



Gas-burn in India soars 62% in the second quarter, lifting LNG imports

Power generation in India from gas-fired plants has risen by nearly 62.5% in the quarter ending June, as rising demand for peaking power pushed up the load factor for these plants to 24.5%, compared with 15.3% in the first quarter, data from the Central Electricity Authority shows. LNG imports consequently increased 11% to 2.648 million standard cubic meters (mmscm).

Indian power producers and industry consumed some 5.594 mmscm of natural gas in June, compared with just 5.224 mmscm in the same month last year. The cost for importing gas jumped by 10% to \$1.1 billion in June when India was hit by sweltering heatwaves. But LNG imports already increased 6.2% in the first quarter, with import bills amounting to \$3.4 billion.

Prolonged heatwaves in the northern part of the country made electricity demand surge 22% in June. The government hence mandated utilities to operate all their gas-fired power stations at full capacity until June 30.

In the coming months, LNG imports and gas demand hinges on



Adani Total's Dharam LNG terminal

how the weather evolves, though demand from fertiliser industries and manufacturers keeps rising regardless, analyst noted.

Blending LNG with domestic gas could make electricity cheaper

The Indian government is considering allocating more domestic gas for power generation and allowing to blend LNG with domestic fuel

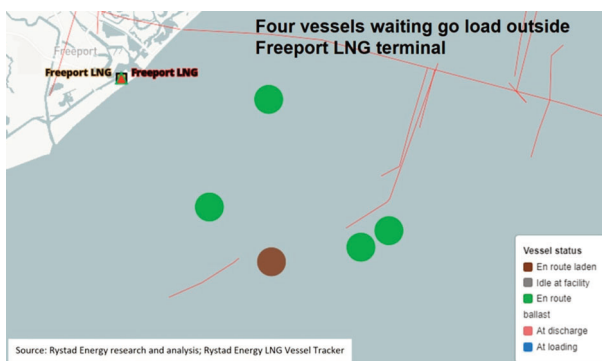
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Delay of full Freeport LNG restart leaves four vessels waiting to load

Four LNG tankers are waiting to load just outside the Freeport liquefaction terminal, Rystad's vessel tracker shows, as the facility's longer-than-expected closure impacts markets in Europe and Asia. The benchmark TTF price in Europe gained 4.67% week-on-week to nearly €32.8/MWh while Asia's spot LNG price jumped 6.3% to \$12.3 per million British thermal units (MMBtu).

“Freeport LNG is under the spotlight again with uncertainty regarding its full resumption,” said Rystad Energy's vice president Wei Xiong, drawing a parallel with the terminal's the ten-month closure after an explosion in 2022. “Although its impact on prices is not expected to be long lasting [this time round],” Wei told global market participants to “still be vigilant about potential supply disruptions.”

On Monday, the Freeport terminal reinstated about half of its liquification capacity and the Bermuda-flagged Gaslog Wales was seen loading.



One Train is now in operation.

Uncertainty abounds, however, about the timeline of the resumption of another two trains.

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to make gas-burn more affordable. Counting the costs, the ministry revealed that LNG cargoes for May delivery were priced at around \$1.1 billion – less than the \$1.8 billion Indian buyers paid in May 2023, but substantially more expensive than domestically produced gas.

Utilities hence urged the ministry to allocate more domestic fuel for power generation and blend it with some LNG to keep the costs down as peak power demand spiralled in the unabating summer heat. Domestic gas production in May amounted to 3.105 bcm, some 6.7% higher than the 2.909 bcm measured in May 2023. Utilisation rates at

India's LNG import terminals, meanwhile, are in decline as more regas infrastructure is being put in place.

Peak power demand to top 350 GW

LNG will be vital to complement domestic gas output as India's peak power demand will likely exceed 350 GW by 2030, according to government forecasts. Electricity demand has been rising over the past few years on the back of urbanisation, increasing industrial activity and erratic weather patterns.

Since the economic recovery started after the Covid-lockdowns, India's electricity de-

mand increased and reached a high of 240 GW in the fiscal year 2023/24. Peak demand jumped by nearly 150% during this period and for June and July, government forecasts peak demand at 240 GW during the daytime and 235 GW in the evening.

To mitigate the risk of blackouts and meet immediate peak power demand, „the government is shifting the planned maintenance of power plants to the monsoon season, expediting capacity additions and reducing partial outages of thermal power plants,” explained Purv Jain, analyst at the Institute of Energy Economics and Financial Analysis (IEEFA). ■

World electricity use in 2024/25 set to grow faster

Robust economic growth, intense heatwaves and electrification will make the world's electricity demand rise by 4% over the 2024/25 period – more than global GDP growth at 3.2%. According to the International Energy Agency (IEA), growth is primarily driven by electrification in China, India and the United States, not least due to the AI boom and rapid data centres build-out.

India – the world's fastest growing major economy – is forecast to stage an 8% growth in electricity consumption in 2024, matching last year's rapid growth. This comes amid strong GDP growth and rising cooling demand. In the first half of 2024, the country grappled with heatwaves of record duration, whereby peak-load reached a new high and put exceptional strains on power systems. If the weather returns to more normal conditions, analysts expect electricity demand

growth in India to ease moderately to 6.8% in 2025.

China's electricity demand is forecast to soar 6.5% this year, which is actually a “modest slowdown” from 7% in 2023 amidst the ongoing restructuring of the Chinese economy: Electricity consumption in China is driven by the rise in services industries and rising production of solar PV modules, electric vehicles and batteries along with the energy-intensive processing of related raw materials.

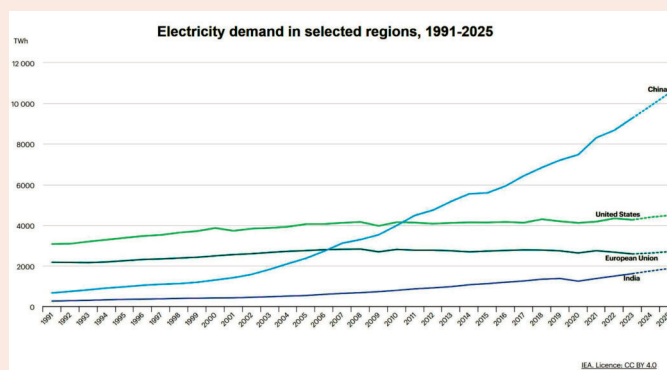
“Over the last three years, China has been adding electricity demand roughly equivalent to that of Germany each year, on average,” IEA analysts pointed out and this trend will likely continue through 2025, with growth forecast at 6.2%.

Over in the US, electricity demand is

propelled up heatwaves, an improved economic outlook and especially the surge in data centre expansions. Demand is forecast to rise 3% year-on-year in 2024, and then slow to a 1.9% growth rate in 2025. The rise of artificial intelligence (AI) make better stocktaking of power gen capacity more important than ever, analysts stressed. But in many regions, historical estimates of data centres' electricity consumption are hampered by a lack of reliable data.

Declining output from energy-intensive industries in the EU has made electricity consumption contract over the past two years. In 2024, demand is expected to increase by 1.7% as economic difficulties ease and energy prices stabilised during the first half of this year. Various industries

that had previously curtailed operations restarted but the IEA warned energy prices in Europe are still elevated compared with pre-Covid levels, which weighs on some industries and raises uncertainties over the pace of the demand recovery. ■



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Feedgas flows to Freeport LNG were last seen at minimal levels of only 8.7 million cubic feet per day (Mcf/d), compared to nearly 2 billion cubic feet per day (Bcf/d) before the hurricane's arrival.

Considering the terminals 10-month shutdown until the first quarter of 2023 due to an explosion, and other noticeable outages,

Freeport LNG incurred nearly 9 million tonnes, 2.9 mt, and 3.2 mt of production losses occurred in 2022, 2023 and 2024 year to date. Wei warned that “given its record of impacts, the prolonged restart this time and uncertainty about its full resumption, have raised fresh concerns over US LNG supply risk.” ■

End of Ukraine gas transit heralds LNG and pipeline diversions

Ukraine's refusal to extend a gas transit agreement with Gazprom impacts Europe, considering 13.7 bcm of Russian pipeline gas were delivered last year. The transit deal will expire at the end of 2024 and Rystad Energy reckons an additional 7.2 bcm per year of LNG will be needed to cover the shortfall, partly sourced via the new Vertical Gas Corridor.

Austria's incumbent gas utility OMV had already issued a warning in May, saying supply disruptions may occur sooner than initially expected. Slovakia, Austria and Moldova are the European nations most dependent on transit volumes, importing about 3.2 Bcm, 5.7 Bcm and 2.0 Bcm in 2023, respectively. Italy's energy company Eni and Hungary also imported Russian gas through Ukraine, while Slovenia and Croatia have been smaller takers, explained Christoph Halser, Rystad's Gas & LNG analyst.

Bracing for a halt in Ukraine gas transits, Central and Eastern European created a Vertical Gas Corridor that uses existing infrastructure in Ukraine and Moldova and enables LNG imports from Greece and Turkey to reach Slovakia, Hungary and possibly Poland. In addition, Turkey's TSO Botas and Bulgartansgas have increased capacity at the Strandzha 1 entry point, allowing for larger flows from the Caspian Sea region into Europe. "This expansion could boost Azeri gas exports to Europe from 13 Bcm to 20 Bcm per year by 2027," Halser commented and, "in the long run, potentially transport Iranian gas through the Solidarity Ring Initiative."

Pivot to Moldovan transits or Vertical Gas Corridor

Russian gas transiting Ukraine in 2023 reached Europe via entry points in Slovakia and Moldova. Now, Moldova strives to revise

upwards its supply having agreed with Ukraine on continuous flow of Russian gas until the end of 2025. Alternatively, European buyers could source gas from Azerbaijan and the Caspian Sea region via Turkey and Bulgaria. This so-called Vertical Gas Corridor is meant to be expanded from 13 Bcm to 20 Bcm per year by 2027.

"Gazprom and European importers are keen on continuous supplies via Ukraine, while Ukrainian officials deny any intention for a renewed agreement with Russia. Without Azerbaijan or another third party transiting the gas following a swap deal with Russia, the EU will require about 7.2 Bcm of gas to be sourced from the LNG market," he said. Terminals in Poland, Germany, Lithuania and Italy, in his view are best placed to forward these volumes to the most affected counties, notably Slovakia and Austria.

Modelling of 0% flow of gas via Ukraine would Austria – the largest offtaker of Russian gas in 2023 – strive to boost imports Germany via the Oberkappel entry point, which Rystad then expects to run at a maximum annual capacity of 8 Bcm. "But flows via Oberkappels will not be sufficient to close the 8.53 Bcm import gap," Halser warned, suggesting gas transits to Hungary would have to decline and outflows to Italy would stop. "If all Russian gas flows via Ukraine were to cease, Austria would need to import up to 2.5 Bcm from Italy via the Arnoldstein-Tarvisio crossing point," he noted.

Italy, meanwhile, has options to replace

Russian gas pipelines and has largely achieved independence from the Ukrainian transit. But the country still sources some 3.75 Bcm for Slovakia and Austria which could be replaced by LNG via the Ravenna floating storage and regasification unit (FSRU) – 5 Bcm per year from 2025 – and 1.23 Bcm from pipeline supplies through Tunisia.



Azerbaijan vows to raise gas exports to Europe to 20 bcm/y

Azerbaijan's President Ilham Aliyev has promised the country will raise natural gas exports to the European Union this year to 13 billion cubic meters and 20 bcm/y potentially by 2027. Expiry of gas transit agreement through Ukraine in December could cause a shortfall in Europe, given that 13.7 bcm of Russian pipeline gas were delivered last year via that route.

The EU last year imported 11.8 bcm of Azeri gas after it signed a deal following Russia's invasion of Ukraine in 2022 to double imports. President Aliyev cautioned that both infrastructure and financing was not yet in place to allow the expansion, but vowed Azeri utilities would be committed to reach the target. From January to March, Azerbaijan exported a remarkable 3.2 bcm of gas to Europe – surpassing earlier projections.

Alternative gas supplies for the EU, notably from Azerbaijan and the wider Caspian Sea region, have come into focus as Kiev refuses to extend a gas transit agreement for Russian gas to southeast Europe. "Without Azerbaijan or another third party transiting the gas following a swap deal with Russia, the EU could require about 7.2 Bcm of gas from the LNG market."

Alternative supply: the Vertical Gas Corridor*



*Capacity estimates according to Gas Transmission System Operator of Ukraine (GTSOU)

Girada works with Black & Veatch to convert biomass into syngas

Dutch clean energy tech firm Girada Energy has teamed up with Black & Veatch to implement and commercialise its technology that converts waste into synthesis gas. The project uses Girada's patented High-Temperature Winkler gasifier – capable to produce methanol, hydrogen or methane – while Black & Veatch will contribute its robust EPC project delivery solutions.

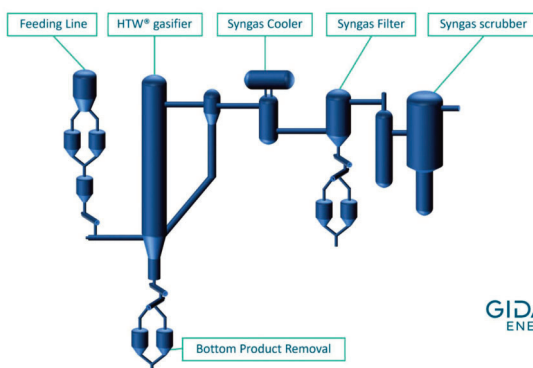
By combining proven HWW technology and Black & Veatch's engineering excellence, Girada Energy wants to offer "compelling technological propositions to clients seeking to repurpose waste into valuable molecules," said CEO Dr. Norbert Kamp.

Power generators and energy-intensive industries increasingly embrace alternative fuels and feedstock, hence Black & Veatch strives to "leverage innovation that brings about greater sustainability, in this case by turning waste into a lower-carbon fuel," said Brady Hays, head of Black & Veatch's fuels and natural resources sector.

HTW technology, a fluidised-bed gasification process, is a proven technology developed in 1926 by Rheinbraun in Germany. Girada adapted the method to utilise diverse

waste streams as feedstock. The HTW system consists of a gasifier and a cyclone with a gravity return pipe, used for converting feedstock to syngas. Due to the pressure in the gasifier, both the feeding system, as well as the bottom ash and dust removal, have to be performed by lock-hopper systems. With the aid of the gasification agents, i.e. oxygen (O₂) and steam (H₂O), the biomass-derived material is converted in the gasifier to the raw syngas.

Of the 40 Winkler gasifiers built since 1926, just 7 use the novel HTW technology – hence there is ample scope for commercialisation. The most notable references



Scheme of Girada's HTW process

built after 1970 include a waste-to-methanol plant in Berrenrath, Germany, a peat-to-ammonia plant in Oulu, Finland, an MSW-to-syngas combined heat and power plant in Niihama, Japan, and a biomass-to-syngas plant at TU Darmstadt, Germany. ■

New cathode synthesis methods promise faster production times

Advancement in Li-ion batteries have centred around optimising cathode materials, but new manufacturing and synthesis methods promise faster production times as well as lower water and energy consumption, Dr Alex Holland, Research Director at IDTechEx finds. Such innovations are vital considering global Li-ion battery demand is forecast to grow at an annual rate of 16.7% through to 2034.

Cathode material has for long been at the centre of researchers' attention, namely NMC (Nickel Manganese Cobalt Oxide) and NCA (Nickel Cobalt Aluminium Oxide). These cathodes are the source of cobalt within Li-ion batteries and contribute over 60% of the cost of manufacturing an NMC cell in 2022, when material prices peaked.

Cobalt has been steadily reduced in NMC and NCA-type cathodes due to cost considerations and human rights concerns, given that much of used metal was sourced from the Democratic Republic of Congo. Companies are now commercializing ultra-high nickel layered oxides, with nickel contents approaching and even surpassing 90%,

Holland pointed out.

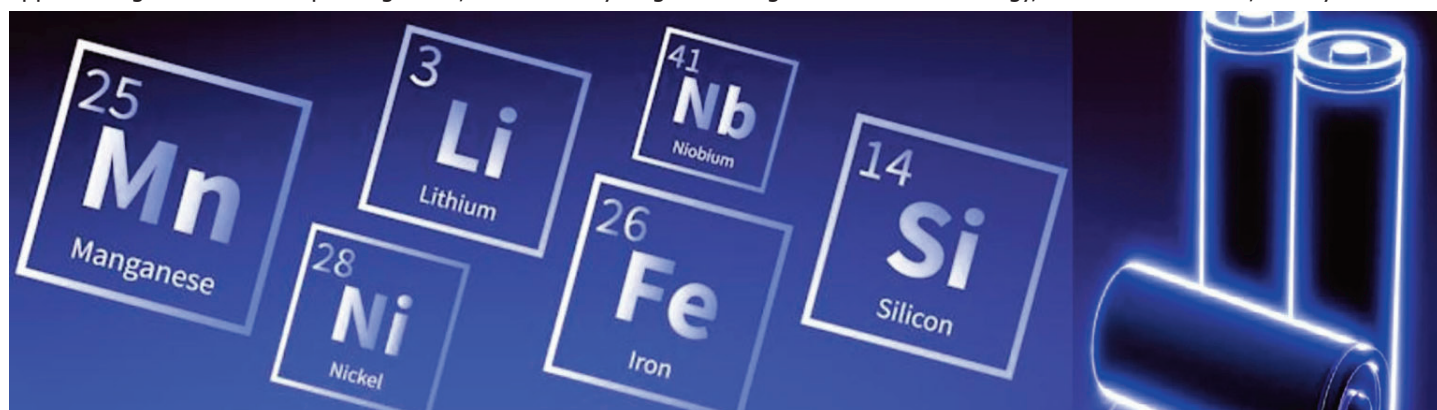
Optimizing electrolyte, cell, and battery pack design has also been crucial in maximizing the performance of more affordable LMFP (Lithium Manganese Iron Phosphate) batteries. "Incorporating manganese into the cathode to achieve a higher average voltage, which can boost energy density by 10-20%," he explained, stressing that LMFP batteries can hence reduce the total amount of material needed per kWh of battery.

Pioneers of cathode synthesis methods

Beyond material innovation, new cathode manufacturing and synthesis methods are in the early stages of being commercialized.

"These approaches promise faster production times, lower water and energy consumption, with the added benefit of enabling the use of lower-cost precursors," Holland said. They can also eliminate the sulfate waste streams that are increasingly scrutinized in regions with strict environmental legislation.

While alternative synthesis methods have garnered interest, conventional methods using co-precipitation and solid-state synthesis still dominate global cathode production. "Still, several companies, primarily based in North America, are leading a shift towards alternative cathode production practices," he stressed, pointing at examples like 6K Energy, Nano One Materials, and Sylvatech. ■



PJM recommends co-locating data centers with nuclear power plant

To cater for data centers' high electricity demand, PJM Interconnection recommends co-locating them with nuclear power plants to reduce the need for additional transmission lines. Expansion of traditional and AI data centers, along with chip foundries, is expected to increase US power demand by 177 TWh from today's level through to 2030, reaching a total of 307 TWh.

In absolute terms, the growth in electricity demand from EVs and data centers is equivalent to the total electricity demand of a country like Turkey, that the US has to take on. Utilities need to embark on a race against time to expand their power generation without overwhelming electricity systems to the point of stress.

In 'The Co-Located Load Solution' study, PJM's former chief operating officer Michael Kormos seek to avoid potential long inter-connection delays and strain on existing grids. Operators of data centers are urged to buy their electricity directly from some of the US largest power producers. "By not taking service from the transmission grid,

the new load expedites the timeline but must pay for its behind-the-meter delivery facilities and assume the costs and risks of not being served by the grid," he stated in the report.

Exelon and American Electric Power (AEP) raised protest against a proposal that seeks to build an Amazon Web Services (AWS) data center directly next to Talen Energy's Susquehanna nuclear plant in north-east Pennsylvania. The claimants say the co-location could levy unfair cost burdens on ratepayers and negatively impact the reliability of the wider electricity supply for other off-takers in the region. ■



Data center next to Susquehanna nuke

Doosan bags over 1 trillion Won worth of gas turbines orders

South Korean manufacturer Doosan Enerbility has surpassed 1 trillion Won (\$719,83 million) in orders within just one year for the service, and construction of K-gas turbines. This week, a 580 billion Won contract was signed with Korea Midland Power for EPC and equipment supply for the Haman combined-cycle power plant which is due completed by 2027.

For the Haman CCGT project, Doosan will be responsible for engineering, procurement and construction as well as for supply of the main equipment, notably a 380 MW gas turbine and a steam turbine.

At the beginning of July, the Korean manufacturer secured a large equipment supply contract for the Bundang CCGT with Korea South-East Power and on July 10, the company signed a long-term maintenance service contract for Unit 2 of the Andong CCGT with Korea Southern Power.

"It's highly significant that Korea Midland Power Co., Ltd., which introduced the 380MW K-gas turbine last year, has chosen K-gas turbines again for related construction projects," said Hyunho Lee, head of the Plant EPC business group at Doosan Enerbility. "With this contract, our capabilities in both power plant construction and main equipment production have been recognized, and we will enhance our competitiveness in the global power generation market." ■

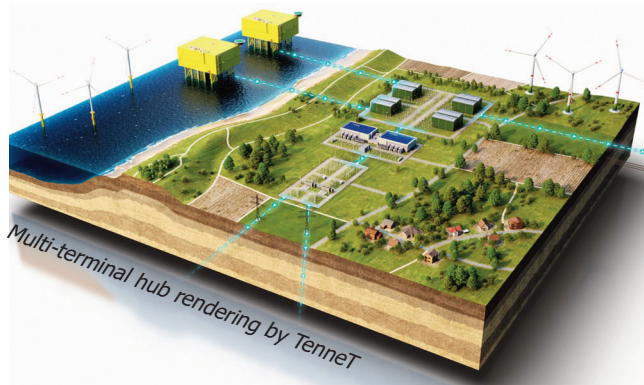


GE Vernova to develop HVDC technology for four German TSOs

Germany's four major transmission system operators - TenneT, 50Hertz, Amprion and Transnet BW – have handed a R&D contract to GE Vernova to design an engineer a multi-terminal High-Voltage Direct Current (HVDC) connector to better integrate renewables. The contract includes a novel 525 kV Direct Current Circuit Breaker (DCCB) that will allow TSOs to trip and isolate faults.

Nearly 60% of all electricity fed into the German grid in the first three months of 2024 came from renewable energy sources, data from country's statistical office Destatis shows. "The north of Germany is a leader in generating wind energy. With multi-terminal hubs in Schleswig-Holstein and Lower Saxony, we as TSOs lay the foundation for more distributing very large quantities of wind power – generated at zero operating costs – from the North Sea coast to centres of demand," said TenneT's head of DC MultiHub program, Dr Benjamin Hühnerbein.

HVDC is the most efficient way to transmit bulk power over long distances. Today's systems are point-to-point, or bi-directional, with HVDC converter station at each end. By developing multi-terminal HVDC technology, GE Vernova and the four German TSOs will



create a system where multiple terminals can connect with one another to facilitate electricity to travel where needed. The American manufacturer is still in the development phase of direct current circuit breaker (DCCB), which will likely be tested in Germany as part of the project before being commercialised.

The initial R&D award covers an 18-month design phase through December 2025. The implementation phase is scheduled to begin in 2026, with a view to start commercial deployment by 2029. ■

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