Winter 2023/2024 Natural Gas Market Outlook

Executive Summary

Prepared for Natural Gas Supply Association

September 2023

Author

Rob DiDona

ENERGY VENTURES ANALYSIS

8045 Leesburg Pike, Suite 200

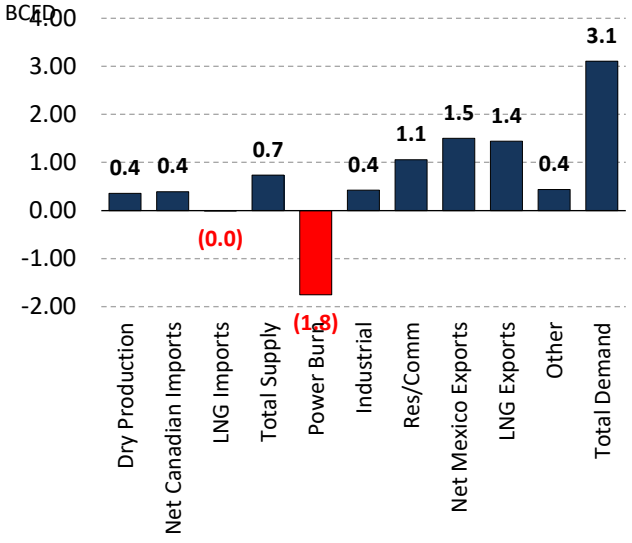
Vienna, VA 22182

(703) 276 8900

www.evainc.com

This winter, associated gas production continues to drive supply growth while total demand expected higher due to stronger net exports and weather

Natural Gas Supply and Demand, 2023-2024 Winter vs 2022-2023 Winter

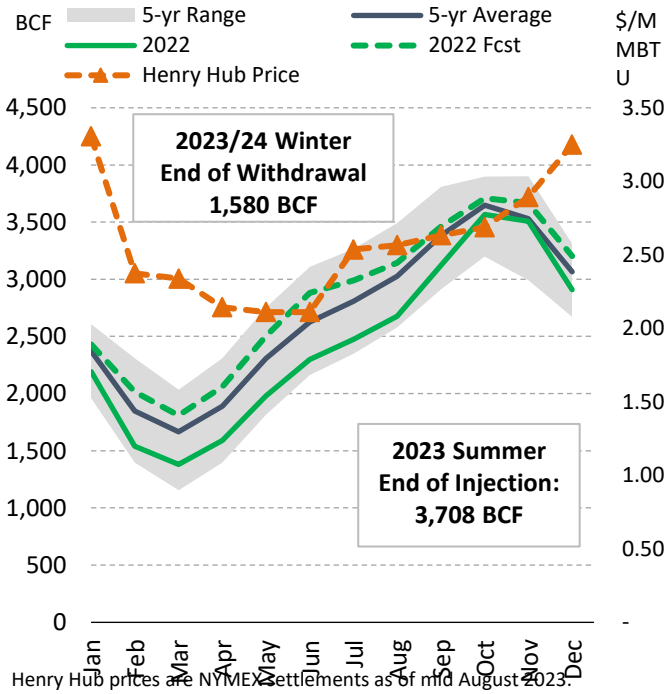


Source: Energy Ventures Analysis

- **On the supply side**, U.S. natural gas dry gas production has remained relatively steady since late 2022. The current storage overhang is a result of strong production growth combined with a mild Q1 2023 winter. This combination produced lower natural gas prices and eventually, a slowdown in producer activity during Summer 2023, as indicated by reduced rig counts, lower frac crew counts, and the flattening of the inventory of Drilled Uncompleted (DUC) wells. EVA expects total winter-over-winter supply to grow by just 0.7 BCFD.
- **On the demand side**, U.S. natural gas demand is expected to rise by over 3 BCFD. Some of the gain in demand is driven by weather-related gains from the residential/commercial (RES/COMM) sector, based on an outlook for normal weather, but the bigger portion of increased demand is driven by much higher net exports. However, power burns are forecast to average nearly 2 BCFD lower this winter, as coal-fired generation is expected to regain market share due to changes in natural gas and coal prices.
- **Net exports** are on the rise because of increased demand from Mexico and improved infrastructure, along with a rise in LNG feedgas demand largely because of the return of the Freeport LNG facility.

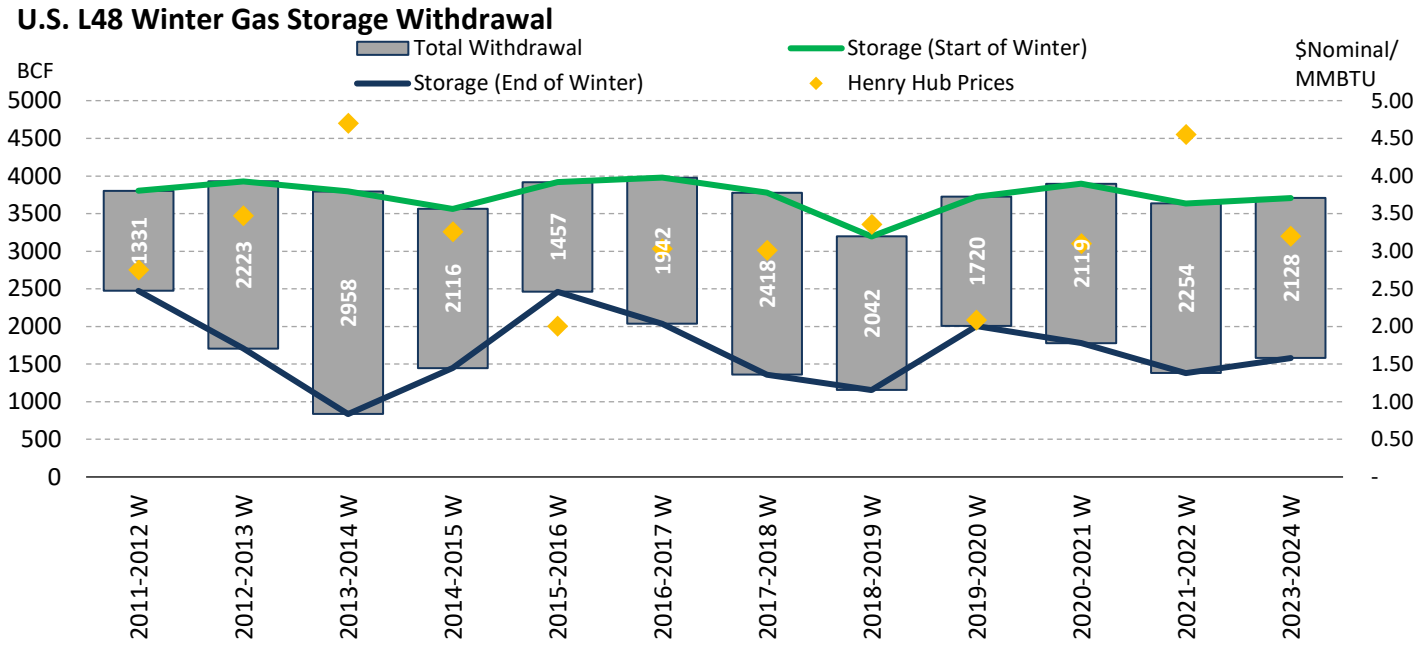
Winter Natural Gas Supply and Demand Summary	2023-2024 Winter	2022-2023 Winter	Difference vs Last Winter	Difference vs Last Three Winters
Supply (BCFD)				
Dry Production	101.7	101.3	0.4	5.5
Net Canadian Imports	5.7	5.3	0.4	0.2
LNG Imports	0.1	0.1	(0.0)	(0.0)
Total Supply	107.4	106.7	0.7	5.7
Demand (BCFD)				
Power Burn	29.1	30.9	(1.8)	0.4
Industrial	24.9	24.5	0.4	0.3
Res/Comm	38.3	37.3	1.1	0.8
Net Mexico Exports	6.9	5.4	1.5	1.4
LNG Exports	13.4	11.9	1.4	1.9
Other	8.8	8.3	0.4	1.0
Total Demand	121.4	118.3	3.1	5.9
Average Withdrawal (BCFD)	-14.0	-11.6	(2.4)	(0.2)
Total Withdrawal (BCF)	-2,116	-1,757	(359.0)	(33.4)
HDDs	3,465	3,359	106.0	103.7

U.S. working gas in underground storage



Henry Hub prices are NYMEX settlements as of mid August 2023.
Source: EIA, Energy Ventures Analysis

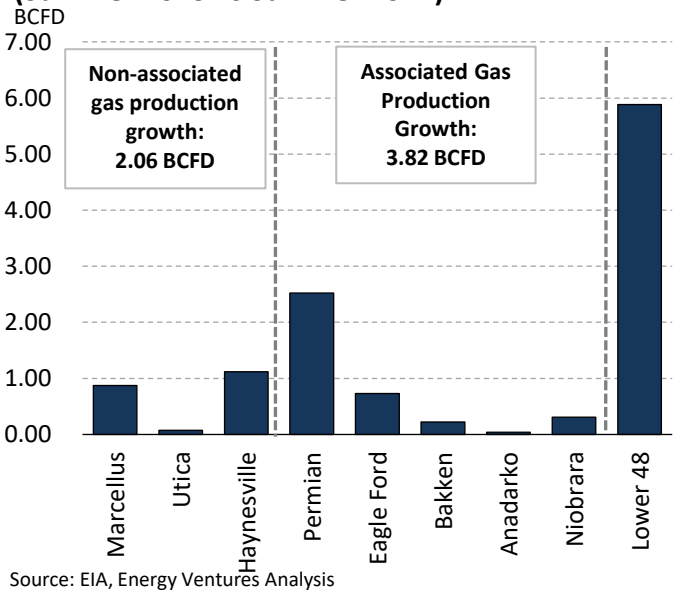
U.S. natural gas storage surplus to the 5-year average expected to dissipate gradually by early December



- U.S. natural gas storage finished the winter heating season (ending March 31, 2023) with a storage overhang that contributed to much lower prices this summer compared to last summer, as well as reduced producer activity.
- That low natural gas price curve during the summer injection season subsequently resulted in very strong weather-adjusted power burns of natural gas compared to last summer due to coal-to-gas switching.
- As Summer 2023 progressed, coal-fired generation retirements and a warmer-than-normal Q3 drove electric demand even higher and cemented the potential for record power burns of natural gas in 2023.
- Meanwhile, Mexican exports and LNG feedgas demand were much higher YoY and have contributed significantly to demand gains.
- The lack of production growth during the Summer 2023 injection season, in addition to demand gains from power burn and exports, have been slowly consuming the storage overhang. EVA projects the storage overhang will gradually dissipate by early December.
- Looking forward, power burns should continue to adjust strong on a YoY weather-adjusted basis for the remainder of the 2023 injection season. In fact, it wouldn't be a surprise to see power burns remain strong through year-end due to gas-fired generation's cost competitive advantage over coal-fired generators. However, EVA estimates that seasonal price gains in natural gas will limit power burn upside, based on mid-September 2023 market forwards.
- Freeport LNG did provide a lift to injection season demand after returning from outage earlier this year and was a primary driver in consuming the storage overhang.
- Total LNG feedgas demand is averaging just north of 13 BCFD for early September despite headlines of low 90% full European natural gas inventories. U.S. LNG exports should remain steady throughout the winter heating season, fortified by netbacks for U.S. LNG rising towards $10/MMBTU.
- As of early September 2023, EVA projects U.S. working gas inventory will end near 3.7 TCF by the end of October 2023, assuming no major surprises or shifts in weather from 10-yr normal levels.

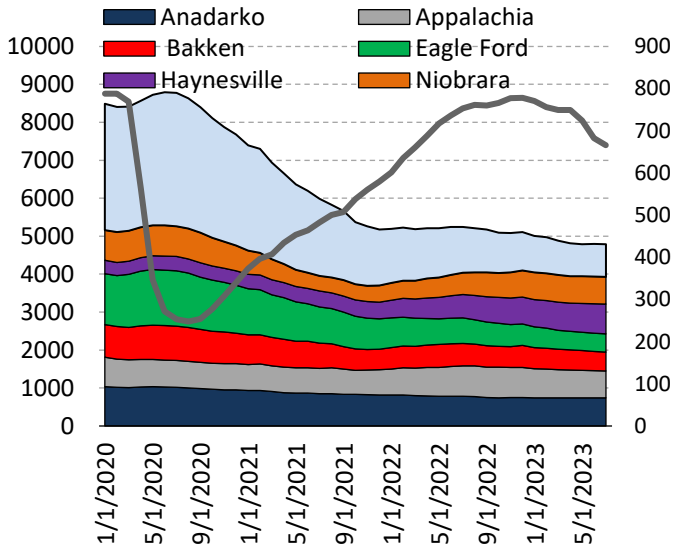
Winter 2023/2024 signals little change in winter production, after big gains in production in Summer 2023

Year-over-Year Production Change by Basin (Summer 2023 vs Summer 2022)



Source: EIA, Energy Ventures Analysis

Drilling but uncompleted wells inventory in major U.S. producing areas

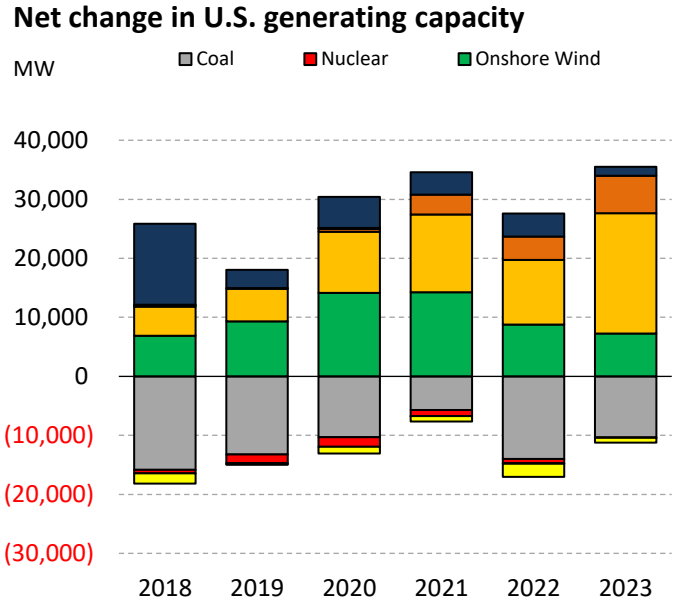


- Summer 2023's production gains have all been actualized. U.S. supply has remained relatively steady after robust growth in U.S. natural gas production during 2H 2022. On a YoY basis, when comparing Summer 2023 injection season supply to 2022 levels, there were gains from gas-directed activity from the Marcellus and Haynesville. However, the real growth came from associated gas supply, primarily from the Permian.
- Looking forward to Winter 2023/2024, EVA estimates that production will continue to hold steady. Drilled-but-uncompleted (DUC) well inventories have stabilized, gas-directed rig counts and frac crews are falling and producer Q3 guidance reports aren't signaling growth.
- EVA expects U.S. dry gas output to average 101.7 BCFD for Winter 2023/2024, which would be measured as nearly flat on a YoY basis.

- Unlike the first half of 2023, DUC inventories have stopped falling, which indicates a slowdown in producer activity. In EVA's opinion, producers are unlikely to grow production at the current forward curve level for the short-term, especially given the much lower production basin differentials.
- Developers of the 2-BCFD Mountain Valley Pipeline (MVP) are indicating the commercial online date Is set for the end of 2023, despite ongoing protests and legal challenges.
- EVA assumes no new major pipeline projects will move forward, apart from infrastructure needed to support Gulf Coast LNG expansion.

Winter natural gas-fired generation will find increased competition from coal-fired generation due to seasonal gas price influences

Source: EVA



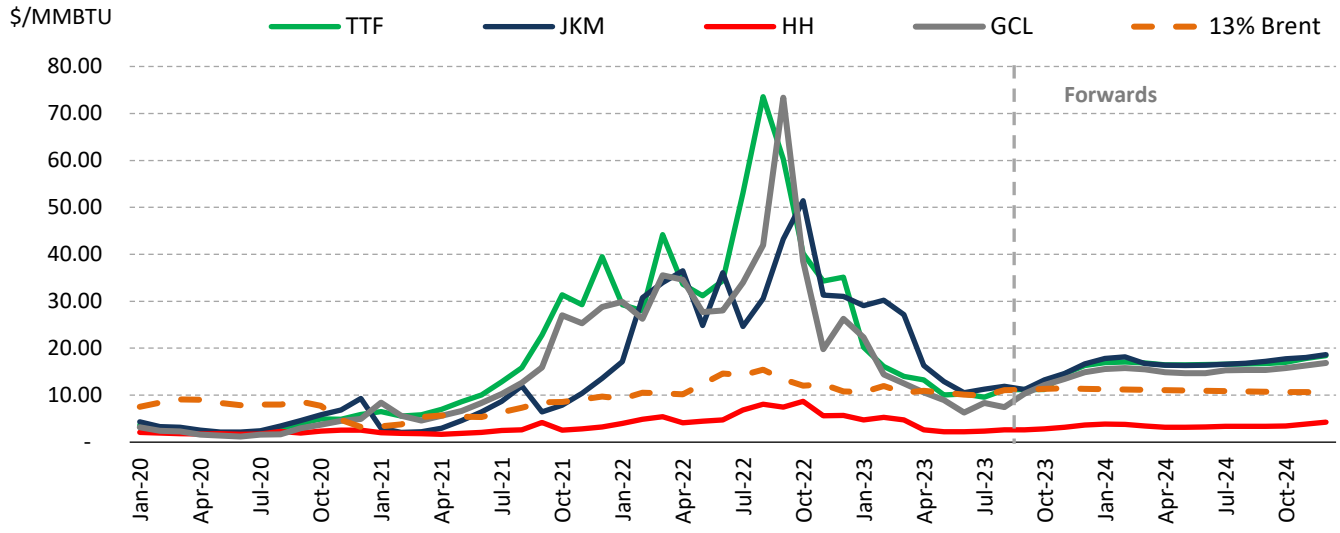
Source: Energy Ventures Analysis, U.S. EIA

- Power burns during YTD Summer 2023 (April 23 – 1H September 23) have averaged nearly 3 BCFD strong on a YoY weather-adjusted basis. Coal generation struggled to take market share during a hot Q3 2023.
- While coal generation has risen as seasonal demand increased, fuel economics still favor gas-fired generation, largely due to healthy spark spreads (difference between power and natural gas prices) and less favorable dark spreads (difference between power and coal prices).
- Comparing this summer to a baseline of 2015, EVA projects a gain of 8.6 BCFD of long-term structural demand growth from new gas-fired generation.
- Despite the structural demand gains, EVA estimates about 3 BCFD less temporary economic switching from coal to gas as coal spot and forward prices are much lower than where the winter 22/23 strip was trading during this time last year.

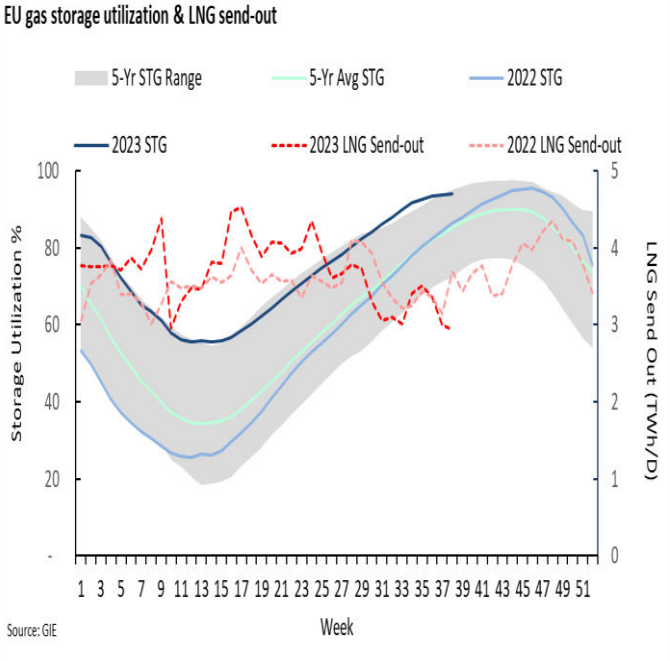
- Ongoing coal generation retirements will continue to limit switching capacity. EVA estimates that over 10 GW of coal-fired generation will be retired in 2023.
- Over 27 GW of new wind, solar, and battery storage resources are expected to be installed by year end. This estimate is lower than the Summer 2023 forecast due to a slower installation schedule as developers manage cost and supply constraints.
- Some renewable developers are paying lofty penalties to walk away from projects, which in addition to the coal retirements, will ultimately support greater utilization of gas-fired generation this year.

European natural gas storage is well ahead of 2023 goals, but there should be little change to U.S. LNG exports given netbacks

Global LNG price

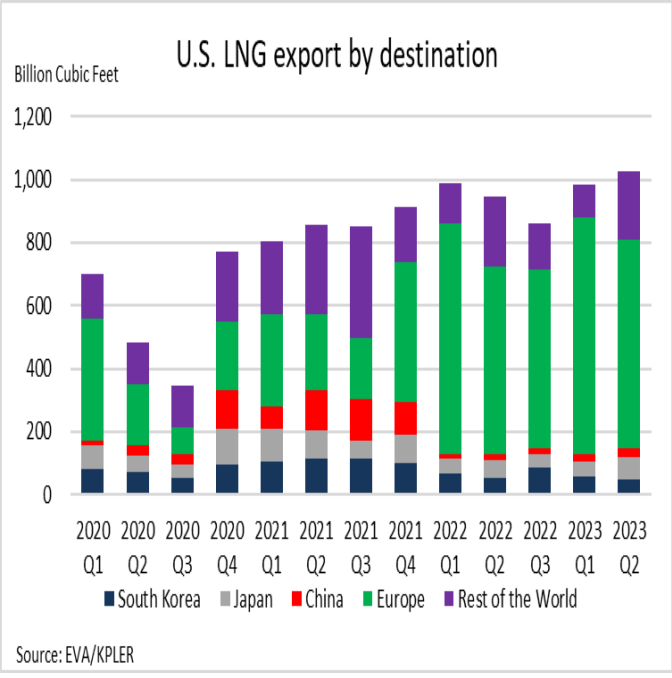


Source: ICE. Future curves are based on April 18 settlements

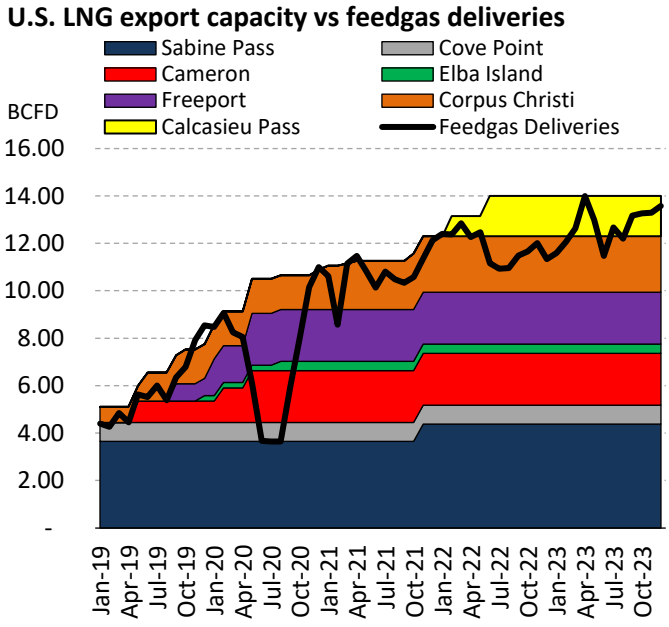


- Despite the loss of the Nord Stream pipeline, European countries have managed to conserve and inject natural gas throughout Summer 2023 and, as of writing this report, total natural gas inventory in Europe sits in the low 90% full range, well ahead of regional plans.
- Price competition between Europe and Asia has been muted as compared to last year. However, for the majority of the Summer 2023 injection season, given low demand and high storage in Europe, Asian buyers of U.S. LNG have capitalized on the available supply as netbacks to Asia have averaged higher than those to Europe.
- Supply disruption will weigh heavily on prices. The Australia LNG worker strike didn't cause supply, disruption but served as a warning to the global gas market that supply disruptions (especially those ahead of the winter heating season) will overshadow robust storage levels.
- Looking forward, U.S. LNG should remain highly utilized based on the forecasted netbacks to both Europe and Asia.

Europe remains the main buyer of U.S. LNG, but Asian buyers are watching Australian strike news which could accelerate price competition



Source: EVA/KPLER

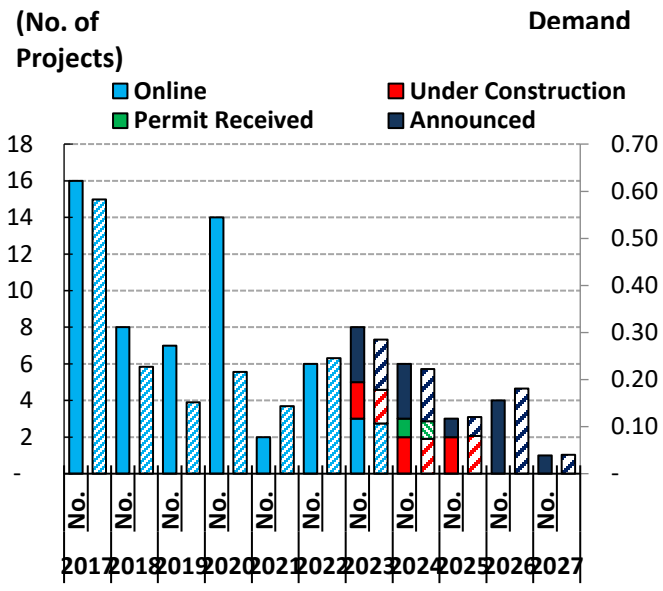


Source: Energy Ventures Analysis, EIA

- European bid interest for U.S. LNG is expected to remain strong for the remainder of 2023 and throughout the 2023/2024 Winter season. European gas forwards have been falling throughout 2023 after a volatile 2022 as total European gas storage has been well above the 5-yr average nearly all year. However, despite the price decline, netbacks remain healthy and are trading near parity with Asian gas netbacks.
- All seven U.S. exporting plants were operating at/above nameplate capacity during most of Summer 2023, aside from some low offtake days, usually due to routine and seasonal maintenance.
- Based on the current forward market settlements, EVA expects estimated netbacks of U.S. LNG exports to NW Europe and NE Asia to average north of $7/MMBTU for the remainder of 2023.
- Asian and European gas benchmarks will continue to balance each other, especially true in the event of a supply disruption during the winter heating season.
- EVA expects U.S. LNG feedgas demand to average 13.4 BCFD during Winter 2023/2024, an increase of 1.5 BCFD as compared to last winter, primarily due to the return of Freeport LNG.
- As highlighted, several U.S. LNG projects are expected to advance over the next few years. The United States continues to be one of the top global LNG suppliers. U.S. LNG will be incredibly important to both European and Asian buyers as we progress through the winter heating season. Additionally, U.S. LNG will remain a key supply source for global gas-fired power plant development.
- Natural gas is and will remain a key component of global energy supply as nations develop renewable resource infrastructure. Beyond the development phase, natural gas will play an important role as a swing resource due to the intermittent nature of renewable generation.

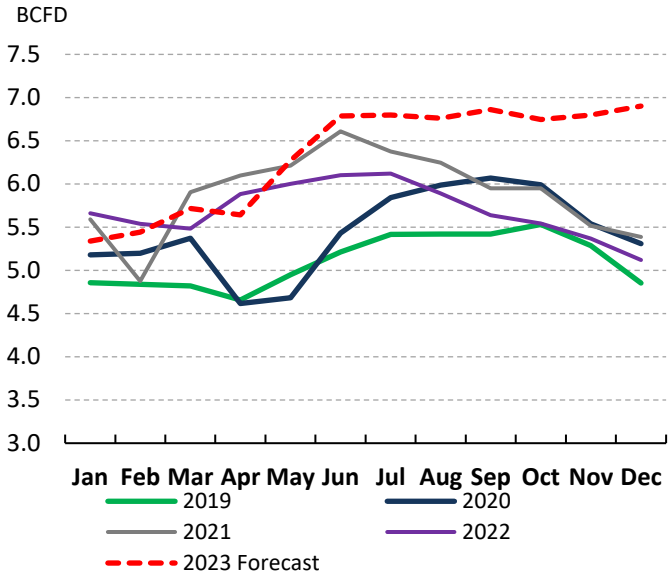
Structural growth is on the horizon for both industrial end-users and for piped gas to Mexico

Industrial Projects and Gas Demand



Source: EVA

U.S. Exports to Mexico



Source: EVA

- According to the U.S. Federal Reserve, the industrial capacity utilization for the first 7 months of 2023 averaged 79.4%, which is near 1% lower YoY. Economic factors are still at play, global inflation concerns are impacting demand, especially true in Europe where demand conservation efforts are in effect.
- On the other hand, the development of new industrial projects has supported the structural growth of industrial demand. As of September 2023, there are 22 projects expected to come online from 2023-2027, with total gas demand of 0.85 BCFD and total investment of $29.8 billion.

- Piped natural gas imports from the U.S. continue to play a critical role in the development of Mexico's energy sector. New single day record flows were observed of 7.5 BCF for several days during July and August 2023. Exports to Mexico are expected to average near 6.9 BCFD for Winter 2023/2024, which is nearly 1.5 BCFD higher YoY.
- U.S. natural gas exports are expected to grow in 2024 on the completion of new pipelines in Mexico. Mexican gas demand remains supported by LNG project development, industrial demand and gas-fired generation.