Gas to Power Journal
Peakload Power and Energy Storage

Focus on LNG-to-power projects, H2 co-firing

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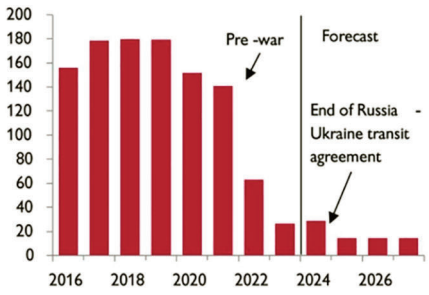
Arbitration awards risks Russian gas flows to end before year-end

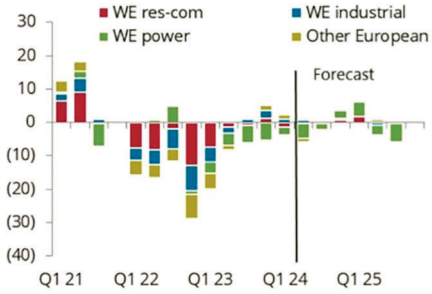
Energy Aspects warns there is uncertainty over the continuation of Russian pipeline gas supply to Europe due to a potential seizure of payments to Gazprom under an arbitration award. Russian supply via Ukraine will be lost in January 2025 anyway with the expiry of the Russia–Ukraine transit agreement, adding bullish sentiment to the Cal-25 gas contract.

Russian gross gas flows to Europe, bcm



Source: Argus Media Group, ENTSOG, GTSOU, Energy Aspects

European gas demand y/y, bcm



Note: Western Europe (WE) comprises Belgium, Germany, France, the Netherlands, the UK, Spain and Italy
Source: Bloomberg, system operators, ENTSOG, DESNZ,

Residual Russian pipeline flows to Europe of around 1.3 billion cubic metres per month (bcm/m) through Ukraine and another 1.3 bcm/m through TurkStream are at risk of halting if arbitration proceedings allow for the seizure of payments to Gazprom, analysts warn. In the event of a full halt to Russian pipeline deliveries over the second half of 2024, prices at the Dutch TTF would rise to around €44/MWh over balance-of-summer and October to significantly reduce gas-burn for power generation and free up some volumes to meet Europe's storage targets.

Uncertainty about TTF forward prices abounds, though balance-of-summer contracts still trade close to Energy Aspect's forecast amid high stocks. Asia has, however, been pulling LNG away from Europe over recent months which could moderate in the third quarter.

"The TTF near curve does not appear to be pricing in much risk of the loss of Russian supply, given how far it is below where it would need to price to counter the loss of that supply," analysts commented. "But there is still a lot of uncertainty over the continuation of those flows," they added, pointing at "little clarity over which arbitration proceeding triggered the court communication to Austria's OMV that its payments to Gazprom could be considered an asset for seizure."

continued on page 2

NFE pushes back date for first cargo at FLNG plant off Altamira to July

New Fortress Energy (NFE) has postponed the date for first LNG at its floating liquefaction plant offshore Altamira in the Gulf of Mexico. Despite having completed pre-commissioning activities, NFE said the first cargo will now be shipped in July rather than June with some volumes expected to be shipped to Brazil's Barcarena terminal to fuel gas power stations.

Wes Edens, chairman and CEO of New York-based NFE, had previously said that the first cargo from Altamira FLNG terminal was expected in June.

In the latest filing to Nasdaq stock exchange, NFE underline "tremendous progress" had been made towards start of liquefaction operations. "As of June 14, the work necessary to begin operations is complete and the company has also completed the full remainder of pre-commissioning activities." Still, NFE said it expect to produce LNG in the next 10 days, without giving reasons for the delay of the first cargo.

NFE's Altamira Fast LNG terminal

continued on page 2

AGENDA

Continued from page 1, top story

There is a precedent in arbitration decisions: Uniper launched the arbitration in November 2022 seeking billions of euros for undelivered Russian gas and was awarded damages. Gazprom Austria was meant to pay these damages but the firm filed for bankruptcy in April last year.

Ban on Russian LNG deemed unlikely

Faced with the risk of losing Russian pipeline gas supplies following an arbitration award to OMV, analysts see it unlikely that Europe will cut off Russian LNG supply as part of the 14th sanction package. EU trade commissioner Vladis Dombrovskis had vowed in late May "the 14th package should be adopted in the spring."

The EU's LNG imports from Russia amounted to 1.93 million tons from the Yamal liquefaction terminal in the Arctic and the Portovaya terminal in the Baltic in March and April this year. This is a significant growth of 0.42 million tons, or 28%, when compared to the 1.51 million tons imported in March 2023, data from our sister publication LNG Journal shows.

Banning Russian LNG imports has been considered as Europe's long-term contracted volumes will soon exceed supply need and could leave the bloc over-contracted as early as 2027, the EU agency of energy regulators (ACER) finds. Projections are based on the REPowerEU plan, aimed at reducing dependence on Russian gas by prioritising green energy which would cut demand by an additional 100 bcm by 2030.

"From 2023 and until 2026, the existing long-term contracts of about 49 billion cubic metres for delivery in Europe are assessed as insufficient to meet the total EU LNG demand. However, from 2027 to 2030, the impact of REPowerEU measures on EU gas demand reductions is expected to result in over-contracted LNG position, with surplus volumes ranging from 30 bcm in 2027 to 66 bcm in 2030," ACER's latest report reads. ■

Gas price crash drives down UK power prices by 20% through 2028

Baseload electricity prices in the UK are projected to fall 20% to £19/MWh over the next four years due to low natural gas and carbon prices. Gas prices could fall 22% to around 69.7 p/th until 2027 amid sluggish demand and high levels of gas storage across Europe, while UK carbon prices at £65.8/tCO2 trade at a significant discount to EU Allowances.

Despite these short-term trends, Oxford-based Aurora Energy Research reckons the price impact beyond 2028 will be "minimal". The current bearish forecast is heavily influenced by the latest drop in gas and carbon futures, triggered by healthy gas deliveries, strong storage levels and an oversupply of UK Emission Trading Scheme allowances.

Yet, the delay at Britain's huge nuclear plant Hinkley Point C put upward pressure on electricity prices as the project's capital costs rise beyond earlier expectations.

Flexible power supply can earn operators a lot of money: Cashflows from reciprocating gas engines are projected to rise by 42% to £95/kW per year between 2024 and 2030, driven by higher capacity market prices. As for battery storage, another source of flexible power, cashflows are likely to fall by 2% to £91/kW per year in the same period, due to lower short-term gas prices and higher skip rates in the balancing mechanism.

Margins are projected to decline by 3% from 2031 to 2040, and by 1% through to 2030.

"Battery storage assets have achieved reduced margins over the last 18 months, as frequency response markets have saturated, and the Balancing Mechanism has not been able to properly utilise their flexibility. Meanwhile, gas peaking engines have seen worse energy trading performance but continue to be rewarded through the Capacity Market for their cost-effective contributions to security of supply," explained Aurora's senior associate Will Stephenson.

Reform to the Balancing Mechanism remains a key uncertainty over the coming years, he warned, as National Grid ESO is taking iterative steps to improve their systems. ■

Gas to Power Journal

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Continued from page 1

Having received the thumbs up from the US Customs and Border Protection agency, LNG produced at Altamira can be transported on non-US Jones Act qualified vessels. As a result of this ruling, NFE can sell and deliver LNG produced at its FLNG facility offshore Mexico to US locations, including the territory of Puerto Rico.

Progress on Altamira coincides with advances on NFE's LNG import and power generation projects in Brazil. Construction just started for NFE's 1.6 GW power plant adjacent to the Barcarena LNG terminal in Brazil. A consortium of Mitsubishi Power Americas and Andrade Gutierrez is carrying out EPC for the plant, targeted to start operation no later than August 2026 by when it is meant to generate electricity under a 15-year capacity reserve contract.

In the first quarter of this year, NFE completed construction and commissioning of both the Barcarena and Santa Catarina terminals. Along with the existing 630 MW power plant and 25-year agreement, the Barcarena LNG terminal is now supplying regasified LNG to more than 2,200 MWs of power capacity owned by NFE, as well as to Norsk Hydro's Alunorte alumina refinery. ■

Tokyo Gas to deliver LNG cargo to First Gen's Batangas FSRU

Philippine utility First Gen has contracted Tokyo Gas to supply one LNG cargo of about 125,000 cubic meters in July to be unloaded at the BW Batangas floating storage and regas unit. The FSRU is berthed at the First Gen Clean Energy Complex and the delivered gas is designated to fuel nearby gas-fired power stations.

In a stock exchange filing, First Gen confirmed it closed a tender for a cargo by awarding a contract to Tokyo Gas. Similar contracts were signed earlier with Shell Eastern LNG, Trafigura, TotalEnergies Gas and Power Asia and CNOOC Gas and Power Trading. The latter supplied a cargo with 130,000 cbm of LNG in late April, also to fuel the First Gen Clean Energy Complex.

The LNG to be delivered by Tokyo Gas is designated for power generation. In the coastal city of Batangas, just south of Manila, First Gen operates a Clean Energy Complex which comprises for the 1,000 MW combined-cycle Santa Rita gas power plant, the 97 MW open-cycle Avion gas power plant and the 420 MW combined-cycle San Gabriel power plant.

Apart from the Clean Energy Complex, the utility operates three further similar plant, with 2,107 MW combined. First Gen also said it remains committed to develop the 1,200 MW Santa Maria combined-cycle gas power plant in Batangas to supply baseload and mid-merit power to the Luzon grid. The Sta. Maria CCGT was initially meant to enter operations by the end of this year or early 2025, but the timeline slipped and First Gen stopped short of disclosing an update.

For many years, First Gen's gas-fired power plants had been fuelled by gas from the Malampaya field which is now depleting. LNG will hence be vital to boost the share of gas in the Philippine's power gen mix to 26% by 2040.

View of BW Batangas regas terminal and adjacent power station

Rival LNG import ventures

The Batangas FSRU is the Philippines' second LNG import node. In April last year, the PHLNG facility entered the market as its FSU Ish arrived laden from the Das Island plant in the UAE. Atlantic Gulf and Pacific's (AG&P) has developed the PHLNG terminal, with an initial capacity of up to 3 mtpa, to source fuel for Ilijan power station (1200 MW), replacing domestic supply from the Malampaya field.

The Government of the Philippines had been accelerating the approval process for LNG import terminals to avoid a spike in electricity prices and power shortages, once Malampaya reserves will be depleted in late 2024.

Currently, the he Malampaya gas and condensate field still provides enough fuel to cover 30% of the electricity needs of the Luzon Island including the capital Manila but LNG is gaining importance. The Philippines imported 0.57 million tons last year, according to LNG Journal data, and have become a fast-growing LNG market in Southeast Asia. ■

PetroChina ships LNG cargo to Vietnam to fuel power stations

PetroVietnam Gas has received another LNG cargo delivered by PetroChina to the Thi Vai regasification terminal. The shipment came from Brunai's liquefaction terminal in Lumut and will be used to fuel gas-fired power stations in Vietnam as utilities prepare to meet peak electricity demand this summer.

The shipment is already the fourth for the Thi Vai LNG terminal this year, which currently has a capacity of 1 mtpa but is planned to be expanded to 3 mtpa in the next stage.

Prior to the latest cargo, PetroVietnam got a shipment last month from TotalEnergies loaded at Pertamina's Botang LNG terminal. The Vietnamese state gas importer also received some 60,000 tons of LNG from PetroChina on April 29 and about 70,000 tons of LNG from QatarEnergy on April 11.

Tendering for cargoes

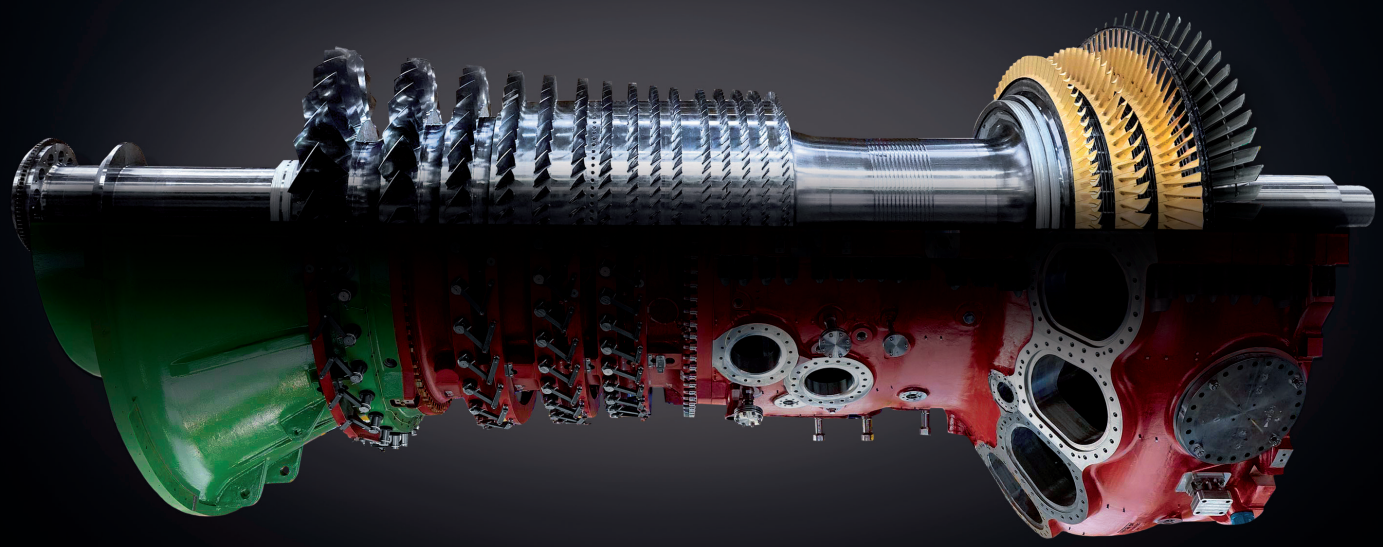
Eager to source more natural gas, PetroVietnam had tendered for LNG cargoes to be delivered to the Thi Vai import terminal in May and early June. Most of the volume had been designated for power generation as a brutal heatwave pushed up electricity demand for cooling.

Sweltering heat of up to 44 degrees Celsius in May caused an intense drought in Vietnam that threatens the livelihood of farmers and fishermen, and jeopardises the health of people having to work outside. Demand for air-conditioning is at record highs, fuelling gas demand for power generation, which in turn necessitates additional LNG imports.

To help boost electricity supply, PetroVietnam Gas signed a contract with EVN to supplement input for power generation, with LNG to be distributed to the 733 MW Phu My 3 combined-cycle gas power plant, with a view to adding some 500 million kWh to the grid. ■

ITALIAN ENERGY

BRIGHTER FUTURE



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Guangdong subsidises gas power plants to reduce loss on electricity sales

China's southern Guangdong province has launched a subsidy for local gas-fired power generators to help curb losses on electricity sales. The new subsidy allows grid operators adjust payments to gas-fired power plants in line with fluctuations of the natural gas price, allowing them to pass on higher fuel costs to end-consumers.

The policy aims to incentive the development of new gas-fired power gen capacity in Guangdong, one of China's heavily industrialised provinces. The province has 39.55 GW of installed gas-fired capacity. However, many plants have been unwilling to increase production beyond their contracted electricity supply mainly due to losses due to high gas prices. Last year, gas power plants produced just 13% of Guangdong's total electricity needs – despite significantly higher installed capacity – so that electricity from gas ranked behind that from coal and nuclear.

Policymakers and state planners in Guangdong aim for 55 GW gas-fired power capacity by 2025, implying annual growth rates of 17% during 2023 to 2025. However, actual capacity grew only 15 % last year and stayed behind target.

Subsidies used to be paid to Guangdong's operators of gas-fired power plants to help them compete against coal. These subsidies were previously fixed and hence do not mirror changes in feedstock gas prices. Subsidies were paid by the grid operators to power plants and in turn collected from industrial and commercial electricity users. It is normally the difference between the on-grid coal power tariff and the on-grid gas power tariff.

The on-grid gas power tariff in Guangdong is around Yuan 0.655-0.69/kWh, depending on the generating unit, while the benchmark coal power tariff is about Yuan 0.463/kWh, implying subsidy of around Yuan 0.192-0.227/kWh, industry sources told Platts. The on-grid tariff was based on a gas price of around Yuan 2.5-2.9/cu m, which has hovered above Yuan 3/cu m in the past two years leading to more losses in gas-fired power generation.

View of the 5,000 MW Yangxi power plant in Xitou Town, Guangdong

Gas-fired power plants in Guangdong mostly sell electricity under medium- to long-term contracts which are priced around Yuan 0.554/kWh. Analyst noted this implies as revenue of around Yuan 0.746-0.781/kWh after adding subsidy of around Yuan 0.192-0.227/kWh.

However, the cost of power generation is pegged at around Yuan 0.81/kWh including fuel and fixed costs, based on Yuan 3.4/cu m gas price and 3,000 hours utilization. Utilities hence pay a higher cost for generating electricity from gas than what they are getting paid.

The new subsidy is understood to ruse up to Yuan 0.333/kWh and could be adjusted to the actual gas costs, which market observers say should prevent some plant operators from bankruptcy. ■

Mountain Valley Pipeline begins operation, carrying up to 2 Bcf/d

Following stringent regulatory oversight, Mountain Valley Pipeline (MVP) has entered service and is available for interruptible or short-term firm transportation service until long-term capacity obligations commence on July 1. Spanning 303 miles across West Virginia and Virginia, the MVP is designed to carry up to 2 Bcf of gas per day from the Marcellus and Utica Shale to the mid-Atlantic and US Southeast.

Built at a cost of $6.2 million, the interstate interconnector provides cost-effective access to gas for industrial users and power generators in the growing demand markets in the south-eastern part of the United States. The MVP is part of a network of more than 300,000 miles of transmission pipelines the natural gas that fuels the U.S. economy.

"Demand for natural gas in Southwest Virginia continues to grow, and the importance of MVP's energy supply cannot be overstated," said Paul Nester, president and CEO of Roanoke Gas Co. "The MVP and its gas supply are essential to meeting the needs of residents and businesses across the Roanoke Valley, now and for many years to come. Further, MVP's delivery points to Roanoke Gas in Franklin and Montgomery Counties are certain to provide direct, long-term economic benefits to this region."

Before entering service, the Mountain Valley Pipeline had to meet several in-service conditions of the U.S. Pipeline and Hazardous Materials Safety Administration and receive approvals from the Federal Energy Regulatory Commission (FERC). Developers also vowed to buy $150 million in carbon offsets for operational emissions during the first 10 years of service. ■

Keadby-2 wins Guinness World Record for 64.18% efficiency

SSE Thermal's Keadby Unit 2 power station in North Lincolnshire, UK, has achieved two Guinness World Records: The Siemens Energy-built plant was verified to achieve 64.18% combined-cycle efficiency and is also record holder for the most powerful CCGT with 849.45 MW capacity installed and its SGT5-9000 HL turbine can already run on up to 50% hydrogen.

Keadby originally operated as a coal-fired power station between 1952 and 1984 with a capacity of 360 MW. The gas-fired power station Keadby 1 was commissioned in 1996 and Keadby 2 started commercial operation on March 15, 2023, after a construction time of four and a half years.

At the heart of Keadby-2 is a SGT5-9000 HL turbine. Despite its size, the turbine is capable to reach full power in just 30 minutes, enabling flexible response to rising volumes of fluctuating renewable power supply.

Best-in-class efficiency means to turbines makes the best possible use of fuels. According to Siemens Energy, the efficiency of gas turbines in combined-cycle power plants has increased by almost 30% since the beginning of the 1990s. This means nearly 30% less gas is required for the same amount of electricity generated.

Aerial view of SSE's Keadby 2 power station

Works underway on H2 co-firing

Eager to decarbonise, SSE looking to blend hydrogen with natural gas in the combustion process. "We are working with Siemens Energy on plans to blend hydrogen into Keadby 2, which would not only decarbonise the site further but also provide evidence for the potential role of hydrogen in large-scale flexible power generation more widely in the UK," said Catherine Ray, managing director of SSE Thermal. To ensure supply of clean fuel, SSE Thermal is developing Aldbrough Hydrogen Pathfinder in the Humber which would unite hydrogen production, storage and power generation in one location by the middle of this decade.

Plans for the next generation of low-carbon power are already in place: SSE Thermal and Equinor are developing Keadby 3 which would feature a carbon capture unit ensuring that around 95% of emissions don't enter the atmosphere. The project received planning consent in December 2022 and is one of three power CCS projects shortlisted by the UK government in its Cluster Sequencing Process. ■

Ameren proposes 800 MW open-cycle gas plant at brownfield site

Ameren Missouri has applied to the state regulator to build an 800 MW open-cycle gas power plant on the site of the decommissioned coal-fired Meramec Energy Centre. The new Castle Bluff Energy Centre would be dispatched to deliver peakload power on the hottest summer days, the coldest winter night and complement renewable energy added to the grid.

In its latest Integrated Resource Plan (IRP), Ameren envisages investments in gas power, renewables and battery-based energy storage. One key project mentioned in the IRP is the design and construction of an 800 MW gas-fuelled peaking power plant.

Other large projects include the addition of a 1,200 MW combined-cycle gas power plant in 2033, timed to be commissioned shortly after the retirement of the 1,099 MW coal-fired Sioux Energy Center in West Alton, Missouri, in 2032.

Flexible gas power plants will help balance Ameren's planned renewable additions. Some 4,700 MW of new wind and solar power units are envisaged to be built by 2036 at a potential investment of up to $9.5 billion.

Render of Castle Bluff Energy Center

Energy storage – with a 400 MW battery to be added by 2030 and a similar-sized unit by 2035 – will enhance Ameren's flexibility of power supply, as will the 1,200 MW of clean, on-demand generation which is meant to be ready for service in 2040. ■

H2-ready engine power plant on offer in 2025

Finish technology group Wärtsilä has launched the world's first large-scale hydrogen-ready engine power plant, enabling the clean-burning fuel to become an essential part of future power systems. TÜV SÜD has certified the conceptual design of the Wärtsilä 31 engine platform which is available for orders in 2025, and for delivery from 2026.

With renewables build-out set to double by 2030, there will be substantial clean energy available to produce green hydrogen. Yet, creating the fuel through electrolysis alone is not sufficient to decarbonise while guaranteeing stable electricity supply. According to the International Energy Agency (IEA), reaching net zero emissions by 2050 requires 17 million tons of hydrogen use in power generation in 2030, reaching 51 mt by 2050.

Flexible power is vital to balance fluctuating renewable energy supply, yet fast-ramp balancing power plants need to e ready to run on clean-burning fuels like hydrogen or ammonia, Wärtsilä underlined. The manufacturer's latest engine can run on natural gas and 25 vol% hydrogen blends.

The platform, which the hydrogen-ready power plant is based on, synchronises with the grid within 30 seconds from start command, offering unparalleled load following and high part load efficiency. It has completed more than 1 million running hours, with over 1,000 MW installed capacity globally. ■

Render of Wärtsilä's H2-engine power plant

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