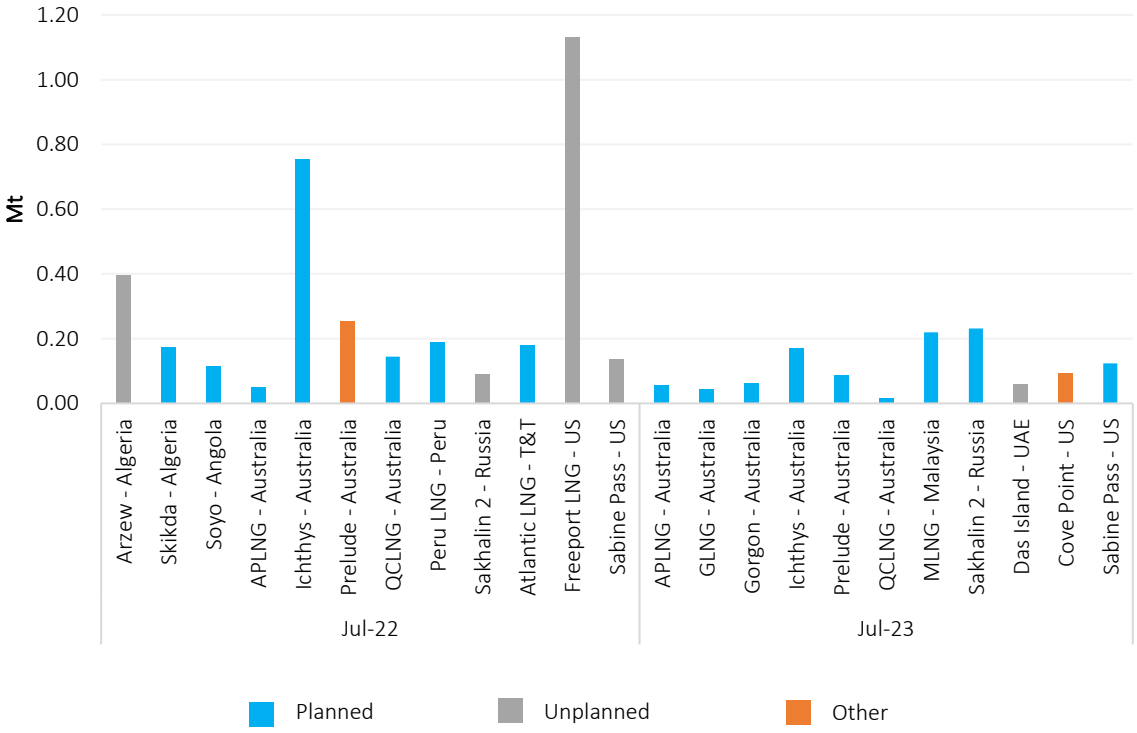
Contract Type	Exporting Country	Project	Seller	Importing Country	Buyer	Volume (Mtpa)	Duration (Years)
SPA	Mexico	Saguaro Energia LNG	Mexico Pacific	China	Zheijang Energy	1	20
SPA	US	Delfin LNG	Delfin Midstream	UK	Centrica	1	15
SPA	Portfolio		Shell	Morocco	ONEE	0.37	12
SPA	UAE		ADNOC LNG	India	Indian Oil Corp.	1.2	14
SPA	Portfolio		TotalEnergies	India	Indian Oil Corp.	0.8	10
SPA	Portfolio		BP	Portfolio	OMV	1	10

Source: GECF Secretariat based on Project Updates and News

4.2.6 Maintenance Activity at LNG Liquefaction Facilities

In July 2023, the total planned maintenance and unplanned outages at global liquefaction facilities stood at 1.17 Mtpa, less than half of the 3.61 Mtpa of global liquefaction capacity impacted in July 2022 (Figure 91). During the month of July, the APLNG, GLNG, Gorgon, Ichthys, Prelude and QCLNG facilities in Australia, Bintulu LNG facility in Malaysia, Sakhalin 2 LNG facility in Russia and Sabine Pass LNG facility in the US underwent scheduled maintenance activity. Meanwhile, the Das Island LNG facility in the United Arab Emirates and the Cove Point LNG facility in the US were impacted by unplanned and other outages, respectively.

Figure 91: Maintenance activity at LNG liquefaction facilities during July (2022 and 2023)



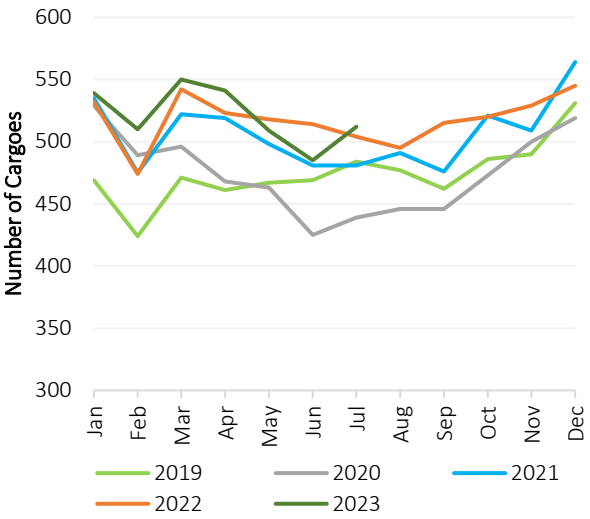
Source: GECF Secretariat based on information from Argus, ICIS LNG Edge and Refinitiv

4.2.7 LNG Shipping

In July 2023, the total number of LNG export cargoes rose by 6% m-o-m to reach 512 (Figure 92). After the first seven months of the year, the total number of shipments amounted to 3,646, a 1% increase (39 cargoes) compared with the same period in 2022 (Figure 93).

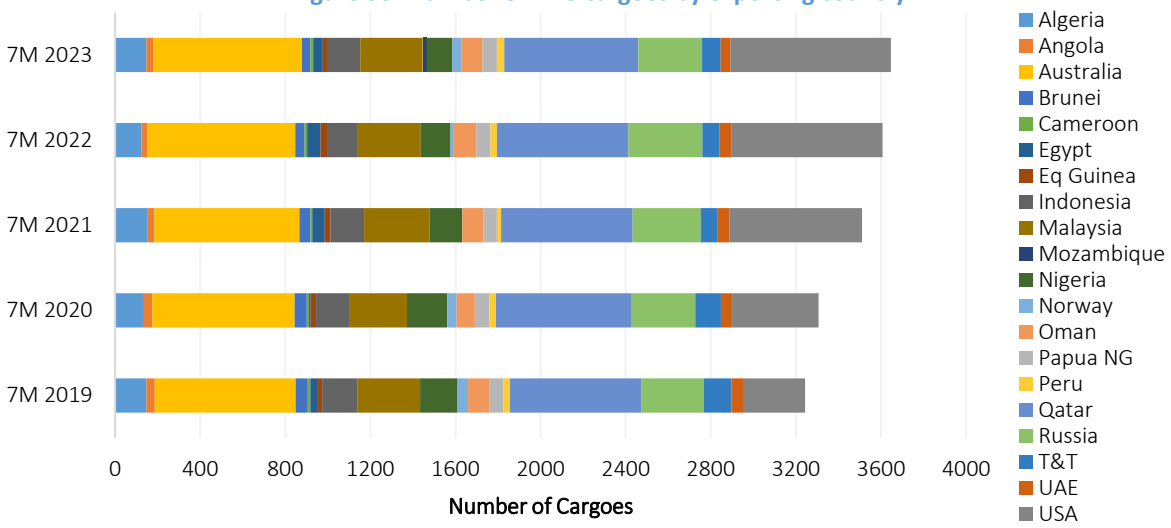
In 2023 thus far, there were significant increases in cargo deliveries from the US (42 cargoes), Norway (30) and Algeria (24), compared to the same period in 2022 (Figure 94). Excluding Norway, the largest relative year-to-date increases in 2023 were observed in Algeria (20%,) Angola (18%) and Peru (13%). The abnormally large increase in shipments from Norway is a result of exports being restarted in June 2022.

Figure 92: Number of LNG export cargoes



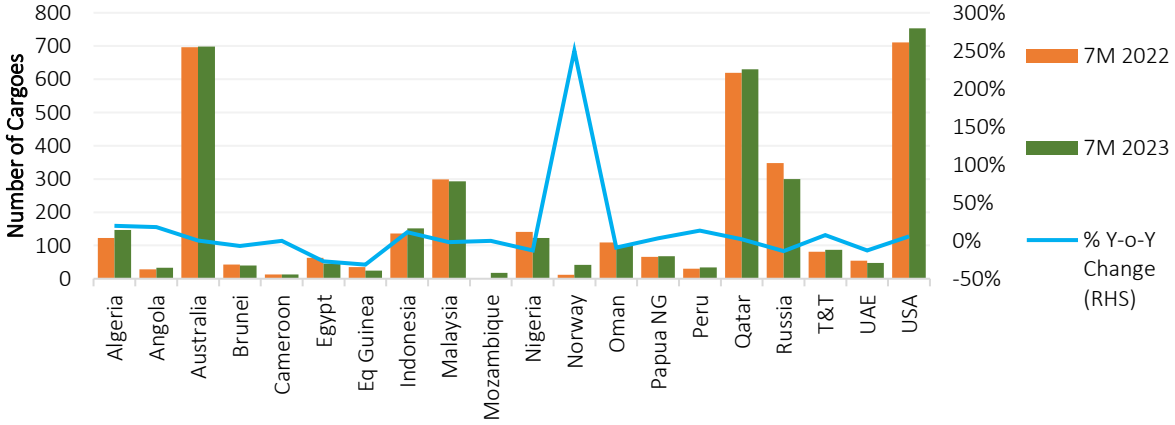
Source: GECF Secretariat based on data from ICIS LNG Edge

Figure 93: Number of LNG cargoes by exporting country



Source: GECF Secretariat based on data from ICIS LNG Edge

Figure 94: Changes in LNG cargo exports



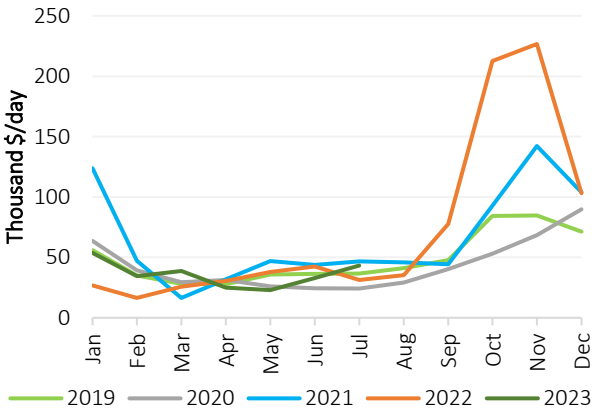
Source: GECF Secretariat based on data from ICIS LNG Edge

The spot charter rate for steam turbine LNG carriers increased to an average of $43,100 per day in July 2023, marking a 31% rise m-o-m, and 38% above the levels observed in July 2022 (Figure 95). The monthly variation with the five-year historical average has now flipped, with the charter rate for steam turbine vessels now $6,100 higher. The other segments of the LNG carrier fleet both observed increases in their average monthly spot charter rate: TDFE-propelled vessels by 28% m-o-m to reach $66,400 per day, and two-stroke propelled vessels by 21% m-o-m to reach $91,400 per day.

While there was an increase in the average monthly spot charter rate for steam turbine LNG carriers, the daily rates remained constant for the majority of the month, maintaining the level at which they ended June. The arbitrage between the Atlantic and Pacific basins, resulting in rate gains at the end of June, was influenced by weakening demand for cargoes in some Asian countries due to high inventory and slightly raised loading activity in the US. In addition, similar to this period last year, charterers have been limiting sailings within the Atlantic Basin, keeping vessels available to be used as floating storage around Europe in the upcoming winter. The net effect of these fundamentals has translated to stability in the charter market during the month.

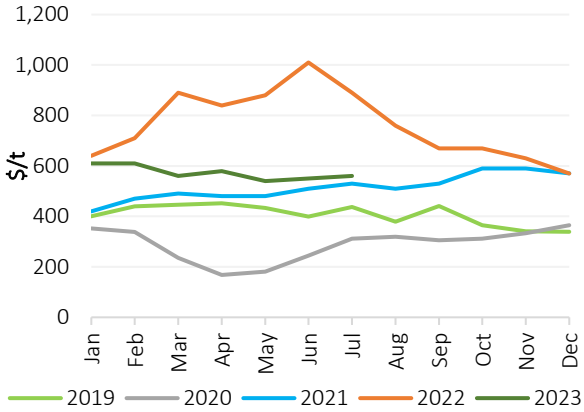
The average price of the leading shipping fuels was $560 per tonne in July 2023, a 2% increase from the previous month, but 37% lower y-o-y (Figure 96).

Figure 95: Average LNG spot charter rate



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

Figure 96: Average price of shipping fuels



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 July 2023 is shown in Table 3.

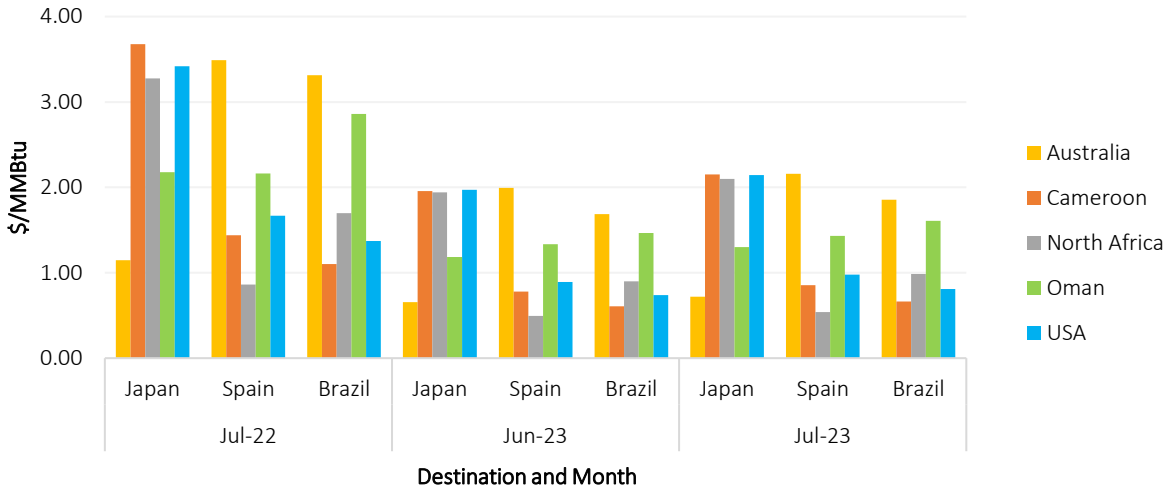
Table 3: Shipping costs for LNG spot cargoes from selected regions ($/MMBtu) – July 2023

	Destination							
LNG Supplier	From \ To	Japan	China	India	UK	Spain	Argentina	Brazil
	Spot LNG delivered price	10.87	10.87	10.47	9.25	9.52	9.87	9.50
	Australia	0.72	0.76	0.87	2.22	2.16	1.70	1.85
	Cameroon	2.15	2.13	1.42	0.93	0.86	1.00	0.66
	North Africa	2.10	2.09	1.18	0.61	0.54	1.40	0.99
	Oman	1.30	1.21	0.28	1.50	1.43	1.63	1.61
	USA	2.14	2.36	2.28	1.00	0.98	1.34	0.81

Source: GECF Shipping Cost Model

In July 2023, the LNG carrier spot charter rate increased m-o-m, while the cost of LNG shipping fuels and the delivered spot LNG prices were relatively unchanged. These factors combined to have a net increase on the LNG shipping costs by up to $0.20/MMBtu compared to the previous month (Figure 97). Moreover, when compared to the same month in the previous year, fuel prices and delivered spot LNG prices were all significantly lower in July 2023, while charter rates were marginally higher. This resulted in LNG shipping costs being up to $1.53/MMBtu lower.

Figure 97: LNG spot shipping costs for steam turbine carriers



Source: GECF Shipping Cost Model

Gunvor Group and Celsius Tankers to partner on LNG carriers: Gunvor Group, one of the leading commodities trading houses worldwide, has entered into a joint venture with Celsius Tankers for the acquisition of four LNG carriers. Celsius Tankers already controls a fleet of over forty vessels, including LNG carriers. The four new vessels, each with a capacity of 180,000 m^3, will be fitted with technologies such as reliquefaction, hull optimisation, low-friction surface coating and air lubrication. These advancements are all aimed at reducing carbon emissions and methane slip. The carriers will be built by China Merchants Heavy Industry and are expected to come into operation in 2026 and 2027.

Hyundai Heavy Industries to analyse the lifecycle carbon emissions of LNG shipping: South Korean shipbuilding firm Hyundai Heavy Industries (HHI) is embarking on a novel initiative to determine the carbon dioxide emissions over the entire lifecycle of an LNG carrier. HHI will conduct the analysis on one of the new 174,000 m^3 vessels, currently in the final stages of construction. HHI will measure the emissions relating to the shipbuilding stage, including procurement of the raw materials. During the operations phase, the carbon data will be modelled using tools developed by Lloyd's Register.

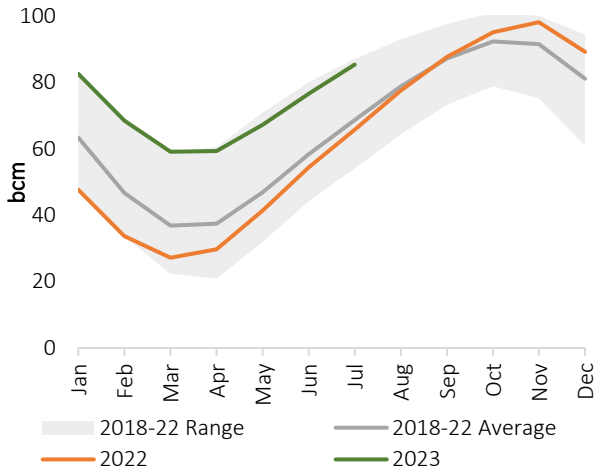
5 Gas Storage

5.1 Europe

In the EU, member states continue to restock their underground gas storage (UGS) facilities, in line with the region's target of filling storage sites to at least 90% of capacity by November 1, 2023. The total working capacity for UGS sites in the EU currently stands at 104 bcm.

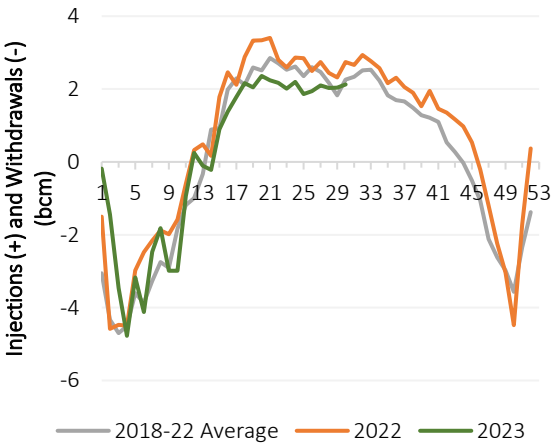
In July 2023, the average daily volume of gas in storage rose to 85.4 bcm, up from 76.6 bcm recorded in the previous month (Figure 98). This monthly average volume of gas was 19.6 bcm higher compared to July 2022 and 16.7 bcm higher than the 5-year historical average. The average UGS capacity utilization in the region increased to 82%. Throughout July, a total of 9.8 bcm of gas was injected into UGS facilities, while gas withdrawals amounted to 1.1 bcm.

Figure 98: Underground gas storage in the EU



Source: GECF Secretariat based on data from AGSI+

Figure 99: Weekly rate of EU UGS level changes



Source: GECF Secretariat based on data from AGSI+

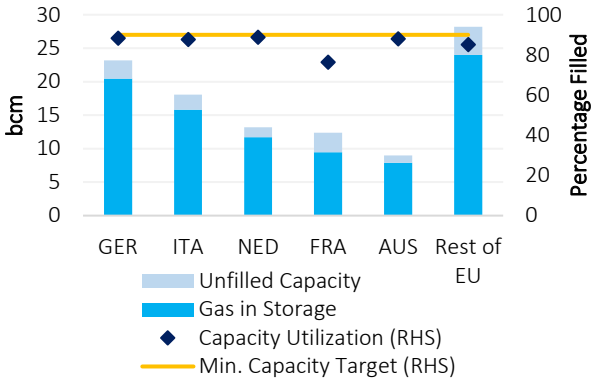
In July 2023, net gas injections were observed during 30 days of the month at an average injection rate of 2.0 bcm/week. The 2023 average injection rate is lower than the 2.5 bcm/week recorded in July 2022 and the 2.3 bcm/week for the same month during the last five years (Figure 99). This reduced rate is a consequence of the region starting the restocking season with a high level of gas remaining in storage, after the 2022/23 winter ended.

The EU has set a target to achieve a regional average level filling of 90% by November 1, 2023, with targets for the storage level set for points throughout the gas storage season. According to this filling trajectory, by July 31, 2023, there was approximately 28 bcm more gas accumulated in the region than originally targeted. As a result, only 4.3 bcm is now required to meet the 90% target.

By the end of July 2023, Germany, Italy, Austria and the Netherlands have each filled their UGS sites to almost 90% of their capacity (Figure 100). France is currently at 76% filled, having undergone a large withdrawal of gas during the protest action at its LNG imports terminals earlier this year.

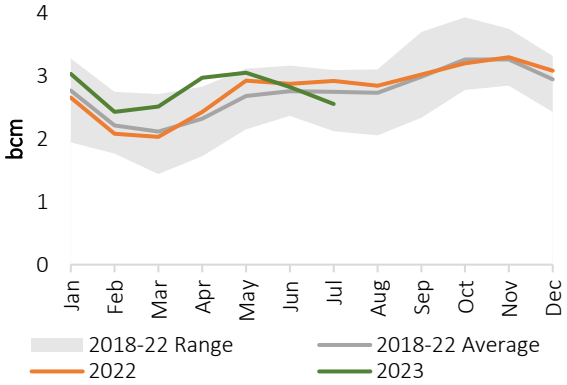
The EU has a total LNG storage capacity of 5.0 bcm, primarily concentrated in Spain (40%) and France (16%). In July 2023, the total amount of LNG stored in the EU continued to decline, reaching 2.6 bcm (Figure 101). This quantity of LNG was 10% lower than in the previous month, due to lower LNG imports in July. Similarly, the level of LNG in storage was 13% lower than one year ago.

Figure 100: UGS in EU countries as of July 31, 2023



Source: GECF Secretariat based on data from AGSI+

Figure 101: Total LNG storage in the EU



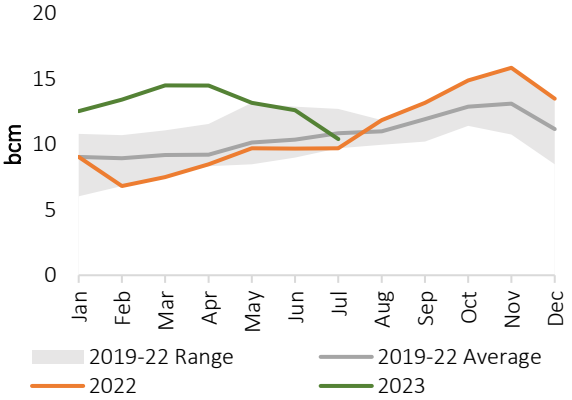
Source: GECF Secretariat based on data from ALSI

5.2 Asia

Japan and South Korea possess LNG storage capacities of 9.8 bcm and 6.8 bcm, respectively. In July 2023, the total volume of LNG in storage in both countries fell to an estimated 10.4 bcm (Figure 102), of which Japan accounted for 5.0 bcm, and South Korea 5.4 bcm. This total quantity was 18% lower m-o-m but 7% higher y-o-y and was 0.4 bcm lower than the four-year average.

Storage levels have fallen due to gas demand from the power sector, required for cooling due to a heatwave in the region.

Figure 102: LNG in storage in Japan and South Korea

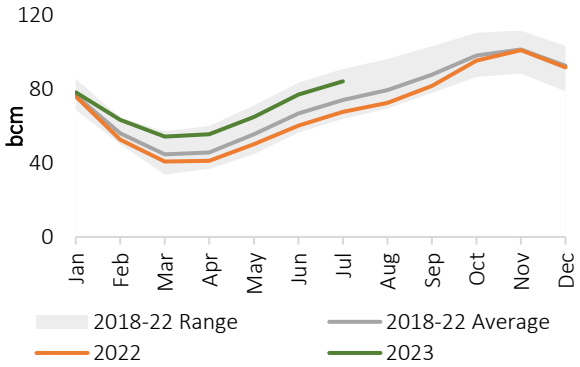


Source: GECF Secretariat based on data from Refinitiv

5.3 North America

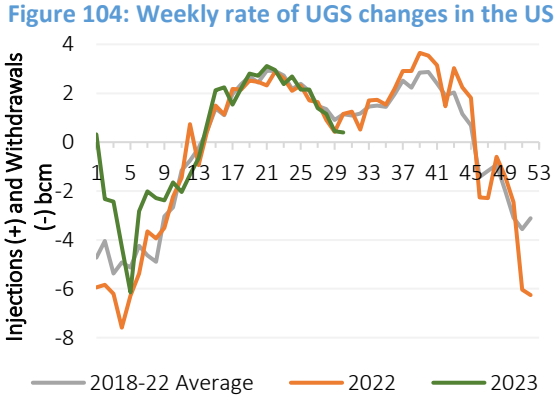
Net gas injections continued in the US in July 2023, with the average daily volume of gas in storage rising to 84.2 bcm from 77.0 bcm in the previous month (Figure 103). This amount was 16.5 bcm higher than in July 2022 and 10.1 bcm higher than the 5-year historical average. The total working gas storage capacity in the US is 134 bcm, and the average UGS capacity utilization by July rose to 63%. With storage levels already high, stock build occurred at an average rate of just 0.8 bcm/week, compared with 1.0 bcm/week in 2022 and 1.2 bcm/week for the 5-year average (Figure 104).

Figure 103: Underground gas storage in the US



Source: GECF Secretariat based on data from US EIA

Figure 104: Weekly rate of UGS changes in the US



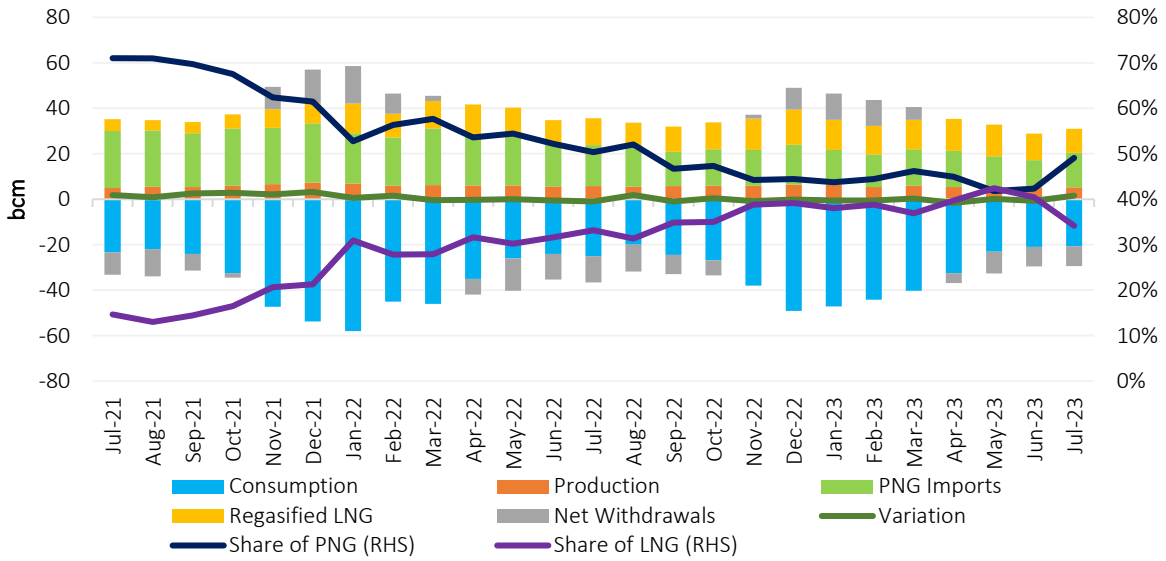
Source: GECF Secretariat based on data from US EIA

6 Gas Balance

6.1 EU + UK

In July 2023, the share of pipeline gas imports in the EU + UK's gas supply mix rose sharply m-o-m from 42% to 49%. On a y-o-y comparison, the share of pipeline gas imports reduced modestly by one percentage point from July 2022. In contrast, the share of regasified LNG fell sharply by six percentage points m-o-m to 34% but increased by one percentage point y-o-y (Figure 105). The sharp decline in the share of regasified LNG was driven by a m-o-m drop in regasified LNG sendout into the EU + UK's gas market while pipeline gas imports grew significantly. The shifting reliance from PNG to LNG imports in the EU + UK since 2022 was driven by the EU's targeted reduction in gas imports from Russia.

Figure 105: 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 4 below provides data on the gas supply and demand balance for the EU + UK for the month of July 2023.

Table 4: EU + UK gas supply/demand balance for July 2023 (bcm)

	2022	Jun-22	Jun-23	YTD 2022	YTD 2023	Change* y-o-y	Change** 2023/2022
(a) Gas Consumption	417.40	25.00	20.70	259.00	228.60	-17%	-12%
(b) Gas Production	72.72	5.86	5.20	42.83	38.40	-11%	-10%
Difference (a) - (b)	344.68	19.14	15.50	216.17	190.21	-19%	-12%
PNG Imports	230.46	17.97	15.21	148.70	102.80	-15%	-31%
Regasified LNG	146.57	11.84	10.59	83.75	88.96	-11%	6%
Net Withdrawals	-31.79	-11.56	-8.66	-16.13	-2.66	-25%	-84%
Variation	-0.55	0.89	-1.63	-0.15	1.11		

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 5 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 April 2023.

Table 5: OECD's gas supply/demand balance for April 2023 (bcm)

	2022	Apr-22	Apr-23	YTD 2022	YTD 2023	Change* y-o-y	Change** 2023/2022
(a) OECD Gas Consumption	1803.1	138.9	136.9	679.3	664.0	-1.5%	-2.3%
(b) OECD Gas Production	1651.0	134.3	139.7	533.6	560.1	4.0%	5.0%
Difference (a) - (b)	152.1	4.6	-2.8	145.7	103.9	-161.1%	-28.7%
OECD LNG Imports	346.9	28.0	29.0	120.9	124.0	3.5%	2.6%
LNG Imports from GECF	161.8	13.0	12.7	54.7	55.6	-2.1%	1.8%
LNG Imports from Non-GECF	185.1	15.0	16.3	66.2	68.4	8.4%	3.2%
OECD LNG Exports	223.2	18.0	73.6	20.7	80.0	309.0%	285.9%
Intra-OECD LNG Trade	152.7	12.2	14.0	53.9	56.2	14.8%	4.3%
OECD Pipeline Gas Imports	630.3	59.3	43.1	237.5	177.7	-27.4%	-25.2%
OECD Pipeline Gas Exports	562.7	50.4	-11.8	251.3	168.9	-123.5%	-32.8%
Stock Changes and losses	39.2	14.3	13.2	-59.3	-51.1		

Source: GECF Secretariat based on data from ICIS LNG Edge and IEA Monthly Gas Statistics
(*): y-o-y change for Apr 2023 compared to Apr 2022
(**): y-o-y change for YTD 2023 compared to YTD 2022

6.3 India

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

Table 6: India's 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) India Gas Consumption	60.96	5.01	5.07	30.57	30.17	1.2%	-1.3%
(b) India Gas Production	33.46	2.75	2.85	16.53	16.75	3.6%	1.3%
Difference (a) - (b)	27.50	2.26	2.22	14.04	13.42	-1.6%	-4.4%
India LNG Imports	28.07	2.58	2.42	14.59	14.30	-6.2%	-2.0%
LNG Imports from GECF	22.15	2.08	1.93	12.19	11.54	-7.1%	-5.4%
LNG Imports from Non-GECF	5.92	0.50	0.49	2.40	2.76	-2.6%	15.0%
Stock Changes and losses	0.57	0.32	0.20	0.55	0.88		

Source: GECF Secretariat based on data from ICIS LNG Edge and India's PPAC
(*): y-o-y change for Jun 2023 compared to Jun 2022
(**): y-o-y change for YTD 2023 compared to YTD 2022

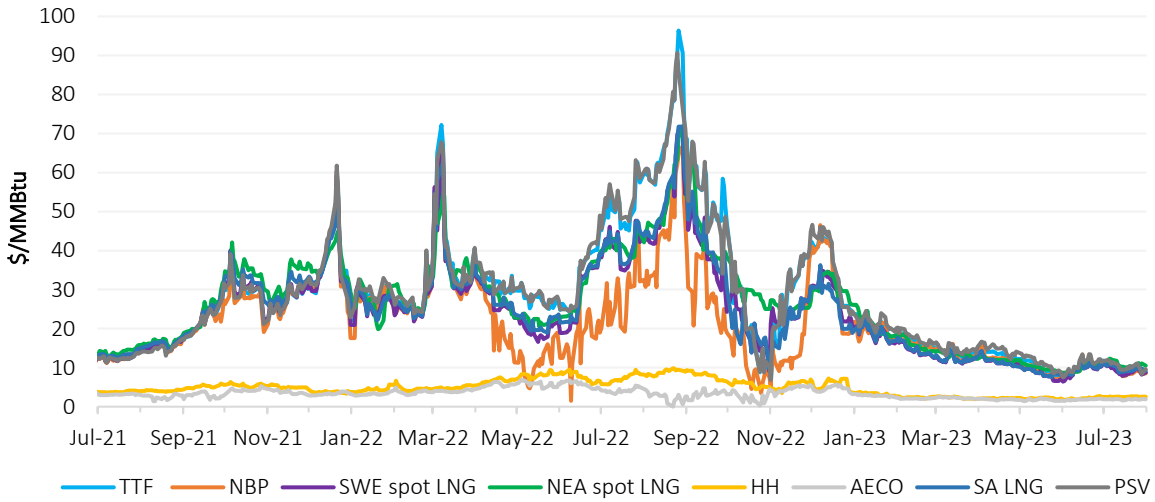
7 Energy Prices

7.1 Gas Prices

7.1.1 Gas & LNG Spot Prices

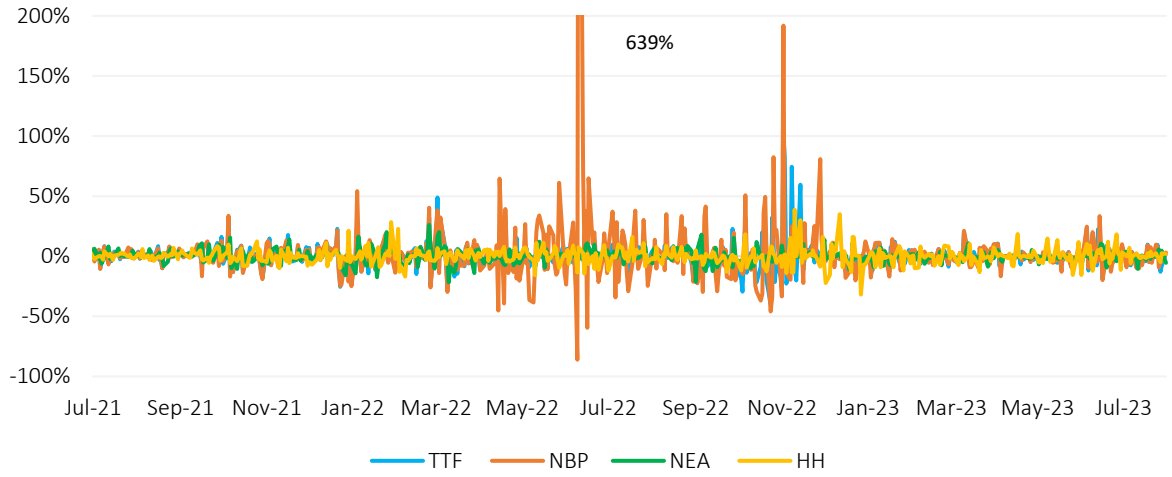
In July 2023, gas and LNG spot prices in Europe and Asia reversed the previous month's gains with overall bearish market fundamentals. Additionally, spot price volatility was relatively low (Figure 106 and Figure 107). Global gas market fundamentals remain relatively weak due to weak demand in both Europe and Asia, as well as high EU gas storage levels. However, increasing buying activity from LNG importers in South and Southeast Asia will likely support prices in the upcoming months.

Figure 106: 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 107: Daily variation of spot prices

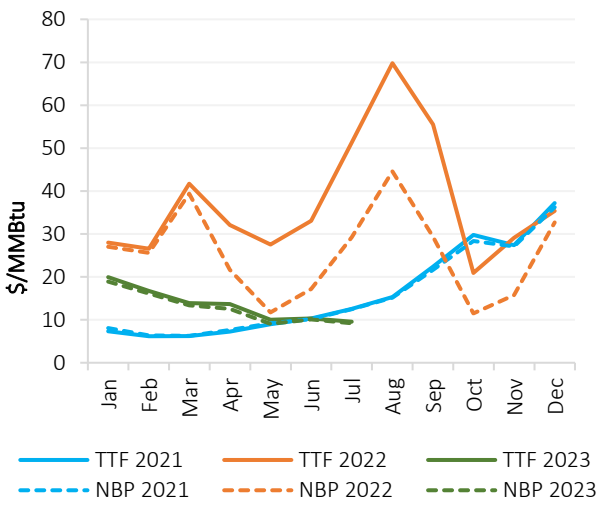


Source: GECF Secretariat based on data from Argus and Refinitiv Eikon

7.1.1.1 European Spot Gas and LNG Prices

In July 2023, average TTF and NBP spot gas prices were $9.56/MMBtu (8% decrease m-o-m) and $9.16/MMBtu (9% decrease m-o-m), respectively, as shown in Figure 108. In addition, these spot prices were lower by 81% y-o-y for TTF and 69% y-o-y for NBP. The SWE spot LNG prices averaged $9.18/MMBtu in July 2023, marking a 5% decrease m-o-m and a 78% decrease y-o-y. As for the PSV spot price, it averaged $10.39/MMBtu in July 2023, a 5% decrease m-o-m and an 80% decline y-o-y.

Figure 108: Monthly European spot gas prices



Source: GECF Secretariat based on data from Refinitiv Eikon

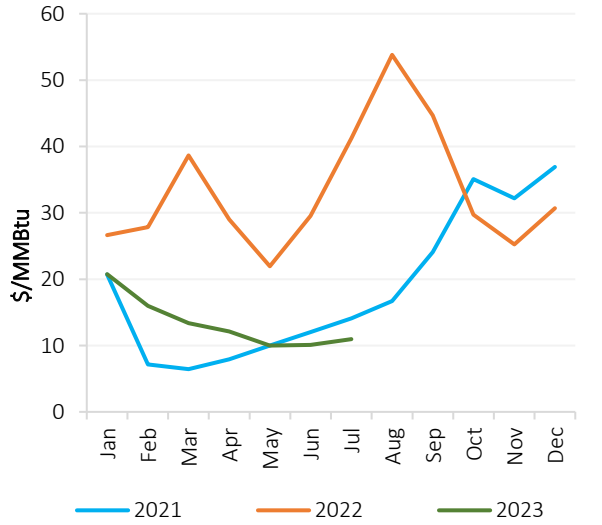
European gas and LNG spot prices dipped due to an uptick in pipeline gas supply from Norway. This increase was a result of maintenance activities ending at several gas and LNG facilities, including the Nyhamna gas processing plant, which resumed operations on July 15, 2023. Additionally, a loose UK market balance contributed to increased flows through the IUK and BBL interconnectors. Moreover, softer gas demand in the region, coupled with high gas storage levels, exerted further downward pressure on prices. As a result, daily TTF spot prices dropped below $8/MMBtu.

From January to July 2023, TTF and NBP averaged $13.45/MMBtu and $13.30/MMBtu, respectively, representing substantial declines of 61% and 48% y-o-y, respectively.

7.1.1.2 Asian Spot LNG Prices

In July 2023, the average North East Asia (NEA) spot LNG price experienced an increase of 8% m-o-m, reaching an average of $10.88/MMBtu. This represents a 74% decrease compared to the same period last year (Figure 109).

Figure 109: Monthly Asian spot LNG prices



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

Asian LNG prices experienced bullish movement, driven by increasing buying activity from LNG importers in South and Southeast Asia. Notably, at the beginning of the month, daily NEA spot LNG prices surpassed $12/MMBtu at the beginning of the month.

From January to July 2023, the average NEA spot LNG price stood at $13.30/MMBtu, representing a 57% y-o-y decrease.

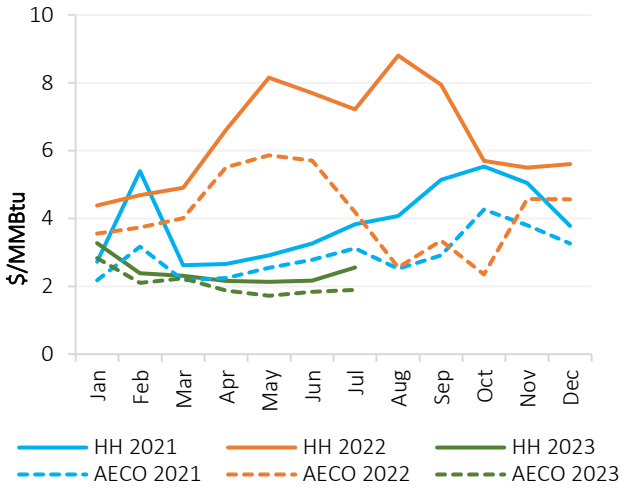
7.1.1.3 North American Spot Gas Prices

In July 2023, the HH spot gas price averaged $2.55/MMBtu, reflecting a sharp increase of 18% m-o-m. However, it was significantly lower y-o-y, dropping by 65%, compared to the average price of $7.21/MMBtu observed in July 2022. (Figure 110).

Henry Hub prices increased sharply during the month due to increased gas demand for cooling. However, gas storage levels remained higher than the five-year average. Moreover, daily HH spot prices reached a high of $2.68/MMBtu during the period.

Similarly, in Canada, the AECO spot price increased by 3% m-o-m, averaging $1.89/MMBtu in July 2023, however it was 55% lower y-o-y.

Figure 110: Monthly North American gas spot prices



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

From January to July 2023, the HH spot price averaged $2.42/MMBtu, representing a significant 61% y-o-y decrease. The AECO spot price averaged $2.07/MMBtu, marking a substantial 56% y-o-y decrease.

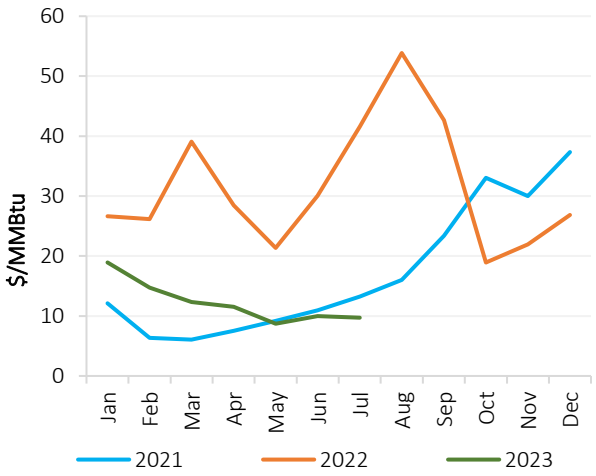
7.1.1.4 South American Spot LNG Prices

In July 2023, the South American (SA) LNG price experienced a 3% m-o-m decrease, averaging $9.70/MMBtu. However, this price was 77% lower compared to the average price of $41.59/MMBtu observed in July 2022 (Figure 111).

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 $9.71/MMBtu, $9.47/MMBtu and $9.93/MMBtu, respectively.

From January to July 2023, the SA LNG spot price averaged $12.27/MMBtu, marking a substantial 60% y-o-y decrease.

Figure 111: 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 July 2023, the average Oil-indexed I LNG price was $12.33/MMBtu, representing a decrease of 1% m-o-m and a 25% y-o-y. Similarly, the Oil-indexed II LNG price averaged $9.02/MMBtu, showing a 2% m-o-m and a 29% y-o-y decrease (Figure 112). Additionally, the Oil-indexed I prices held an average premium of $1/MMBtu over NEA spot LNG prices. Meanwhile, the Oil-indexed II prices held an average discount of $2/MMBtu compared to the NEA spot LNG prices.

In Europe, the Oil-indexed III price averaged $8.11/MMBtu in July 2023, reflecting a 2% m-o-m decrease, and a 12% y-o-y decrease (Figure 113). Moreover, the average SWE LNG retained a premium of $1/MMBtu over the Oil-indexed III price.

From January to July 2023, the Oil-indexed I LNG price exhibited a 6% y-o-y decrease, while the Oil-indexed II LNG price demonstrated a 15% y-o-y decrease. Additionally, the Oil-indexed III LNG price for the same period experienced a 5% y-o-y increase.

Figure 112: Asia: Spot and oil-indexed price spread

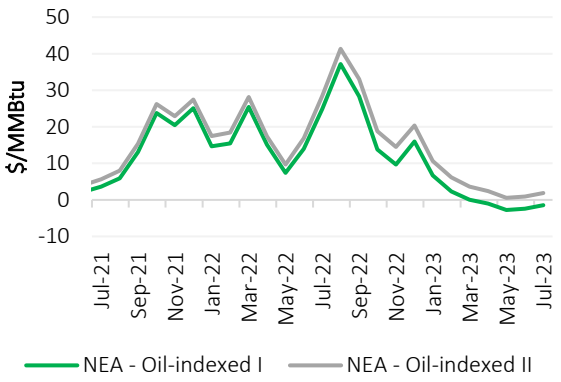
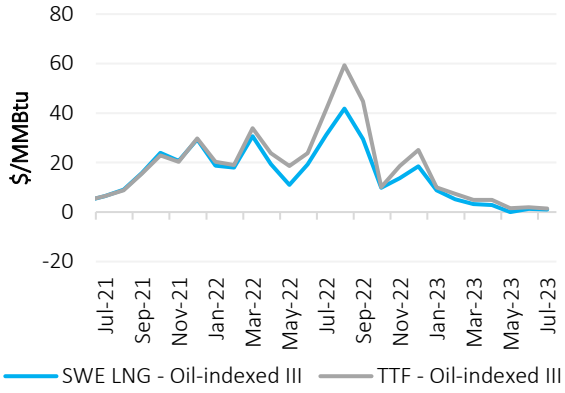


Figure 113: Europe: Spot and oil-indexed price spread



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 July 2023, the average NEA-TTF price spread turned positive, with the average NEA LNG spot price gaining a premium of $1.32/MMBtu over the average TTF spot price (Figure 114). NEA spot LNG prices found some upward momentum, while TTF spot prices experienced downward movement during the month.

NBP traded at a discount of $0.40/MMBtu compared to TTF, which was higher than the average discount of $0.25/MMBtu in the previous month (Figure 115). The NBP-TTF spread widened due to a loosening balance in the UK, which resulted in a larger drop in NBP prices.

Furthermore, the NWE LNG spot price traded at a narrower discount of $0.34/MMBtu compared to TTF (Figure 116). The completion of some maintenance activities resulted in an increase in LNG sendout in the region. The NWE LNG-SA LNG price spread remained negative, averaging $0.48/MMBtu (Figure 117). The NEA-HH spread widened to $8.33/MMBtu, while the TTF-HH spread narrowed to $7.01/MMBtu (Figure 118 and Figure 119). Thus, Asian spot prices held a higher premium over North American spot prices during the month.

Figure 114: NEA-TTF price spread

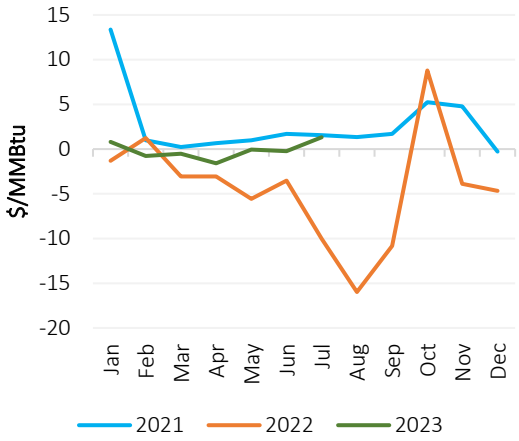


Figure 115: NBP-TTF price spread

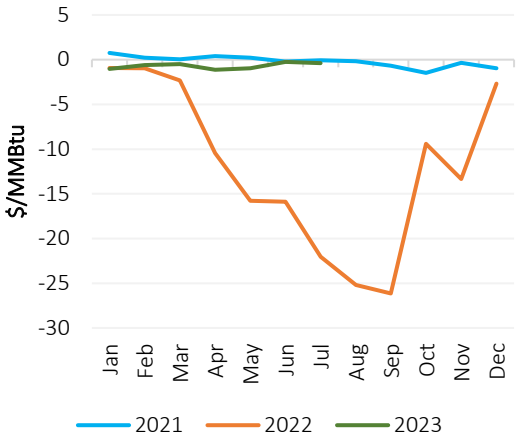


Figure 116: NWE LNG-TTF price spread

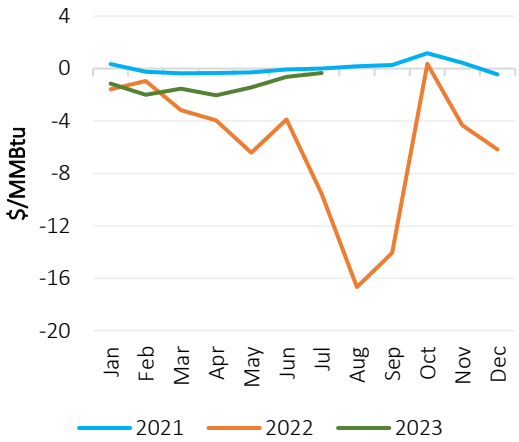


Figure 117: NWE LNG – SA LNG price spread

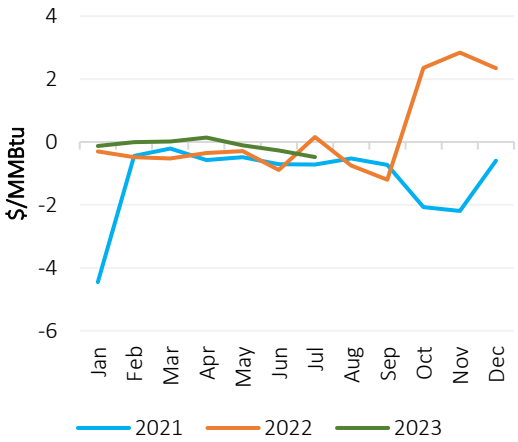


Figure 118: NEA-HH price spread

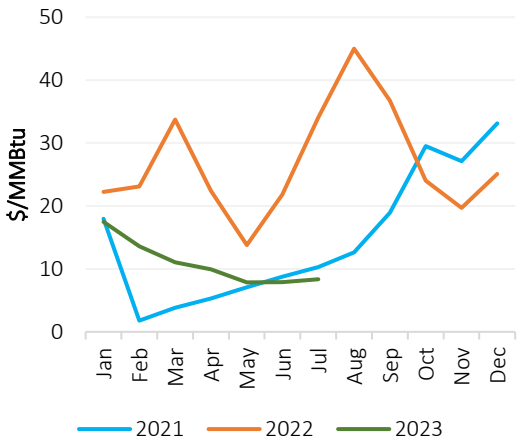
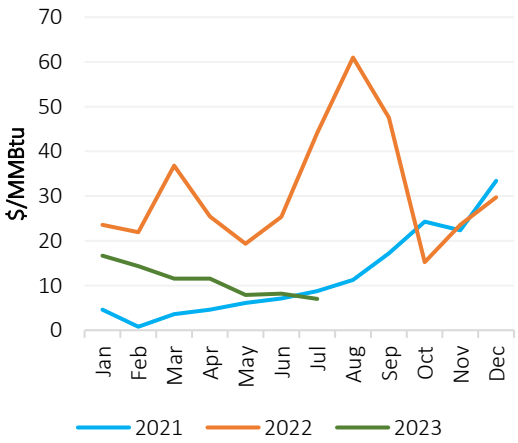


Figure 119: TTF-HH price spread



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

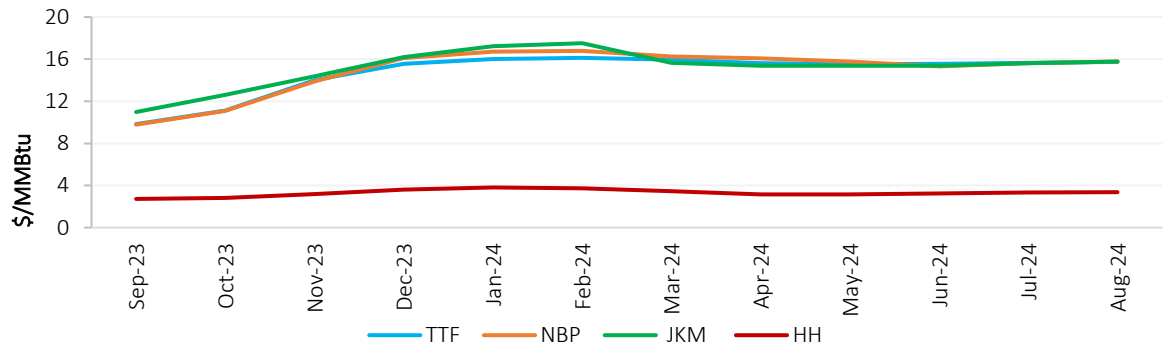
7.1.4 Gas & LNG Futures Prices

The JKM-TTF futures price spread for the remainder of 2023 is positive, indicating that Asian LNG prices may maintain a small premium over European spot prices in the coming months, presenting potential arbitrage opportunities. In September 2023, JKM is expected to trade at an average premium of $1.1/MMBtu compared to TTF. Subsequently, in October 2023, the JKM-TTF spread is expected to widen to $1.5/MMBtu, after which it is expected to narrow, with an average of $0.5/MMBtu. However, in January and February 2024, the spread is projected to widen again to around $1.3/MMBtu (Figure 120).

Regarding the disparity between the TTF and NBP spot prices, NBP is expected to persistently trade at a small discount to TTF of -$0.1/MMBtu, over the next three months. In December 2023, the spread is expected to turn slightly positive, with NBP potentially gaining a slight premium of around $0.5/MMBtu.

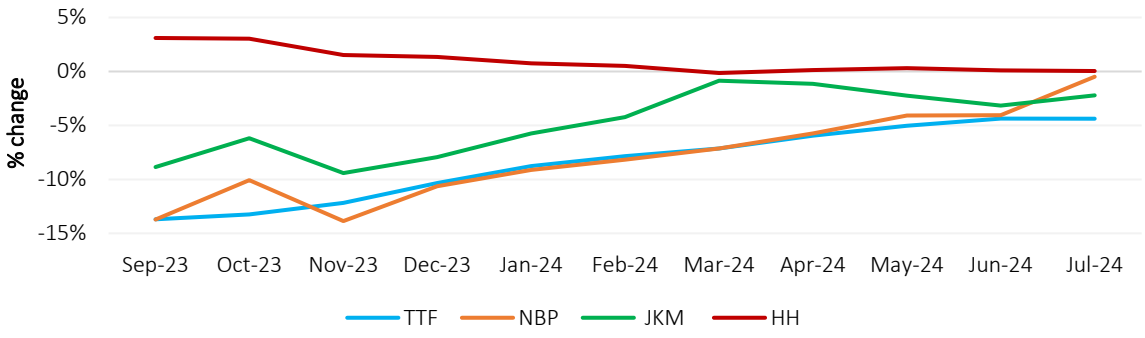
For the 6-month period from September 2023 to February 2024, gas and LNG futures prices for TTF, NBP and JKM (as of August 8, 2023) were all lower than the futures prices expectations considered on July 6, 2023 (as reported in the GECF MGMR July 2023). Moreover, as of August 8, 2023, the average futures prices for TTF, NBP and JKM during the same 6-month period were $13.78/MMBtu, $14.06/MMBtu and $14.82/MMBtu, respectively. Meanwhile, the average HH futures price was $3.31/MMBtu, which was higher than previous expectations (Figure 121).

Figure 120: Gas & LNG futures prices



Source: GECF Secretariat based on data from Refinitiv Eikon
Note: Futures prices as of August 8, 2023.

Figure 121: Variation in gas & LNG futures prices



Source: GECF Secretariat based on data from Refinitiv Eikon
Note: Comparison with the futures prices as of July 6, 2023, as reported in GECF MGMR July 2023.

7.2 Cross Commodity Prices

7.2.1 Oil Prices

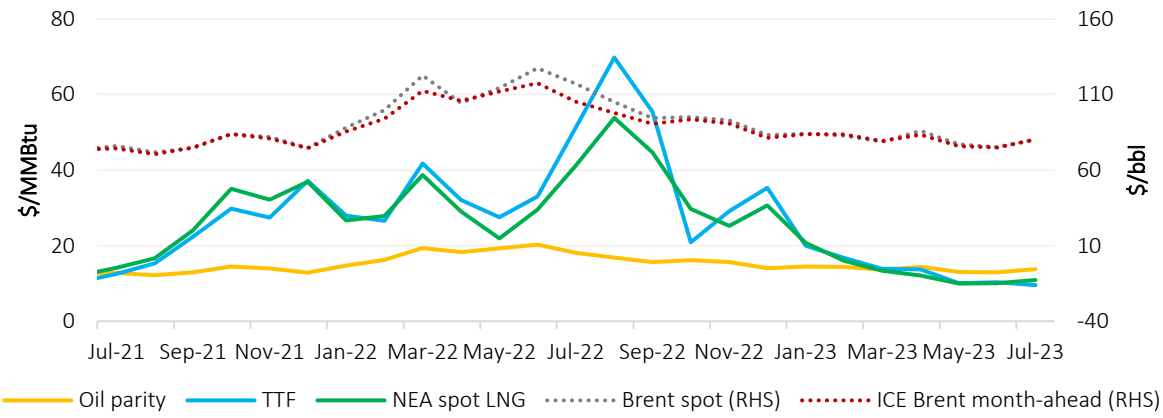
In July 2023, the average Brent spot price was $80.23/bbl, reflecting an increase of 7% m-o-m, but a decrease of 31% y-o-y (Figure 122). The Brent month-ahead price averaged $80.16/bbl, marking a 7% increase m-o-m, and a 24% decrease y-o-y.

Oil prices reached a three-month high in July, after experiencing a steady consecutive decline over the previous five months. Tight supply, because of extended OPEC+ production cuts until August 2023 and a drop in US crude inventories, provided support to oil prices. Additionally, the announcement by the Chinese government to enhance policy support for economic growth in the coming months also contributed to the positive trend. However, despite these factors, concerns about the potential impact of further interest rate hikes on global economic growth and oil demand continued, which ultimately capped further gains in oil prices.

Furthermore, in July 2023, both TTF and NEA LNG spot prices continued to trade at a discount to the oil parity price of $4.3/MMBtu and $2.9/MMBtu, respectively.

From January to July 2023, the average Brent spot price was $80.54/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 122: 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

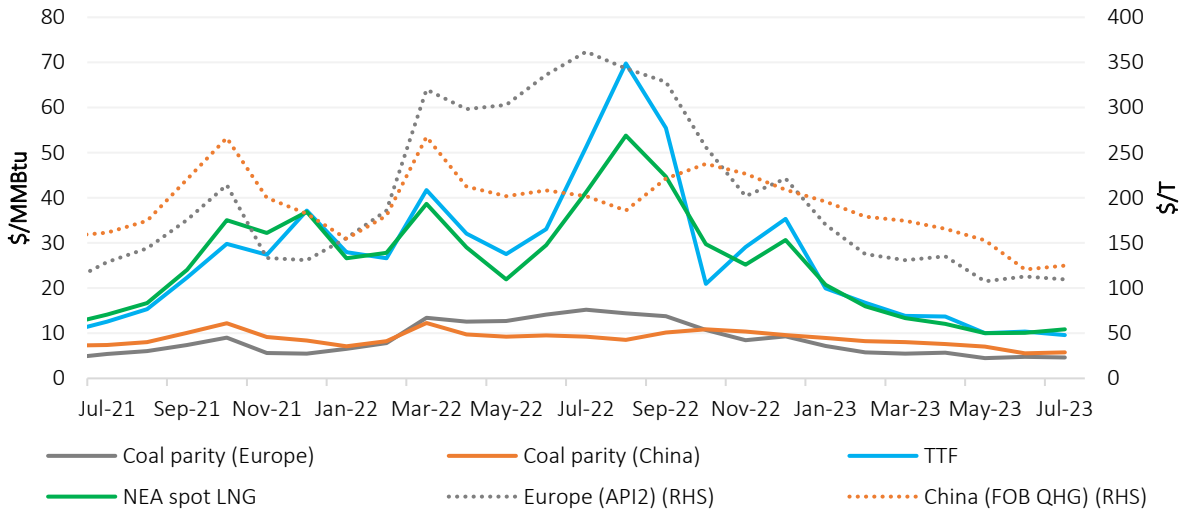
In July 2023, the European coal price (API2) experienced a 3% m-o-m decrease (averaging $109.49/T) and a 70% y-o-y decrease. Meanwhile, in China, the QHG coal price increased by 4% m-o-m, but decreased by 38% y-o-y, averaging $124.95/T, (Figure 123).

European coal prices tracked losses in TTF gas prices during the month. Moreover, prices were weighed down by healthy coal stock levels, which resulted from reduced coal consumption in the region.

The premium of TTF spot price over the API2 parity price decreased by 11% m-o-m to $5.0/MMBtu in July 2023. Additionally, the premium of NEA spot LNG price over the QHG parity price increased by 13% m-o-m to $5.2/MMBtu.

From January to July 2023, the European API2 averaged $129.13/T, representing a 54% decrease y-o-y. Meanwhile, the Chinese QHG price averaged $159.07/T, which was 22% lower y-o-y.

Figure 123: 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.

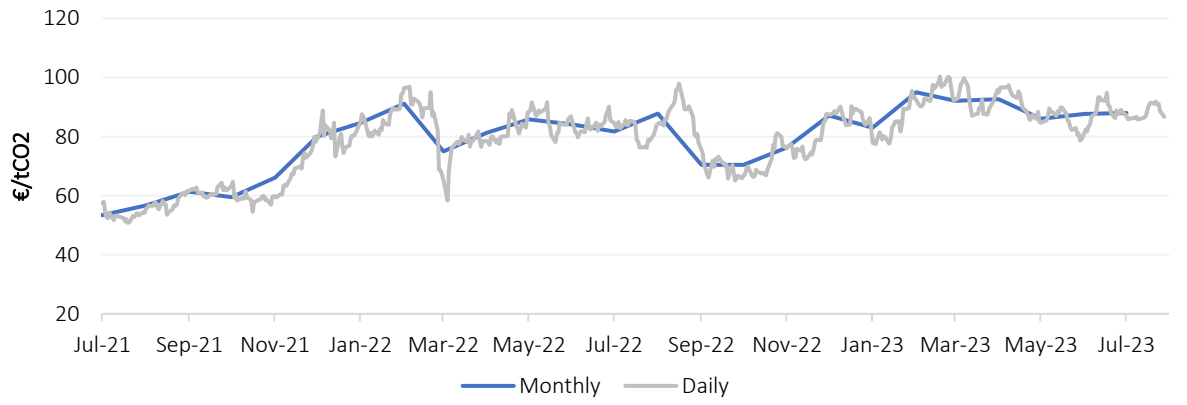
7.2.3 Carbon Prices

In July 2023, EU carbon prices averaged €88.02/tCO_2, remaining relatively stable compared to the previous month, but 8% higher compared to the same period last year (Figure 124).

EU carbon prices were influenced by a neutral to bearish market sentiment. The impact of weaker TTF gas prices and an anticipated rise in renewable energy output was counterbalanced by increased demand for cooling attributed to above-normal temperatures.

From January to July 2023, EU carbon prices averaged €89.22/tCO_2, representing a 7% increase y-o-y.

Figure 124: EU carbon prices



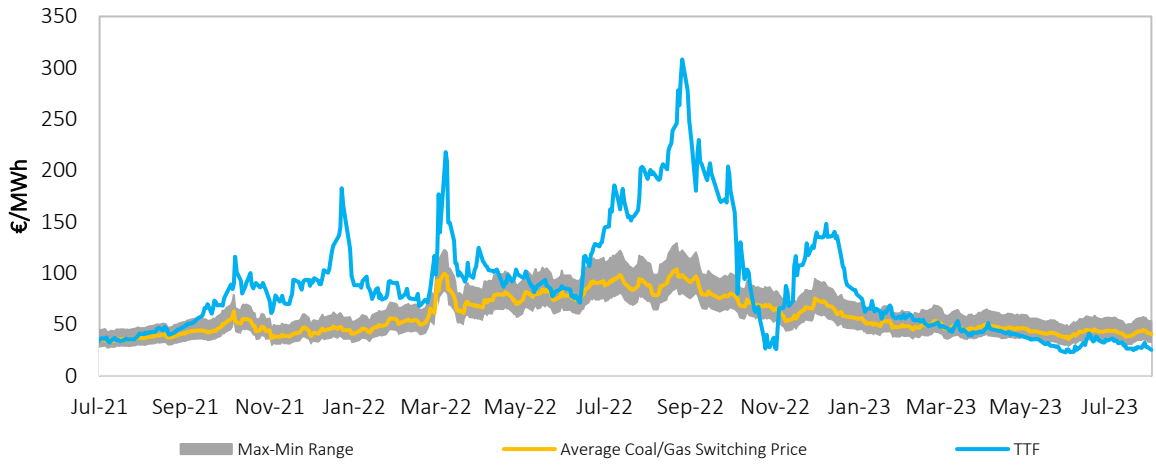
Source: GECF Secretariat based on data from Refinitiv Eikon

7.2.4 Fuel Switching

In July 2023, daily TTF spot prices remained below the range suitable for coal-to-gas switching, with an average coal-to-gas switching price of €41.87/MWh, marking a 2% m-o-m decrease. The average monthly spread between the TTF spot price and the coal-to-gas switching price remained negative and widened to approximately -€12/MWh (Figure 125).

Looking ahead to September 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 125: 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, CO2 emissions prices, operation costs and power plant efficiencies. The efficiencies considered for gas plants are max: 56%, min: 46%, avg: 49.13%. The efficiencies considered for coal plants are max: 40%, min: 34%, avg: 36%.

7.3 Other Developments

European Union: The European Parliament agreed on the broad terms of the EU's electricity market reforms on July 6, 2023. The reforms, which were proposed by the European Commission in March, aim to stabilise power prices to prevent a recurrence of last year's energy crisis. However, EU energy ministers are not aligned on certain elements of the reforms, including the issue of subsidies for existing power plants. Spain, which holds the rotating presidency of the EU Council, drafted a proposal during a meeting held on July 11-12, 2023, in Valladolid, Spain. The proposal suggested allowing the subsidies for existing plants, but with some conditions including the extension of the plant's lifetime by at least 10 years and a substantial increase in its capacity. The EU Parliament is expected to vote on the final reform in September 2023.

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_2	Carbon dioxide
CO_{2e}	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
G7	Group of Seven

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

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

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GECF

Gas Exporting Countries Forum (GECF)
GECF Headquarters
P.O.Box 23753, Tornado Tower
47th & 48th Floors, West Bay, Doha

www.gecf.org

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