



Weekly News

19 April 2024

First Gen to buy LNG from CNOOC to fuel power plants at Batangas

Philippine power producer First Gen has announced it awarded a contract to CNOOC Gas and Power Trading for supply of about 130,000 cubic metres of LNG to fuel the First Gen Clean Energy Complex in Batangas City. The single cargo is scheduled for delivery on an ex-ship basis next month and will be unloaded at the BW Batangas FSRU.

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.

Supply to the new BW Batangas floating LNG storage and regas terminal has been ramped up as First Gen is keen to source gas for adjacent power stations. Apart from the Clean Energy Complex, the utility operates three further similar plants, 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.

Having set aside \$50 million for pre-development works for the power project two years ago, First Gen seems to have spent most of its free cash flow to complete the construction of the BW Batan-



CNOOC Moss-type LNG carrier

gas regasification project. The 162,000-cbm FSRU arrived in June last year but was not commissioned until late November.

Rival LNG import ventures

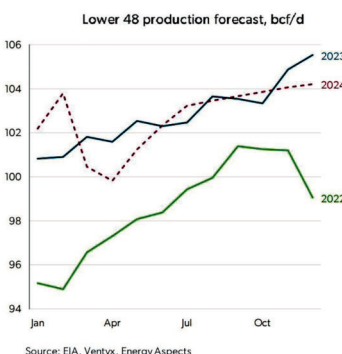
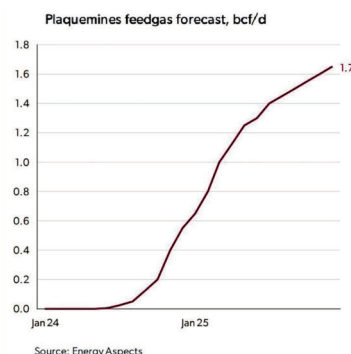
The Batangas FSRU is the Philippines' second LNG import node. In April last year, the PHLNG facility entered the market as its FSU Ish arrived laden from the Das Island plant in the UAE. Atlantic Gulf and Pacific's (AG&P) has developed the PHLNG terminal, with an initial capacity of up to 3 million tons per annum (mtpa), to source

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First gas for Plaquemines LNG in Q2 to boost US domestic demand

With the first of Plaquemines LNG three feeder pipelines, Venice Extension, approved for service, the terminal is ready to begin taking feedgas in the second quarter which will push up overall US demand in addition to the seasonal increase in cooling load. Stretching over three miles, the 1.3 bcf/d pipeline will bring gas from Texas Eastern Transmission (TETCO) to Plaquemines.

A second pipeline, Kinder Morgan's Evangeline Pass Expansion, will link the terminal with the Tennessee Gas pipeline network. Works on two compressor stations are already underway, though construction of the 13.1 miles of new pipeline has yet to begin. Venture Global is also busy building its own pipeline, Gator Express, which is meant to start service and supply 1.9 bcf/d to the liquefaction terminal when its first trains will be commissioned this summer.



With eighteen trains, the Plaquemines terminal will have an initial LNG production capacity of 13.32 mtpa with work on the gas pre-treatment

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fuel for Ilijan power station (1200 MW), replacing domestic supply from the Malam-paya 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 2024. Currently, the Malampaya gas and condensate field still provides enough fuel for three gas-fired power plant with combined capacity of 2,700 MW, enough to

cover 30% of the electricity needs of the Luzon Island including the capital Manila.

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. ■

UAE power mix will be dominated by thermal power through to 2035

The discovery of more onshore hydrocarbon reserves will cement the dominant role of thermal power in the energy mix of the United Arab Emirates (UAE) in the coming decade. According to Global Data, the installed capacity of thermal power in the UAE was around 80.4% last year, with gas-fired capacity dominating the power mix with a share of 80.2%.

Inspired by new reserves, the UAE is preparing to invest heavily in hydrogen infrastructure and strives to develop new production techniques. Investors, together with the energy ministry, are cur-

rently choosing new locations for unconventional gas drilling.

Natural gas has been the dominant power source, accounting for around 99.8% of thermal capacity, while oil and coal just contributed 0.1% each.

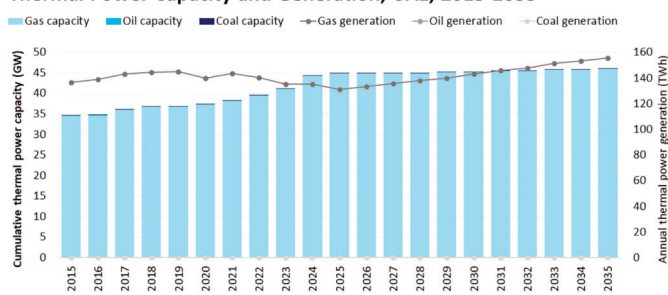
By 2035, Global Data analysts expect cumulative thermal power capacity to increase by 0.9% to 46.1 GW, up from 41.2 GW last year. The actual electricity generation from thermal power sources would then rise from

135.5 TWh currently to 155.9 TWh in 2035, growing at a rate of 1.2%.

"Most of the increase in capacity is expected in gas-based thermal power rather than oil, whose capacity is expected to remain almost unchanged. Gas turbine manufacturers can benefit from this increase in gas-fired power capacity," said Global Data power analyst, Sudeshna Sarmah.

Rapid economic and demographic growth over the past years has, however, UAE's electricity grid to its limits. It may hence become difficult to realise plans to add planning to add nuclear, renewable, and coal-fired electricity generating capacity to accommodate the country's rising electricity demand. ■

Thermal Power Capacity and Generation, UAE, 2015-2035



GlobalData.

Source: GlobalData Power Intelligence Center

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system already underway since early April. Similar work was carried out at Calcasieu Pass, Venture Global's previous LNG export terminal, four months before FERC's approval to introduce hazardous materials on-site, analysts at Energy Aspects pointed out,

suggesting: "Plaquemines would have to move faster with its construction to meet the timeline stated by CEO Michael Sabel of introducing first gas to the facility within 90 days of 18 March."

Plaquemines LNG is forecast to take first gas in June, before ramping up to 0.1 bcf/d of intake by the end of the injection season. Risk abounds to this production forecasts, analysts cautioned, pointing to possible construction delays and the precedent set by Calcasieu Pass whose gas intake did not rise above 0.1 bcf/d until eight months after receiving first gas.

Total US gas demand dwindled during the onset of the shoulder season, with LNG feedgas flows largely rangebound since early April at between 12.5 and 13.1 bcf/d. Freeport has shut down Train 2 on March 20, followed by a shutdown of Train 1 for inspection and repair works that are due completed by early May. Train 3 is currently the only one online and producing LNG at Freeport, limiting feedgas demand to about 0.7 bcf/d – though the operator announced that after maintenance works, Freeport's overall liquefaction capacity will rise by 10%

to just over 16.5 mtpa by June.

On the supply side, market observers await the start-up of the 2.0 bcf/d Mountain Valley Pipeline in Appalachia. Four of nine spread are now complete, with less than two miles of backfilling work to be completed across the remaining five spreads, Energy Aspects understands. "While that remaining work may not be finished in time for mechanical completion by the end of Q1-24 as Equitrans hoped, we anticipate that milestone will be reached early in Q2-24," they commented.

But Mountain Valley Pipeline is unlikely to unlock additional gas production in the Appalachian Basin until winter 2024/25, when local demand helps debottleneck flows on Transco south of Station 165 where MVP connects to the wider system. "Rising heating demand typically allows for up to 0.4 bcf/d of spare capacity on Transco (...) and further production uplift will depend on the progress of MVP Southgate, the extension designed to ferry gas to power plants in North Carolina," analysts noted, though they do not anticipate Southgate will enter service before 2028. ■

Gas to Power Journal

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Singapore teams with JERA to strengthen LNG supply chains

Singapore's Energy Market Authority (EMA) has partnered with Japan's biggest power generator JERA to jointly procure LNG by aligning supply chains. Natural gas is a mainstay in Singapore's energy mix as the city states scales up lower carbon sources, hence EMA seeks to enhance the reliability of gas supply to help facilitate competitively-priced electricity in the energy transition.

The accord fosters mutual cooperation in LNG procurement and optimisation, JERA's chief low carbon fuel officer Ryosuke Tsugaru said, suggesting the accord seeks to establish a more stable, resilient, and cost-efficient fuel supply as Singapore's gas-burn continues to grow.

Electricity consumption in Singapore has been rising steadily, even during the pandemic. Based on EMA's projections, Singapore's peak power demand is expected to grow between 3.4% and 6% annually over the next five years, reaching between 9.3 GW and 11.6 GW by 2028. The regulator is hence awarded YTL PowerSeraya the right to build, own and operate a new hydrogen-ready gas power plant with a capacity of at least 600 MW by the end of 2027.

Setting up a single gas buyer

Turning away from market liberalisation, Singapore is preparing to set up a single buyer of natural gas and LNG for the power

generation sector this year. Trade and industry minister Gan Kim Yong called it a "more deliberate and coordinated" approach after spikes in spot electricity prices exposed weaknesses in the city state's market-driven gas procurement process.

A newly-created single entity will aggregate gas demand from Singapore's power generation companies (gencos) and then import the required gas volumes and sell it onwards to the gencos. Analysts expect the establishment of a single buyer to result in a major change in Singapore's LNG contracting and competitive landscape.

As spot prices remain volatile, industry



LNG carrier berthing in Singapore

players will closely monitor price arbitrage between spot prices and long-term contracts (Brent-linked) on individual cargoes to maximize short-term profits. Wood Mackenzie reckons this could lead to an increase in the number of disputes between buyers and sellers in 2024, which may be one reason for EMA to set up a single buyer in Singapore. ■

Japanese utilities seek to resell LNG surplus as country shift to nuclear

Japan's four largest utilities – JERA, Tokyo Gas, Osaka Gas and Kansai Electric – are over-contracted on LNG by around 11 mtpa, IEEFA analysts reckon, pointing to falling gas-burn as the country shifts to clean energy, notably nuclear power and renewables. Utilities hence seek to re-sell their LNG surplus and look cultivate demand in Asia's emerging markets.

Japan's LNG imports had soared following the 2011 earthquake and Fukushima nuclear disaster which resulted in the shutdown of all nuclear reactors and propelled up LNG demand to 89 million tons by 2014. However, the government's decarbonisation plan aims to lower the use of LNG for power generation by 53% by 2030 to just 187 terawatt-hours (TWh). Analyst expects this could lower LNG demand between 25.7 and 31.6 million tons

per annum (mtpa).

IEEFA, the Institute for Energy Economics and Financial Analysis, see Japanese utilities trying to sell their flexible LNG surplus abroad. "They're trying to cultivate demand by investing in, for example, power plants and city gas distribution companies to develop a market where they can offload their surplus LNG volumes," Sam Reynolds, lead researcher for LNG in Asia, explains.

According to figures from the Japan Oil, Gas and Metals National Corporation (JOGMEC), the volume of LNG sales by Japanese utilities to third countries has risen over 2.5 times from 14.97 million tons in FY2018 to nearly 40 million tons. The volume of LNG sold abroad is now nearly half of the volume consumed by power generators and industry at home.

Going forward, Japanese LNG buyers will aim for

contracts without destination restrictions which gives them greater flexibility to resell excess volumes overseas. Analysts warn, however, that most of Japan's older LNG purchase agreements contain pricing formulas linked to oil benchmark at a relatively steep slope – hence term deliveries can quickly be out-of-the-money at times of falling spot prices. ■



Futtsu LNG regas terminal and power plant at Tokyo Bay

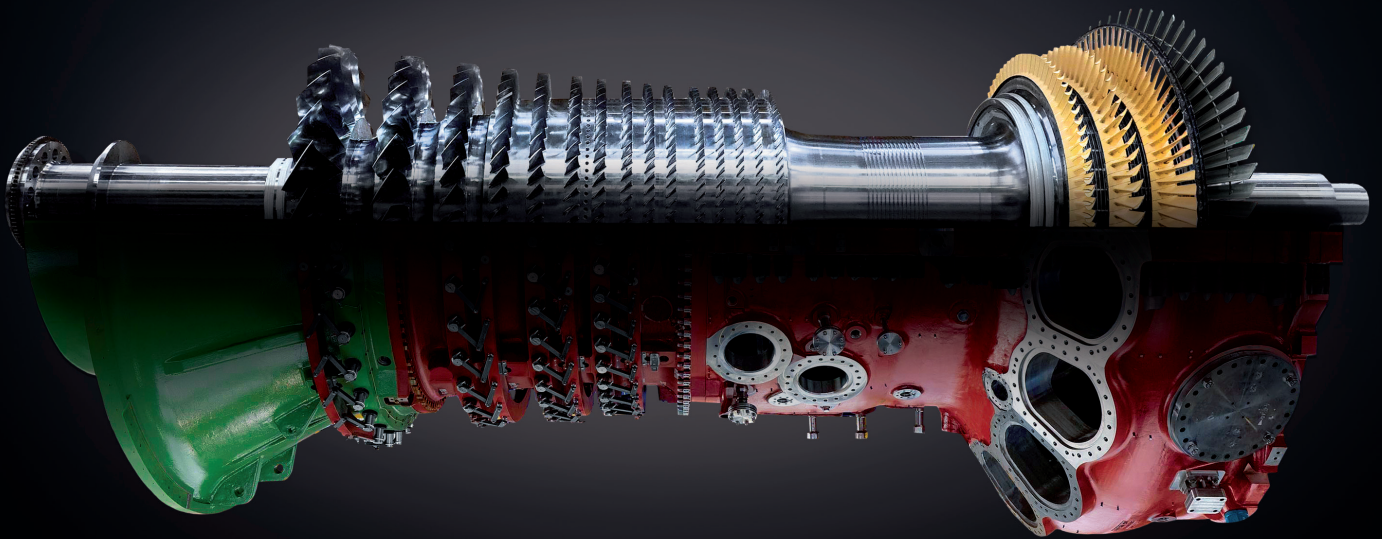
Sumitomo enters India's city gas market

Japan's Sumitomo Corp strives to enter the city gas business in India by making a primary investment in the Singaporean aggregator AG&P LNG Marketing. The target company has stakes in THINK Gas, which supplies seven authorized areas in northcentral India, as well as AG&P Pratham which holds twelve areas in southern India with a combined business area of 325,000 square kilometres. ■

— ITALIAN ENERGY —

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EU energy market overhaul could help bridge €800bn investment gap

Parliamentary approval of the EU electricity market reform will advance 'Contracts for Difference' (CfDs) to encourage private investment into new energy sources – notably renewables and nuclear – and accelerate the grid build-out, hydrogen co-firing carbon capture. Boston Consulting Group estimates the energy infrastructure investment gap amounts to \$800 billion by 2030 and could scale up to €2.5 trillion by 2050.

On power grid investment alone, BCG modelling finds that if investments were to stay at their current rate through 2050, this would leave a 60% funding gap looming large in the target investment gap. Grid spending would have to more than double from current annual levels if the EU wants to facilitate further renewables build-out to reach its target to reduce greenhouse gas emissions by 55% by 2030 and become climate-neutral by 2050.

CfDs for both renewables and nuclear

EU Parliament last Thursday approve the much-awaited 'Contracts for Difference' (CfDs), where by a public authority compensates the energy producer if market prices fall too steeply, but it collects payments from them if prices are too high. The use of CfD is now allowed for "all investments in new electricity production," meaning power-generating facilities based on wind, solar and geothermal energy, hydropower without reservoir – and nuclear

energy.

But to make private capital come forward, there needs to be a stronger Single Market that de-risk grid investment and unlocks flexibility such as energy storage and demand response, the European Round Table for Industry (ERT) finds. To harmonise the European power grid, the lobby ground recommends more cross-border co-operation via transnational PPAs, better harmonisation of technical standards for more interconnection, faster permitting of energy infrastructure and creating demand centres for hydrogen and CO₂.

Fixed-price contracts to protect consumers

Eager to shield consumers against volatile prices, law makers in Strasbourg ensured that they will have the right to access fixed-

price contracts or dynamic price contracts. Suppliers will not be allowed to unilaterally change the terms of a contract, or cut the electricity supply of vulnerable customers.

"Parliament has taken a step forward in democratising energy, creating a market design that responds to the failures exposed by the energy crisis. All consumers, including micro, small, and medium-size enterprises will have access to long-term, affordable and stable prices," said lead MEP Nicolás González Casares.



View into the European Parliament in Strasbourg

Urgent need for flexibility as RES outnumber dispatchable generation

With renewables set to become the world's largest electricity source by 2025, Wärtsilä calls for urgent action to enable more flexibility in power systems. According to IEA projections, the amount of renewables deployed globally will double by 2030 while inflexible generation dwindles, including a 20% fall in coal and 34% drop in oil generation, equating to over 2,300 TWh in lost capacity.

Economics changed greatly over the past decade: "We have transitioned from renewables requiring financial support, to a position where inflexible assets, such as oil, coal and CCGTs (combined-cycle gas

turbines) and nuclear are no longer viable without political support," Anders Lindberg, President of Wärtsilä Energy, pointed out, noting: "This presents us with a unique opportunity: to add more renewable energy than ever before on to our grids, build the right level and right type of flexibility into our power systems and phase out inflexible assets while converting to sustainable fuels."

At COP28, the United Nations Framework Convention on Climate Change (UNFCCC) agreed to transition away from fossil fuels and triple renewable power by 2030. Flexible technologies hence need to

be deployed at scale and pace to support that transition to avoid widespread curtailment, increased prices, greater price fluctuations.

To address the tipping point, policy makers should encourage flexibility through regulations and policies that incentivise investments in

flexible generation assets. Shorter timeframes are needed for trading electricity: Instead of trading in hourly periods, power trading markets should be operating in 15-minute, or even 5-minute, time resolutions, Wärtsilä finds.

According to IEA World Energy Outlook report, gas generation will increase 1% by 2030 and decrease 5% by 2050 as the role gas-fired power plants shifts from providing baseload power to providing flexible and firm capacity for grid balancing.

Inherently wind and solar power is intermittent, so flexible assets are required to manage minute-level, daily and seasonal variations in renewable generation. According to Wärtsilä, engines are the optimal flexible power gen technology choice over aeroderivative turbines in a five-minute market as the can outperform gas turbines when dispatched in real-time markets. One study found that an engine power plant can capture 60% more value than an equivalent aeroderivative gas turbine plant over 20 years.



TVA dedicates three gas units in Kentucky as part of plans to add 3.8 GW

Tennessee Valley Authority has dedicated three gas-fired units at the Paradise Combustion Turbine Plant in Drakesboro, Kentucky. The new units add 750 MW to TVA's generation fleet and are part of the utility's plan to build more than 3,800 MW of new capacity by 2028, based on solar, energy storage, combustion turbines and combined-cycle gas.

The new three simple-cycle units were dedicated at an official event a few days ago, but they already entered commercial operation on December 29, 2023 – just in time for winter weather. Construction at the Drakesboro site began in the autumn of 2021 and finished on schedule and within budget, TVA pointed out.

Capable to ramp up to full power within 11 minutes, the three open-cycle units can provide enough flexible electricity to power 400,000 homes. The new units complement the existing 1,100 MW gas combined-cycle capacity at Drakesboro and come addition to three other combustion turbines that began operating in July last year at the Colbert site in northern Alabama, expanding TVA's capacity by nearly 1,500 MW

combined.

"These units provide the flexibility, responsiveness, and reliability needed to support the power grid," Roger Waldrep, TVA's Vice President of Major Projects said at the dedication event. "They allow us to meet demand during normal loads as well as peak periods, like the extremely cold days we experienced this winter, and the warm days that are ahead this summer."

Going forward, TVA plans to add more than 3,800 MW of generating capacity to the grid by 2028 and Jamie Cook, General Manager of Major Project explained that "many of TVA's new combined-cycle gas turbines are replacing older, less efficient [coal power] units."



Three new units at Paradise plant

Gas turbine synchronized new 800 MW combined-cycle unit in Italy

Ansaldo Energia has synchronized a new gas turbine at EP Produzione's Tavazzano and Montanaso power plant, a crucial step in the commissioning process of the 800 MW combined-cycle gas unit which will cover the electricity demand of over 1.5 million households. The first parallel follows the first ignition of the GT36 gas turbine by a few days.

For the Tavazzano and Montanaso unit, Ansaldo Energia oversaw the entire project as EPC contractor and took care of the full construction of the new unit from foundations to commissioning: the combined-cycle unit consists of a GT36 gas turbine of class H, coupled to a steam turbine and the two related genera-

tors – all entirely made at the Ansaldo factories.

With its unique flexibility, the GT36 turbine can respond to network load requirement while ensuring high performance and minimise emissions into the atmosphere. The turbine is already set up for the combustion of hydrogen, in a mixture of up to 70%.

The new unit enhances the overall efficiency of EP Produzione's power gen assets, allowing for flexible response to compensate for renewables intermittency in the face of Italy's green energy transition. With reference to energy efficiency, Italy's National Integrated Plan for Energy and Climate (PNIEC) sets a target of reducing primary energy consumption by 43% and final energy consumption by 39.7% (compared to the 2007 reference scenario) by 2030.



Tavazzano and Montanaso power plant

Kentucky utilities order GE7HA turbine for Mill Creek Generating Station

Louisville Gas and Electric and Kentucky Utilities, two regulated utilities that are part of PPL Group, have ordered GE 7HA.03 combined-cycle equipment to power a new gas-fired unit at their existing Mill Creek Generating Station. The regulator approved plans to retire two coal units and build a new 645 MW combined-cycle gas unit, due completed by 2027.

In addition to the new CCGT, the regulator also approved solar energy projects, battery storage, and a suite of energy efficiency programs that will make the overall Mill Creek complex more environmentally sustainable.

The New Mill Creek Unit 5 will be built by TIC – The Industrial Company, a subsidiary of Kiewit. It will feature a GE Vernova 7HA.03 gas turbine, initially fuelled by natural gas but capable to utilize up to 50% hydrogen (by volume) when the clean-burning fuel becomes more available. GE will also provide a STF-D650 steam turbine along with a W86 generator, a Vogt Heat Recovery Steam Generator (HRSG) and its integrated Mark* VIe control system.

HA gas turbines produce less than one-third of the carbon emissions of a similar coal-fired generating station, the manufacturer pointed out, adding the performance of the new 7HA.03 gas turbine includes a highly flexible ramp rate of 75MW/min.

Once operational in 2027, data collected from sensors throughout the power plant will be analysed at GE Vernova's Monitoring & Diagnostics (M&D) Center in Atlanta to optimise the plant's performance.

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